

PUBLIC UTILITIES COMMISSION

STATE OF HAWAII

REPORT TO THE 2014 LEGISLATURE

ON

HAWAII'S ENERGY EFFICIENCY PORTFOLIO STANDARD

ISSUED PURSUANT TO

SECTION 269-96, HAWAII REVISED STATUTES

December 2013

Executive Summary

In 2008, the State of Hawaii (“State”) partnered with the US Department of Energy to establish the Hawaii Clean Energy Initiative (“HCEI”), with a goal of meeting 70% of the State’s energy needs through renewable energy and energy efficiency by 2030.

The Hawaii State Legislature (“Legislature”) subsequently passed Act 155, Session Laws of Hawaii 2009 (“Act 155”), codified under section 269-96, Hawaii Revised Statutes (“HRS”), which established the State’s energy efficiency goals into an Energy Efficiency Portfolio Standard (“EEPS”). As specified in HRS § 269-96, the statewide EEPS goal is 4,300 gigawatt-hours (“GWh”) of electricity savings by 2030.

This Report is respectfully submitted by the Hawaii Public Utilities Commission (“Commission”) in advance of the 2014 Legislative Session, pursuant to HRS § 269-96.

Key findings of this Report include:

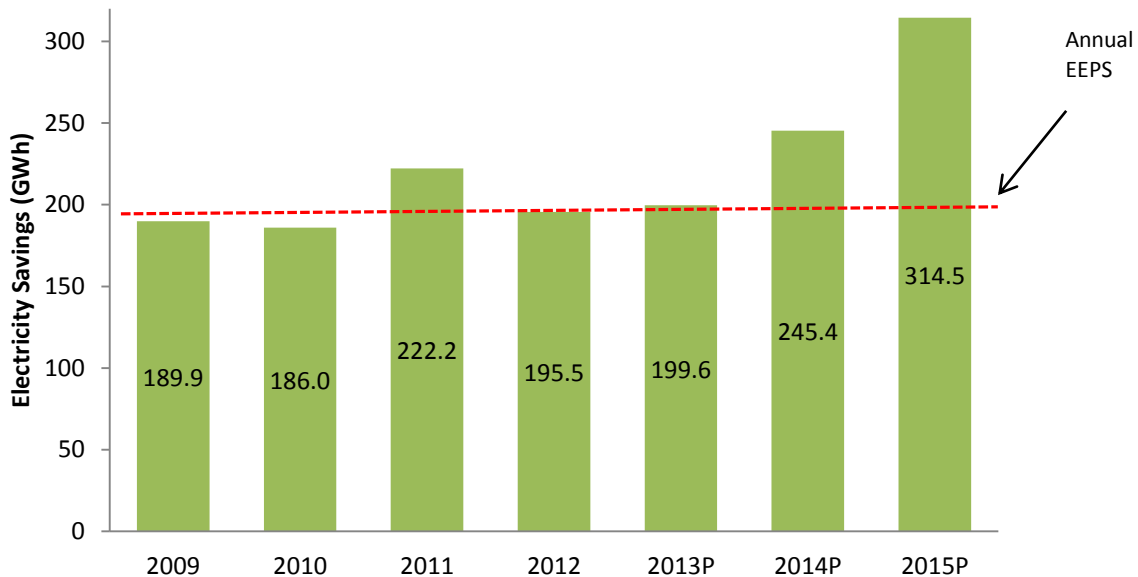
- The EEPS goal has proven effective at accelerating deployment of energy efficiency resources throughout the State. An estimated 794 GWh of electricity savings have been achieved statewide since the EEPS law took effect in 2009.
- While there is uncertainty about energy efficiency savings for future years, Hawaii is on track to achieve more than 1,550 GWh in savings by 2015, exceeding the interim 2015 EEPS target of 1,375 GWh by more than 12%.
- Hawaii Energy, the ratepayer-funded energy efficiency services provider, is an essential component of the State’s efforts to capture untapped energy efficiency resources, having contributed more than 80% of energy savings achieved since 2009.
- The long-term EEPS goal remains achievable. The cost-effective energy efficiency resource available statewide by 2030 exceeds the EEPS goal by nearly 50%. Energy efficiency remains a lower cost resource than most supply-side energy options, and provides many other important benefits to Hawaii’s electric utilities and ratepayers.

Current Progress to Achieving the 2015 Interim Target

In accordance with HRS § 269-96, the Commission developed a framework (“EEPS Framework”) to govern the achievement of the EEPS goal with four interim reporting periods, the first of which will be completed in 2015.¹

The interim target for the first reporting period (2009-2015) is 1,375 GWh in cumulative energy savings. This has been divided into an annual target of approximately 196.5 GWh in each year of the reporting period. Figure 1 shows the progress towards achieving the yearly target.

Figure 1. Annual Energy Efficiency Accomplishments, Statewide



Note: 2013-2015 accomplishments projected based on estimates of future savings from major contributors.

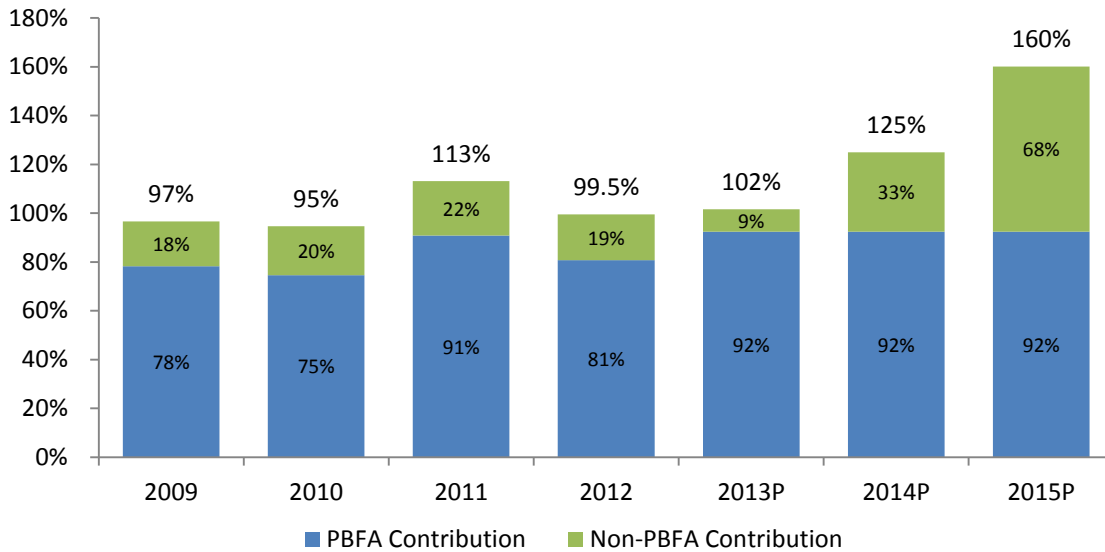
As was discussed extensively during development of the EEPS Framework, many significant contributors to energy savings are not regulated utilities subject to the jurisdiction of the Commission. Furthermore, data collection and reporting challenges prevent a comprehensive accounting of all energy efficiency savings applicable under the EEPS Framework that have been achieved since 2008. Despite uncertainty about some efficiency savings estimates, the State is on track to meet the 2015 interim target.

¹The EEPS Framework was approved by the Commission in Decision and Order No. 30089, issued on January 3, 2012 in Docket No. 2010-0037.

Performance of Hawaii Energy

Hawaii Energy is a ratepayer-funded energy efficiency program serving the islands of Hawaii, Maui, Lanai, Molokai, and Oahu.² The program is designed and implemented by the Public Benefits Fee Administrator (“PBFA”) under contract to the Commission. The current administrator is Leidos Engineering, LLC (formerly SAIC Energy, Environment & Infrastructure, LLC) and the PBFA contract continues until 2015 with an option to extend into 2016.

Figure 2. PBFA Contribution to Achievement of Annual EEPS Targets



Note: Future years projected based on estimates of energy savings from major contributors.

Over the first four years of the program, the incentives and services provided by Hawaii Energy have saved over 637 GWh and been delivered at a cost far below the avoided cost of electricity generation. The total resource benefit of the Hawaii Energy’s first four program years is nearly \$500 million, with lifetime customer bill savings exceeding \$1.5 billion.³ As shown in Figure 2, these programs have provided the bulk of the energy savings applicable to the State’s EEPS goal.

² Kauai Island Utility Cooperative (“KIUC”) implements its own energy efficiency programs for its customers.

³ Total Resource Benefit is the present value of avoided utility costs over the life of the efficiency measures installed through the program. Customer bill savings are reported by the PBFA as undiscounted customer savings over the life of the

Achieving the State’s Long-Term Energy Efficiency Potential

In accordance with the EEPS Framework, the Commission has initiated a statewide energy efficiency potential study intended to aid the Commission and other stakeholders in evaluating the long-term achievability of the EEPS goal.⁴ The study provides an estimate of the total statewide potential energy savings that has not already been captured.

Figure 3. Energy Efficiency Potential, Statewide (GWh)

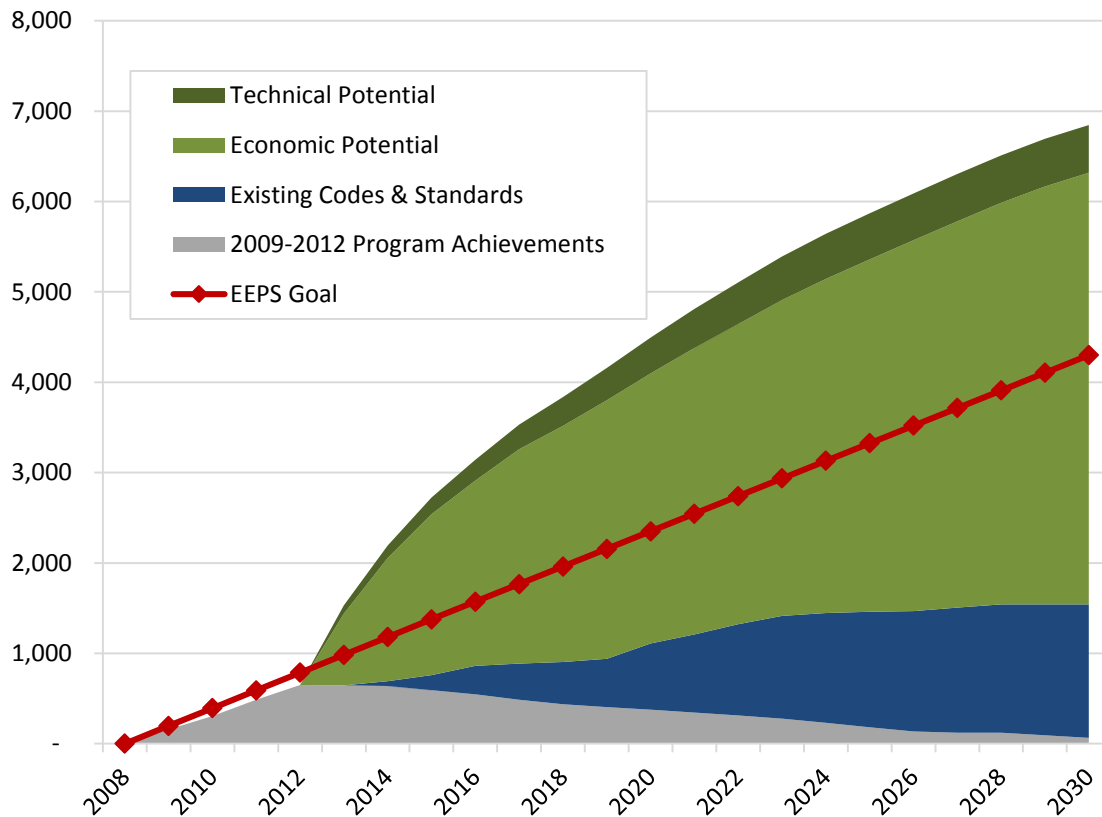


Figure 3 (above) shows the estimated untapped energy savings available statewide. The Energy Efficiency Potential Study demonstrates that cost-effective

efficiency measures based on the prevailing retail electricity rate at the end of each program year. Both of these measures exclude any benefits derived by free-riders on the program.

⁴The latest draft of the State of Hawaii Energy Efficiency Potential Study was completed December 11, 2013. The draft is under review by the Commission and will be finalized and released in January 2014.

energy efficiency potential is substantial and exceeds the statutory EEPS goal. This suggests the State's EEPS goal is achievable.

Findings and Conclusions

The Commission is aggressively pursuing energy efficiency as a valuable and under-utilized resource in the State's energy portfolio. As the performance of Hawaii Energy demonstrates, demand-side resources such as energy efficiency can provide significant benefits to ratepayers that far exceed the cost of providing the programs and services. Furthermore, the 2013 Energy Efficiency Potential Study indicates that there is substantial untapped energy efficiency resource available throughout the State.

In addition, energy efficiency provides many other important benefits to Hawaii's utilities and ratepayers, including reduction in the utilization of the grid (which can reduce utility capital and maintenance expenses), energy savings that persist for many years, peak demand reduction (lower requirements for generating capacity), reductions in the cost of compliance with environmental regulations, improvements in the ability to integrate variable renewable resources into the existing power system, and reductions in overall electricity sales that contribute to meeting the State's Renewable Portfolio Standards ("RPS"). Furthermore, Hawaii Energy has several programs specifically targeted to provide savings to low-income ratepayers, renters, and other "hard to reach" customers.⁵

Based on the current performance of Hawaii Energy, the energy efficiency contributions of other key stakeholders, and the results of the latest Energy Efficiency Potential Study, the Commission has determined the EEPS goal remains effective and achievable.

The results of the statewide Energy Efficiency Potential Study provide new data and analysis relevant to both the design of programs and services administered by the PBFA, as well as the overall implementation of the EEPS Framework. Accordingly, the Commission will convene a meeting of the EEPS Technical Working Group in January 2014 to review the results of the statewide Energy Efficiency Potential Study and to consider the following questions:

⁵In addition, the Commission expects to launch an on-bill financing program in early 2014 that is anticipated to further assist "hard to reach" customers in obtaining the benefits of energy efficiency technologies via low-cost financing and a convenient repayment mechanism through their respective existing utility bills.

- Whether the Commission should adjust the overall EEPS goal (4,300 GWh).
- Whether the Commission should establish targets, incentives, or penalties for energy savings performance by contributing entities or for individual islands/utility service territories (in addition to those already in place for Hawaii Energy, which is administered under contract with the Commission).
- Whether the Commission should adjust the amount of ratepayer funds that are collected and allocated to energy efficiency programs through the Public Benefits Fee.
- How the design and implementation of Hawaii Energy's programs and services should be modified based on the results of the Energy Efficiency Potential Study.
- Whether Hawaii Energy's responsibilities should be expanded to include providing energy efficiency services to customers on Kauai.
- Whether recommendations should be made to the Legislature to encourage energy efficiency achievement, measurement, and reporting of savings by non-regulated contributing entities in compliance with HRS § 269-96, as well as ensuring energy savings potential attributable to building codes and appliance standards are be measured and reported to the Commission.

While the Commission does not believe that legislative action is necessary at this time, the Commission continues to monitor the achievement of the EEPS goal on an ongoing basis. The Commission will consider the input of the EEPS Technical Working Group on the issues identified above, and may determine an adjustment is warranted to the guidelines and requirements of the EEPS Framework and may recommend specific legislative proposals for the 2015 Legislative Session.

Pursuant to HRS § 269-96, the next report to the Legislature on the status of the State's Energy Efficiency Portfolio Standard will be submitted in advance of the 2019 Legislative Session.

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I. Hawaii's Energy Efficiency Portfolio Standard

Energy efficiency is a means of using less energy to provide the same (or greater) level of energy services. Hawaii's EEPS is a statutory requirement to achieve an aggressive, long-term energy efficiency goal over time. Hawaii's EEPS law is similar in concept to Hawaii's RPS, which requires electric utilities to acquire increasing levels of energy from renewable resources by certain deadlines. Where the RPS targets are focused on the supply or generation of electricity, the EEPS targets are focused on reductions in the demand or consumption of electricity.⁶

Act 155 (2009)

In January 2008, the State and the United States Department of Energy established a long-term partnership with the purpose of transforming the way in which renewable and energy efficiency resources are planned and used in the State. This partnership, referred to as the HCEI, set a goal for the state to meet 70% of its energy needs by 2030 through clean energy, with 30% coming from energy efficiency measures, and 40% coming from locally-generated renewable sources.

Subsequently, the Legislature enacted Act 155, codified as HRS § 269-96, which provides:

- a) The public utilities commission shall establish energy-efficiency portfolio standards that will maximize cost-effective energy-efficiency programs and technologies.
- b) The energy-efficiency portfolio standards shall be designed to achieve four thousand three hundred gigawatt hours of electricity use reductions statewide by 2030; provided that the commission shall establish interim goals for electricity use reduction to be achieved by 2015, 2020, and 2025 and may also adjust the 2030 standard by rule or order to maximize cost-effective energy-efficiency programs and technologies.

⁶Hawaii's RPS (codified as HRS §§ 269-91 – 269-95) establishes the following percentages of renewable energy that must comprise net electricity sales: (1) 10% by 2010; (2) 15% by 2015; (3) 25% by 2025; and (4) 40% by 2030.

- c) The commission may establish incentives and penalties based on performance in achieving the energy-efficiency portfolio standards by rule or order.
- d) The public utilities commission shall evaluate the energy-efficiency portfolio standard every five years, beginning in 2013, and may revise the standard, based on the best information available at the time, to determine if the energy-efficiency portfolio standard established by this section remains effective and achievable. The commission shall report its findings and revisions to the energy-efficiency portfolio standard, based on its own studies and other information, to the legislature no later than twenty days before the convening of the regular session of 2014, and every five years thereafter.
- e) Beginning in 2015, electric energy savings brought about by the use of renewable displacement or off-set technologies, including solar water heating and seawater air conditioning district cooling systems, shall count toward this standard.

Development of the EEPS Framework

Pursuant to HRS § 269-96, on March 8, 2010, the Commission opened Docket No. 2010-0037 to establish a stakeholder-based process to develop and implement a framework for achieving the State's EEPS goal. The purpose of the EEPS Framework is to set forth broad principles and strategies for achieving the EEPS goal and to establish interim targets that will set the course for achieving the 2030 standard.

The parties to Docket No. 2010-0037 consisted of key stakeholders, including the PBFA, the electric utilities, government agencies, and industry and advocacy groups. The parties held informal exchanges and workshops through 2010, followed by more formal information requests and filings before the Commission in 2011. The Commission hired a consultant to assist the parties with further discussions and technical sessions, which resulted in a proposed EEPS Framework for review and comment by the parties. After revisions, the Commission approved the EEPS Framework in Decision and Order No. 30089 on January 3, 2012.

At the time of approval, the Commission acknowledged the inherent challenges in developing interim targets for a relatively new program with a statutory goal set for

2030. One important consideration is the need for adequate data and analysis of statewide energy efficiency potential on which to base interim targets and for allocating responsibilities for achievement. Another important challenge relates to the “jurisdictional gap,” which describes the fact that the Commission has jurisdiction over some entities that are expected to contribute to achievement of the EEPS goal (e.g., the electric utilities and the PBFA), but the Commission has no jurisdiction over many other critical contributors, including federal, state, and county government agencies and other large electricity consumers.

The EEPS Framework addresses these and other challenges by providing broad guidance on responsibilities and roles for various entities that can contribute to meet EEPS goals, as well as setting interim targets broken out in 5-year increments corresponding to the reporting periods prescribed in HRS § 269-96. The Framework also includes guidelines on measurement and evaluation of applicable EEPS savings. The Commission acknowledged that while the Framework is intentionally broad and flexible, it is based on information and resources available during its development (2010-2011), and it is expected that regular evaluation of the EEPS Framework and the EEPS targets will continue, and may result in modifications or adjustments over time.

II. Estimates of 2009 – 2015 Statewide Energy Efficiency Savings

Pursuant to HRS § 269-96, the Commission has evaluated progress towards meeting the statewide EEPS goal of 4,300 GWh by 2030. In this report, EEPS savings are measured beginning in 2009 (the first performance year) with the final performance year being 2015. The total performance target for this seven year reporting period is 1,375 GWh.

Table 1 lists the annual targets for the first reporting period. The first reporting period starts in 2009 and, thus, includes two additional years compared other periods outlined in the EEPS Framework.

Table 1. Interim EEPS Targets, 2009 - 2015

Year	EEPS Target (GWh)
2009	196.5
2010	196.5
2011	196.4
2012	196.4
2013	196.4
2014	196.4
2015	196.4
Total	1,375

Methodology for Estimating EEPS Savings

There is a considerable range of uncertainty regarding the various estimates of energy savings applicable to EEPS. For example, on one end of the spectrum, savings reported by the PBFA are subject to independent measurement and verification performed by an auditor under contract to the Commission. On the other end of the spectrum, estimating the effect of building codes enacted after 2008 on new construction is challenging given lack of data on current construction practices and evidence of what the efficiency of construction practices would have been in the absence of building codes.

Given the varying levels of uncertainty, estimates of contributions to meeting the EEPS performance targets are categorized as follows:

- **Verified**: Includes savings claimed by the PBFA for energy efficiency program activities that are subsequently measured and verified by an independent auditor.

- High Confidence: Includes savings claimed by KIUC but not independently verified; forecast savings by the PBFA required under their current contract (through 2015); and past savings funded under the federal American Reinvestment and Renewal Act. These savings are tracked in databases on a measure-by-measure basis. Transmission, distribution, and generation savings associated with PBFA program activities are also included.
- Low Confidence: Includes savings estimates and forecasts derived from state, federal, and local building codes and appliance standards enacted after 2008, as well as savings estimates from entities with public sustainability goals that are consistent with statewide goals. These agencies are generally outside the jurisdiction of the Commission; however, they have defined long-term goals for energy efficiency and are actively pursuing savings opportunities.

PBFA Savings Estimates

Energy efficiency savings achieved through the PBFA are reported as gross generation savings (i.e., avoided gross utility generation, including avoided power station use and transmission and distribution losses). All estimates include solar water heating savings attributable to PBFA incentive programs.

KIUC Savings Estimates

Savings from KIUC include impacts reported from program years 2009 through 2012. Forecast KIUC savings for 2013 through 2015 are conservatively estimated to be equal to maintenance of program achievements from previous years.

US Department of Defense Savings Estimates

Military savings are estimated by applying the federal Energy Independence and Security Act energy efficiency targets, which require a 30% energy use reduction by 2025. This requirement is applied to estimates of US Department of Defense electricity consumption. Any participation by the military in the PBFA program is subtracted from this figure to avoid double counting and arrive at an incremental annual contribution of energy efficiency not captured through the PBFA.

Hawaii State Government Savings Estimates

State agency consumption estimates rely on the HRS § 269-96 EEPS goal of meeting 30% electricity use reduction by 2030. This target is multiplied by a baseline estimate of total electricity consumption by state agencies. It is assumed that one-third of the target is met through contributions from the PBFA, which are subtracted from the overall savings target to avoid double counting and arrive at an incremental annual contribution of energy efficiency not captured through the PBFA.

Savings Estimates from Building Codes and Appliance Standards

Savings in new construction from building codes is estimated by assuming a building turnover using a 60 year building life and estimating a 20% improvement in building efficiency as buildings are replaced. One third of building energy use is assumed to be plug loads not available for improvement through building codes. This estimate does not include an incremental savings for new buildings that do not replace existing buildings and is thus a conservative estimate. This methodology is used for estimating effects of building codes for years 2009 through 2012.

The 2013 Energy Efficiency Potential Study (described in more detail below) produced an estimate of savings attributable to federal and state appliance standards and codes that take effect after 2008 (however, the Energy Efficiency Potential Study produces estimates starting in 2013). This methodology is used for estimating potential from these sources between 2013 and 2015.

Performance of Hawaii Energy

Hawaii Energy is a ratepayer-funded energy efficiency services provider administered under contract with the Commission. Hawaii Energy serves electric utility customers on the islands of Hawaii, Maui, Molokai, Lanai, and Oahu (KIUC currently administers its own energy efficiency program for its customers).

Hawaii Energy's programs and services are funded by a Public Benefits Fee surcharge collected through customer bills.⁷ Hawaii Energy is administered by a third-party under contract with the Commission by the PBFA. Energy savings

⁷See Haw. Rev. Stat. §§ 269-121 – 269-124. See also Decision and Order No. 23258, Docket No. 05-0069, filed on February 13, 2007.

reported through these programs developed by the PBFA are subject to verification by an independent auditor.⁸

Leidos Engineering, LLC serves as the current PBFA. The company is under contract with the Commission to design and implement the Hawaii Energy program until December 31, 2015 (with a possible extension until December 31, 2016 at the discretion of the Commission). Under the PBFA contract, 70% of the PBFA budget is designated for direct incentives in the form of cash rebates or services for customers. Total administration costs including those for evaluation, measurement, and verification (“EM&V”), the PBFA Contract Manager, the Fiscal Agent, and the program finance auditor are limited to 10% of the overall budget.

Total program impacts over the first four program years are shown in Table 2.⁹ All energy savings reported and claimed under the EPPS framework must be cost effective to be applicable to the EEPS goal. Between 2009 and 2012, Hawaii Energy has saved over 637 GWh in electricity and delivered those savings to customers at a small fraction of the utility’s cost of electricity generation. The Total Resource Benefit of Hawaii Energy programs and services is nearly \$500 million, with lifetime customer bill savings attributable to Hawaii Energy exceeding \$1.5 billion.

Table 2. Summary of Hawaii Energy Program Expenditures and Customer Savings

Program Year	Program & Admin Expenditures (\$M)	Demand Reduction (MW)	1 Year EEPS Savings (GWh)	Lifetime Cost of Saved Energy (cents/kWh)	Lifetime Customer Bill Savings (\$M)
2009	\$18.2	28.12	153.8	1.5	\$255
2010	\$20.1	21.02	146.6	1.8	\$473
2011	\$27.3	21.34	178.3	2.5	\$408
2012	\$32.8	18.74	158.5	3.1	\$405
Total	\$98.8	89.22	637.2	2.2	\$1,541

Note: Lifetime cost of saved energy refers to Hawaii Energy expenditures, including administration of the program, relative to energy savings measured over the expected life of the individual energy efficiency measures installed in that year. Customer bill savings are reported by the PBFA as undiscounted customer savings over the life of the efficiency measures based on the prevailing retail electricity rate at the end of each program year. Both measures are net of free-riders.

⁸See Haw. Rev. Stat. § 269-124(7).

⁹Detailed Annual and Monthly program reports describing the activity of the PBFA since its inception can be found online at: <http://www.hawaiienergy.com/information-reports>.

For program year 2013, the PBFA contract specifies a slightly higher EEPS savings target of 181.5 GWh. Overall, Hawaii Energy is expected to provide approximately 1,182 GWh (86%) of the 1,375 GWh savings target for the first EEPS performance period.

While Hawaii Energy has provided a significant majority of energy savings applicable to EEPS, it is expected that maintaining the high performance levels achieved to date will be more difficult in the future. As an example, savings achieved in the early years have been boosted by lighting upgrades (such as compact florescent replacements for incandescent light bulbs, which is an extremely cost-effective upgrade). However, the federal Energy Independence and Security Act establishes lighting standards that begin to take effect in 2014 and will effectively phase out incandescent bulbs entirely by 2020. This means that energy savings from lighting improvements will not be available for capture by Hawaii Energy because they will already be mandated by law.¹⁰ As a result, Hawaii Energy has begun to shift focus away from the “low-hanging fruit” to other energy efficiency options.

Summary of Statewide EEPS Savings

The EEPS Framework provides guidelines on measuring and reporting progress towards achieving the EEPS goal of 4,300 GWh by 2030. Table 3 below indicates that substantial progress has been made towards the first performance period EEPS targets. The best available estimates of statewide energy savings applicable to EEPS suggests that the State is on track for meeting 2015 interim target.

Though Hawaii is on track to meet the 2015 interim EEPS target, whether the State will actually exceed the interim target depends on several factors. The most important factor is the future contribution of Hawaii Energy, which the Commission has high confidence will continue to provide the bulk of the energy savings in the first reporting period (2009-2015). However, it is not expected that the EEPS interim target will be met by contributions from Hawaii Energy alone.

¹⁰ Lighting energy savings are still applicable to EEPS, but will be categorized under building codes and appliance standards, rather than as contributions from the PBFA.

Table 3. Summary of Statewide EEPS Savings, 2009 through 2015 Projected

Program Year	Verified Savings (GWh)	High Confidence Savings (GWh)	Low Confidence Savings (GWh)	Total Savings (GWh)	Total Savings as Percent of EEPS Target
2009	138.7	19.3	31.9	189.9	97%
2010	132.2	21.9	31.9	186.0	95%
2011	160.8	29.5	31.9	222.2	113%
2012	142.9	20.6	31.9	195.5	99%
Subtotal 2009 - 2012	574.6	91.3	127.7	793.6	101%
2013P	0	186.5	13.2	199.6	102%
2014P	0	186.5	58.9	245.4	125%
2015P	0	186.5	128.0	314.5	160%
Reporting Period Total	574.6	650.7	327.8	1,553.2	112%

Another important factor is the extent to which government agencies and other entities not subject to oversight by the Commission contribute energy savings in addition to those provided by Hawaii Energy. While savings attributable to Hawaii Energy are carefully tracked and reported, many of the largest energy consumers in the State do not explicitly track annual energy efficiency implementation progress or do not routinely share savings estimates with the Commission.

This highlights the importance and the value of explicit energy efficiency goals for all entities contributing to achievement of EEPS, including measurement and reporting of energy savings to the Commission so that all applicable savings can be documented and reported to the Legislature in accordance with HRS § 269-96.

III. Achieving the 2030 Energy Efficiency Portfolio Standard

Statewide Energy Efficiency Potential

The Commission requires accurate information about electric energy savings potential and its associated costs on an ongoing basis in order to design effective energy efficiency programs and to efficiently allocate expenditures towards meeting EEPS goals. To this end, the EEPS Framework provides that updated energy efficiency potential studies for all electric utility service territories would be conducted for EEPS planning purposes.

The goal of the statewide 2013 Energy Efficiency Potential Study is to assess the short-, mid-, and long-term achievable market potential for cost-effective energy efficiency available for capture. This includes non-regulated entities able to contribute to energy savings.

The 2013 Energy Efficiency Potential Study provides information for program implementers to better target energy efficiency services (including those of Hawaii Energy, KIUC, and other contributing entities). It also provides analyses that can be utilized by the electric utilities (the HECO Companies¹¹ and KIUC) in future integrated resource planning (“IRP”) processes to identify and characterize energy efficiency resources available within their respective service territories for each IRP period. The study also provides new data for consideration by the EEPS Technical Working Group and the Commission regarding the guidelines and requirements in the overall EEPS Framework.

Both the HECO Companies and KIUC have conducted prior energy efficiency potential studies; however, these studies were based on data originally collected in the mid-1990s. Accordingly, as part of the Energy Efficiency Potential Study, a new statewide baseline data gathering effort was launched as well, with the aim of understanding the energy consumption characteristics of appliances, machinery, heating and cooling equipment, and other devices installed on customer premises throughout the State (“Baseline Study”).

This updated Baseline Study gathered data from commercial and residential customers through a combination of mail surveys, telephone surveys, and on-site visits to customer facilities. The data was gathered in such a way as to provide a statistical representation of each type of customer (e.g., single-family home, high-

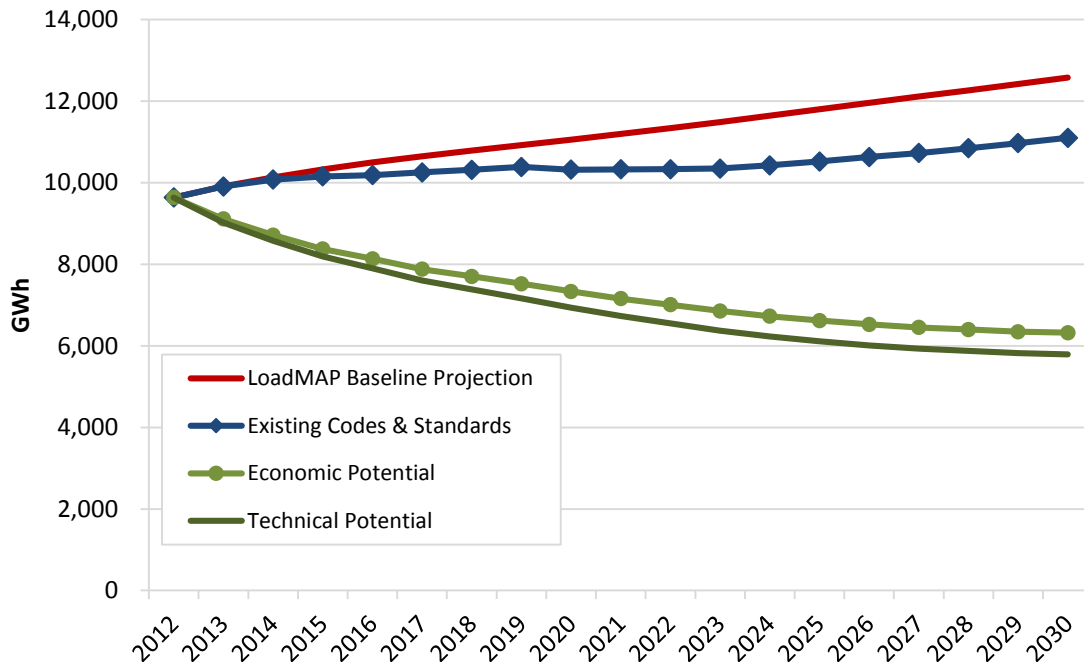
¹¹The “HECO Companies” include Hawaiian Electric Company, Inc., Maui Electric Company, Ltd., and Hawaii Electric Light Company, Inc.

rise condo, office building, resort complex, grocery store, etc.) for each utility service territory within the State. The results of the Baseline Study, along with census data and current KIUC and HECO Companies’ sales data, were utilized as inputs into the statewide 2013 Energy Efficiency Potential Study.

Key Findings of the 2013 Energy Efficiency Potential Study

The 2013 Energy Efficiency Potential Study estimates that by 2030, there is substantial potential for reducing energy use in the State – more than 6,300 GWh of economic (cost-effective) potential (Figure 3, above). The high cost of electricity throughout Hawaii contributes to the substantial portion of technical potential that is also cost-effective. Although there are additional barriers to adopting energy efficiency besides cost-effectiveness, a best-in-class energy efficiency program can be expected to achieve the majority of the potential economic potential. In order to achieve these savings, the current programs will need to continue to increase awareness of the value of energy efficiency and accelerate energy savings.

Figure 4. Statewide Electricity Savings Potential Compared to Baseline Projection



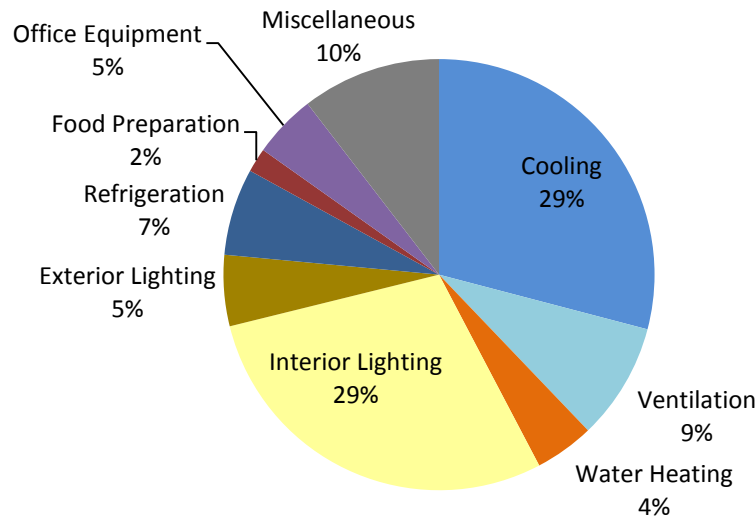
The Energy Efficiency Potential Study analysis shows that in 2030 energy efficiency could more than offset any anticipated load growth expected to occur over that time period (Figure 4, above). Although it appears that the State is on track to achieve the EEPS goal by 2030, it is clear that additional savings could be

achieved beyond the savings goal established in statute. Striving to exceed the EEPS goal and capture additional energy efficiency potential would result in significant additional cost savings for the State’s households and businesses.

Commercial Electricity Savings Potential

Based on the results of the Energy Efficiency Potential Study, the majority of the statewide energy efficiency savings potential is found in the commercial sector. Commercial electricity use is currently driven primarily by cooling and lighting needs. End uses in the commercial sector are shown in Figure 5. (Note: certain types of commercial buildings have specific use profiles that vary from sector totals. For example, grocery stores have much higher refrigeration consumption patterns).

Figure 5. Commercial Electricity Use By End Use, 2012

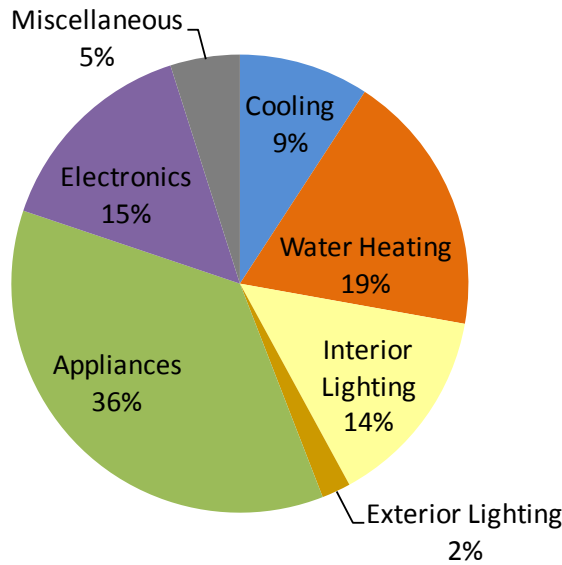


Over the study period (2012 through 2030), commercial sector potential savings are primarily driven by lighting improvements and water heating savings. LED lamps, as well as savings from super T8 light bulbs linear fluorescent light bulbs, can contribute significant savings, as well as the installation of heat pump water heaters.

Residential Electricity Savings Potential

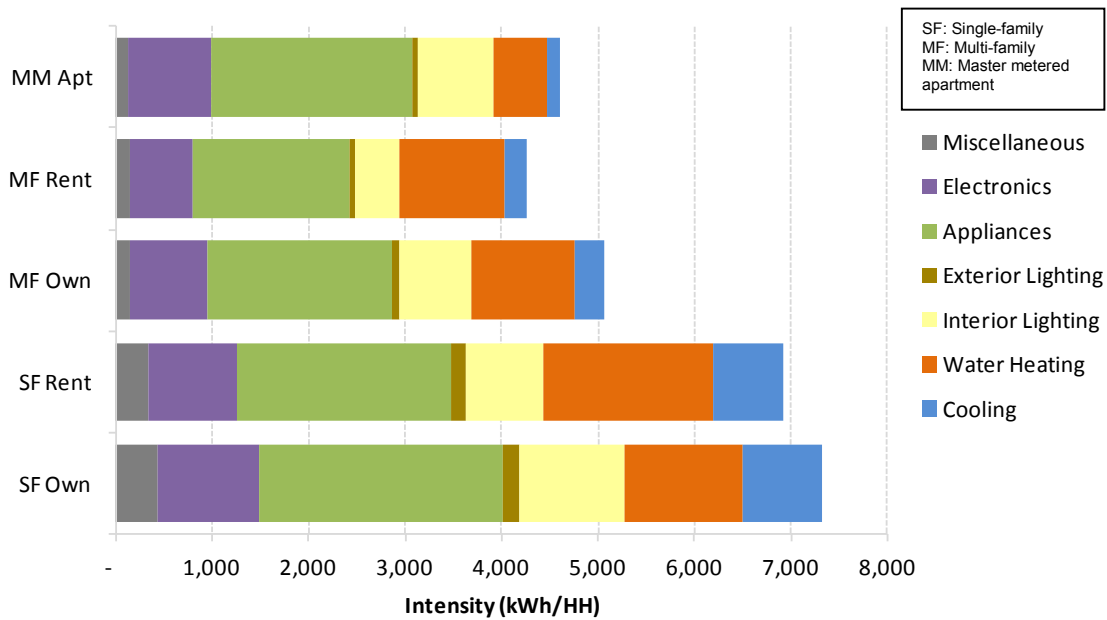
While commercial sector savings are the largest portion of the State’s potential by 2030, in the early years almost half of the energy efficiency savings potential is found in the residential sector. Residential electricity use is currently driven by appliances, water heating, lighting, and electronics, as shown below in Figure 6.

Figure 6. Residential Electricity Use By End Use, 2012



However, residential electricity use varies by household type, as shown in Figure 7. Single-family homes generally use larger amounts of electricity per household, particularly, appliances, lighting, and cooling, while renters in large multi-family buildings use the least amount of electricity.

Figure 7. Residential Intensity by End Use and Market Segment, Statewide (kWh/household, 2012)



In the residential sector, the potential savings come from a few key energy efficiency measures. Lighting savings can be obtained by conversion of interior and exterior lamps to LED lamps. Water heating savings can be achieved by

installing solar water heating or more efficient water heating equipment, as well as low flow showerheads and faucet aerators. Savings in electronics, such as televisions, computers and set top boxes are primarily driven by the manufacturing practices that meet ENERGY STAR guidelines as an industry standard.

IV. Findings and Conclusions

Hawaii is On Track to Meet the 2015 Interim EEPS Target

The EEPS goal established by the Legislature in 2009 has spurred the rapid scale-up of energy efficiency programs and corresponding energy savings. Through the 2012 program year, Hawaii Energy alone contributed 81% of cumulative annual EEPS targets, with that contribution expected to rise to nearly 86% by the end of the reporting period.

In addition, anecdotal evidence suggests that other contributing entities (including state and federal government agencies) have embarked upon aggressive energy efficiency efforts that are applicable under EEPS. However, at this time, the Commission is only able to estimate these contributions with low confidence due to a lack of available data.

Despite the uncertainty, the best estimates available to the Commission suggest that Hawaii will exceed the 2015 interim EEPS target by approximately 178 GWh, or more than 12% above the cumulative target for the reporting period.

Statewide Energy Efficiency Potential Exceeds the EEPS Goal

The 2013 Energy Efficiency Potential Study indicates the available untapped energy efficiency resource in Hawaii far exceeds EEPS goal of 4,300 GWh. According to the results of the Energy Efficiency Potential Study, the total cost-effective energy efficiency resource statewide is greater than 6,300 GWh, or nearly 50% greater than the current EEPS goal. Much of this economic potential is expected to be achievable by developing best-in-class energy efficiency programs and through the contributions of building codes and appliance standards.

Hawaii's Energy Efficiency Portfolio Standard is Effective and Achievable

The Commission is aggressively pursuing energy efficiency as a valuable and under-utilized resource in the State's energy portfolio. As the performance of the PBFA demonstrates, demand-side resources such as energy efficiency provide significant benefits to ratepayers that far exceed the cost of providing the programs and services. Energy efficiency benefits are available to be captured by all ratepayers, and Hawaii Energy is required to offer specific programs and services targeted toward low-income customers. Furthermore, the 2013 Energy Efficiency Potential Study indicates that there is substantial untapped energy efficiency resource available throughout the State.

In addition, energy efficiency provides many other important benefits to Hawaii's utilities and ratepayers, including reduction in the utilization of the grid (which can reduce utility capital and maintenance expenses), energy savings that persist for many years, peak demand reduction (lower requirements for generating capacity), reductions in the cost of compliance with environmental regulations, improvements in the ability to integrate variable renewable resources into the existing power system, and reductions in overall electricity sales that contribute to meeting the State's RPS. Furthermore, Hawaii Energy has several programs specifically targeted to provide savings to low-income ratepayers, renters, and other "hard to reach" customers.¹²

Based on the current performance of Hawaii Energy, the energy efficiency contributions of other key stakeholders, and the results of the latest Energy Efficiency Potential Study, the Commission has determined the EEPS goal remains effective and achievable.

The results of the statewide Energy Efficiency Potential Study provide new data and analysis relevant to both the design of programs and services administered by the PBFA as well as the overall implementation of the EEPS Framework. Accordingly, the Commission will convene a meeting of the EEPS Technical Working Group in January 2014 to review the results of the statewide Energy Efficiency Potential Study and to consider the following questions:

- Whether the Commission should adjust the overall EEPS goal (4,300 GWh).
- Whether the Commission should establish targets, incentives, or penalties for energy savings performance by contributing entities or for individual islands/utility service territories (in addition to those for Hawaii Energy, which is administered under contract with the Commission).
- Whether the Commission should adjust the amount of ratepayer funds that are collected and allocated to energy efficiency programs through the Public Benefits Fee.

¹²As previously noted in this Report, the Commission anticipates the launch of an on-bill financing program in early 2014 that is intended to assist "hard to reach" customers in taking advantage of the benefits of energy efficiency technologies, as well as other renewable energy technologies.

- How the design and implementation of Hawaii Energy's programs and services should be modified based on the results of the Energy Efficiency Potential Study.
- Whether Hawaii Energy's responsibilities should be expanded to include providing energy efficiency services to customers on Kauai.
- Whether recommendations should be made to the Legislature to encourage energy efficiency achievement, measurement, and reporting of savings by non-regulated contributing entities in compliance with HRS § 269-96, as well as ensuring energy savings potential attributable to building codes and appliance standards can be measured and reported to the Commission.

While the Commission does not believe that legislative action is necessary at this time, the Commission continues to monitor the achievement of the EEPS goal on an ongoing basis. The Commission will consider the input of the EEPS Technical Working Group on the issues identified above, and may determine an adjustment is warranted to the guidelines and requirements of the EEPS Framework and may recommend specific legislative proposals for the 2015 Legislative Session.

Pursuant to HRS § 269-96, the next report to the Legislature on the status of the State's Energy Efficiency Portfolio Standard will be submitted in advance of the 2019 Legislative Session.