

ANNUAL PLAN PROGRAM YEAR 2018



Hawai'i Energy's mission is to empower island families and businesses to make smart energy choices that reduce energy consumption, save money and pursue a 100% clean energy future.

TABLE OF CONTENTS

| 1.0 | INTRODUCTION | 3 |
|------|---|----|
| 2.0 | CONTINUED PROGRAM EVOLUTION | 6 |
| 3.0 | MARKETING & COMMUNICATIONS | 19 |
| 4.0 | CLEAN ENERGY ALLY PROGRAM STRATEGY & DETAILS | 24 |
| 5.0 | TRANSFORMATIONAL PROGRAM STRATEGY & DETAILS | 28 |
| 6.0 | RESIDENTIAL PROGRAM STRATEGY & DETAILS | 36 |
| 7.0 | BUSINESS PROGRAM STRATEGY & DETAILS | 44 |
| 8.0 | BUDGET | 53 |
| 9.0 | PERFORMANCE GOALS & INCENTIVE TABLE | 54 |
| 10.0 | CONCLUSION | 57 |
| 11.0 | APPENDIX | 58 |

LIST OF FIGURES

| Figure 1 - PY18 Program Performance Targets and Impacts | 5 |
|---|------|
| Figure 2 – Oʻahu Annual Average Daily Load Curve | 8 |
| Figure 3 - Clean Energy Ally Engagement Cycle | . 24 |
| Figure 4 - Examples of Ally Feedback and Program Response | . 25 |
| Figure 5 - List of Residential Programs | . 41 |
| Figure 6 - List of Business Programs | . 46 |

1.0 INTRODUCTION

The State of Hawai'i has committed to achieving 100% clean energy by the year 2045. To achieve this, the families and businesses of Hawai'i will need to play an important role in reducing their energy consumption, shifting when they use energy, and potentially install renewable energy and storage systems. As of 2017, Hawai'i is at 25% clean energy; however were it not for energy efficiency, this figure would actually be 21%. As the first step in the ideal loading order toward a reduction of energy bills, energy efficiency ultimately makes families and businesses more resilient.

With a significant focus on Hawai'i's ambitious 100% clean energy goal, many often overlook the state's Energy Efficiency Portfolio Standard (EEPS) of a 4,300 GWh reduction by 2030. While the time and locational value of energy efficiency continues to evolve, it is important to remember that EEPS is a foundational part of Hawaiian Electric Companies' Power Supply Improvement Plan (PSIP) and plays an important role in reducing the amount of energy the utility will need to either produce or procure on the path to 100% clean energy.

Where does Hawai'i Energy fit? First off, Hawai'i Energy educates island families and businesses about the many, lasting benefits of clean energy and encourage and reward practical, everyday energy-saving decisions. As a result, and together with our customers, we can save money, grow our economy and reduce the demand for electricity and foreign imports.

Energy efficiency remains the quickest and cheapest clean energy resource. At a lifetime cost of a little over 2 cents a kilowatt-hour, there isn't a more cost-effective option available. You can see the benefits when taking a look at home looking to install rooftop solar. Energy efficiency is typically one-third to half the full cost of rooftop solar. Implementing efficiency opportunities before sizing a rooftop system will reduce the size of the system that needs to be purchased. As noted in a recent American Council for an Energy Efficient Economy report, "instead of installing a 5 kW home solar system, efficiency can be used to reduce demand. The result: the home may need only a 3.5 kW system, reducing the investment by \$2,500 per home, even after including the cost of the efficiency improvements."¹

The report went on to note "if efficiency is used to reduce total utility system loads, the cost of a grid with a high percentage of renewable generation can be substantially reduced. For example, a recent study by the International Renewable Energy Agency found that pursuing both efficiency and renewables will increase the share of load supplied by renewables (because total loads are reduced) and reduce system costs and carbon emissions relative to both business-as-usual and renewable-only scenarios."

In Hawai'i over 20% of residents have adopted rooftop solar. As rooftop solar increases, we will need to rely on additional distributed energy resources such as demand response programs, energy efficiency, off-peak energy storage and electric vehicles.

On Earth Day 2018, Elemental Excelerator released the results of the "Transcending Oil" report conducted by Rhodium Group. The report showed accelerating Hawai'i's efforts on clean energy could generate \$6.5 billion in savings for the State. This aligns with the 2014 independent assessment which estimated that Hawai'i's economic energy efficiency potential could be as high as 6,210 GWhs by 2030, 44% greater than

¹ http://aceee.org/blog/2016/11/how-create-big-opportunities-save

the current goal. The Transcending Oil report estimates an additional 3,500 well-paying jobs could be created by accelerating our efforts in clean energy.

The good news is through the efforts of Hawai'i Energy and the families and businesses of Hawai'i, we remain on track to achieve the Energy Efficiency Portfolio Standards. However, investment in energy efficiency programs has decreased in this current three-year program cycle. While the Hawai'i Energy programs have been able to achieve record savings despite reduced budgets, this is not sustainable. As lighting – the most cost-effective measure in the portfolio – is more significantly reduced in this upcoming Program Year 2018 (PY18), the program will drive for deeper retrofits and continue to focus on increasing participation from hard to reach markets. To accomplish this successfully, additional funding and updates to the metrics used to measure success will be needed in the next three-year cycle.

Hawai'i Energy's promise is putting Hawai'i on the fast track to 100% clean energy. Our focus has been primarily on energy efficiency, and in this upcoming program year this again will be our focus. However, we recognize that the distributed energy landscape is complex and integrated so our solutions need to evolve as well. This view has grown from conversations with many of our stakeholders. We have conducted feedback sessions and facilitated stakeholder engagement sessions, which we describe in more detail within this Annual Plan. We recognize that any major shifts would occur as part of our next three-year program cycle, which begins in July of 2019, but over the course of PY18 we will continue to work on defining new metrics, desired outcomes, and programmatic solutions that can best serve Hawai'i.

Directly related to this effort, we will be launching some new initiatives to inform the planning around the next three-year program cycle. We have created a new section in this Annual Plan to highlight the initiatives we will be pursuing in the upcoming program year as we evolve our initiatives to become more of a grid resource and expand the portfolio of options and their related educational components. Additionally, because of our deep-rooted community partnerships, there is perhaps no other entity as well-equipped to address the energy equity issues in our state and ensure our most vulnerable populations are not left behind.

Hawai'i Energy takes our responsibility and our obligation to deliver energy savings and education to ratepayers in a cost-effective manner very seriously as the Hawai'i Public Benefits Fee Administrator (PBFA) under contract with the Hawai'i Public Utilities Commission (PUC). On behalf of Leidos Inc. ("Leidos") and the Hawai'i Energy programs, we are pleased to present the Annual Plan for Program Year 2018 (PY18) which covers the period July 1, 2018 through June 30, 2019.

1.1 Plan Overview

This PY18 Annual Plan provides detailed strategies, budget, goals and a roadmap for administration and delivery of the Hawai'i Energy Program based on enhanced PBFA statutory authority, our experience to date, PUC directives and the State's clean energy goals.

Key features of this PY18 Annual Plan include:

a. Utilizing a \$29.3M budget to provide program-level impacts of 127,563,746 kWh first year savings with \$0.0218 (LBNL Cost of Saved Energy (CSE)) per kWh average lifetime

Program acquisition cost, a significantly reduced (6% reduction) CSE when compared to PY17's \$0.0232/kWh, PY16's \$0.024/kWh and PY15's \$0.034/kWh;

b. Continued commitment to cultivating "force multipliers" – community members who promote offerings and generate awareness for the Program;

- c. Comprehensives services and data analytics to enable targeting and enhanced engagement with customers;
- d. Advocacy and outreach support for advanced building energy codes and standards; and
- e. Further collaboration with the utility's programs to serve as a catalyst for 100% clean energy.

The PY18 key program energy figures are as follows:

- Customer level first year energy impact of 152M kWh
- 2,027,808,761 kWh in customer level savings over the life of the measures
- Lifetime Cost of Saved Energy (CSE) of \$0.0218
- Annual cost savings to participants of \$38 Million
- Lifetime project cost savings of \$510 Million

Figure 1 - PY18 Program Performance Targets and Impacts

| PY18 Plan | 1st Year \$/kWh | Lifetime \$/kWh | Average Life yrs. | Incentives | 1st Year Energy Program Level (kWh) | Lifetime Energy Program Level (kWh) |
|--------------------------|--------------------|--------------------|----------------------|--------------|--|--|
| Residential | \$0.164 | \$0.015 | 10.7 | \$7,589,589 | 46,378,144 | 495,140,011 |
| Business | \$0.139 | \$0.010 | 14.2 | \$11,298,335 | 81,185,602 | 1,152,006,293 |
| Direct Incentives Only | \$0.148 | \$0.011 | 12.9 | \$18,887,924 | 127,563,746 | 1,647,146,304 |
| Residential Transformati | | | \$1,051,373 | | | |
| Business Transformation | | | \$1,098,627 | | | |
| Transformational Only | | | | \$2,150,000 | | |
| Program Cost | \$0.165 | \$0.013 | | \$21,037,924 | 127,563,746 | 1,647,146,304 |
| Customer Level Savings | | | | 152,405,876 | 2,027,808,761 | |

| Customer Level Savings | Assumed Electricity Rate | Bill Savings | |
|---|-----------------------------|--------------|---------------|
| | \$ / kWh | Annual | Lifetime |
| Potential Cost Savings | \$0.25 | \$38,787,526 | \$510,329,145 |
| Average Project Simple Payback | | 2.1 years | |
| Potential Participant Capital | | | |
| Investment | | \$79,741,812 | |
| Direct Incentives | | \$18,887,923 | |
| Average Project Incentive as a % of Proje | ct Cost | 24% | |

2.0 CONTINUED PROGRAM EVOLUTION

The State of Hawai'i has aggressive clean energy goals and utility action plans² for accelerating the use of demand side resources, renewable energy, storage and the electrification of transportation. Because these goals have significant implications for the evolution of the traditional energy efficiency programs, Hawai'i Energy has actively engaged with industry stakeholders to discuss and plan for critical program updates that will best serve customers and the grid within our evolving energy ecosystem. Along with multiple individual meetings, we hosted two significant events in PY17 that proved foundational in shaping this dialogue.

Stakeholder Meeting

On February 14, 2018 Hawai'i Energy hosted its first interactive stakeholder meeting to inform program design and PY18 planning efforts. Attendees included representatives from the Consumer Advocate, Aloha United Way, Maui Economic Development Board, Hawai'i Green Growth, Oahu Economic Development Board, PUC, HECO, HNEI, Blue Planet Foundation, Ulupono Initiative, Kamehameha Schools, Chamber of Commerce of Hawai'i Small Business Program, EPA, City and County of Honolulu, HCATT and DERC.

Facilitated in collaboration with the Elemental Excelerator, the meeting fostered meaningful dialogue around the ways the Program can evolve in order to continue to play a pivotal role in Hawai'i's dynamic energy landscape. Through these efforts, we were able to identify key initiatives that Hawai'i Energy should consider implementing to drive energy efficiency and economic growth, improve resiliency, and enable a 100% clean energy future. Focus areas included: low income programs for the Asset Limited Income Constrained (ALICE)³ population, energy efficiency as a grid resource, energy efficiency and transportation, education and training programs for workforce development, and enhanced codes and standards. The group work focused on defining the purpose of suggested initiatives, pinpointing specific actions that need to take place in order to enable them, and identifying the metrics that could be used to measure success. For a full summary of results see Appendix E.

Innovation Symposium

The second significant event was our inaugural Innovation Symposium, which took place on April 26, 2018 at the Sheraton Waikiki. Attended by almost 200 people with more than 20 exhibitors, the full-day conference featured a number of energy-related seminars and a diverse group of accomplished speakers. It was headlined by Elemental Excelerator's Dawn Lippert and HNEI's Jennie Potter, who shared their insights on innovation in Hawai'i's evolving energy ecosystem. The event was designed to provide Hawai'i businesses of all sizes with vital tools necessary to evaluate their energy usage and increase their profits by focusing on connecting customers, clean energy allies and other energy stakeholders.

Hawai'i Energy hosted an idea harvesting session during the closing plenary during which we gathered feedback and suggestions for what we could do to make the programs more effective, where there were challenges to participating, and how we could improve overall awareness of programs. This session proved invaluable in capturing the voice of our customers and clean energy allies to inform future program design. Feedback was valuable and ranged from short term to long term planning with both tactical and strategic input. We found that a number of comments shared echoed input provided during the stakeholder

² <u>https://www.hawaiianelectric.com/Documents/about_us/our_vision/psip_executive_summary_20161223.pdf</u>

³ https://www.auw.org/alice

meeting, including strategic integration of energy efficiency with the electrification of transportation and the need for additional data and monitoring for integrated demand side management.

2.1 Designing PY18 Demonstration Initiatives for PY19 and Beyond

Rapid advancements in technology, reductions in cost and continued high impact and success of innovative, new Hawai'i Energy efficiency programs in PY17 highlighted the opportunity and importance of advancing integrated demand side management (IDSM) in PY18 in coordination with the adoption of renewables, storage and electric vehicles (EV). The aligned focus on strategic electrification is necessary at the State, utility and Hawai'i Energy program level to support residential and commercial customers and accelerate Hawai'i on the path to 100% clean energy by 2045. This critical shift places new demands on the Public Benefit Fee (PBF) program design and requires close collaboration between the State, Hawaiian Electric Companies and Hawai'i Energy. As part of this shift, Hawai'i Energy will balance the accelerated development of new strategies and programs to support residential and commercial building adoption of comprehensive clean energy solutions, while ensuring that our most vulnerable populations do not get left behind or further disadvantaged with this progress. In PY18 we will be initiating several key collaborative demonstration efforts strategically aligned with non-wires alternatives to integrate demand side management, renewable energy and energy storage technologies. These initiatives, coupled with our ongoing stakeholder collaboration, will test innovative processes and programs will serve as catalysts to accelerating Hawai'i Energy PY19-21 performance period. In support of the development of new PY18 initiatives, customer engineering services and close collaboration with external stakeholders, Hawai'i Energy will be seeking supplemental funding for necessary staffing.

Energy Efficiency as a Grid Resource: Comprehensive and Strategic Alignment with Non-wires Alternatives

The utility load curve for Hawai'i has changed dramatically over the last 10 years, providing a real-time example of the non-coincident impact of solar PV generation on the historical demand curve – creating the classic "duck curve" (See Figure 2)⁴. As noted in a recent presentation by Pacific Northwest National Labs (PNNL), "PV, storage, DR and targeted EE [are] required to provide location-specific capacity deferral benefits." Hawai'i Energy programs have historically limited their focus to energy efficiency opportunities (and HECO to demand response), but the rapid acceleration and reduction of costs for storage, PV and EV's have increased the customer need for informed partners in developing building-level energy plans that align with state and county level climate action plans. This view has been shared by numerous stakeholders as well as Hawai'i Energy. There is a need for Hawai'i Energy to establish new performance metrics set to achieve EEPS targets while evolving to support comprehensive, lowest carbon IDSM solutions.

⁴ <u>https://controls.pnnl.gov/workshop/documents/2017/session2/talk2.pdf</u>



Figure 2 – O'ahu Annual Average Daily Load Curve

Key Partners:

Hawaiian Electric, Shifted Energy, Vermont Energy Investment Corporation, Hawaii Natural Energy Institute, Elemental Excelerator, Kevala, City & County of Honolulu

PY18 Initiatives:

Expansion of customer education, behavior modification, and energy efficiency kits for Smart Export PV and storage participants

As the lines across distributed energy resources blur and customers seek out holistic solutions, improving education was a key theme that emerged from our stakeholder engagement session. In the past, a number of customers who had installed PV panels were over-producing as compared to their monthly usage. In a number of cases, these customers also went on to install air conditioning since they were producing more energy than they were consuming and were still only paying a minimum amount under their existing Net Energy Metering (NEM) structure. This created problems on our grid with deep valleys during the day and then peaks in the evening.

With net energy metering closed to new customers and the uptick in residences installing solar and storage under the Smart Export program, a new opportunity arises. The proper sizing of PV and storage systems is critical in order for the economics to pencil out. This makes energy efficiency attractive since it costs significantly less to install energy efficiency measures than it does to add more PV panels and storage capacity.

In discussion with several of the large PV + storage providers, we've identified that these providers can be educators and ambassadors of energy efficiency with their potential clients. As a result, Hawai'i Energy intends to launch a demonstration project with one or several PV + storage solution providers to help educate customers on the impact their behavior has on their bill and to the grid. Hawai'i Energy will develop educational materials that will provide recommendations on how to maximize the savings and minimize the size of their PV and storage system by operating appliances such as dishwashers and dryers during the 9AM to 4 PM hour window, when no PV credit is received from the utility for some tariffs.

Hawai'i Energy will work with at least one provider who would be willing to cost-share in energy efficiency kits and education materials, with the potential of the provider to install these measures (LED lights, smart power strips, etc.) as part of the PV + Storage commissioning process with the customer. The idea is that by making this a new form of direct-install offering, it will be met with increased acceptance by customers

who are already actively engaging in their energy use and production and in turn create champions for this integrated EE + PV + Storage program. Based on the discussions noted earlier in this section, we have one PV + Storage provider already committed to provide energy kits and educational materials and we intend to continue the discussion around the option of direct installation. This provider is one of the top residential PV providers based on permits pulled and information shared with us. Once this first provider is successfully launched, we will do outreach to others in the industry to inform them of this program.

Hawai'i Energy will also work with interested provider(s) that have ongoing communication with their customers either through email or through their web and mobile applications. These communications can often show customer production and consumption information, and will be able to provide energy efficiency tips and behavioral suggestions so that residents of Hawai'i can truly play their part in the 100% clean energy future. We will also provide program literature on the incentives Hawai'i Energy offers on appliances, water heating, and air conditioning, as well as other new loads being considered.

Desired outcomes:

- Leverage other clean energy providers to provide energy efficiency products and education.
- Provide information on energy efficiency upgrades that could reduce the size of their PV and storage system purchase as well as the rebates available through Hawai'i Energy.
- For these residential customers installing PV and storage, helping them understand when they use their energy is important to maximize their savings (which coincides with a benefit to the grid).
- Gain an understanding of what PV + Storage providers are willing to do, and in certain cases, what incentives may be needs (such as direct install of certain measures).

How this will influence future program design:

- Measuring the response of interested PV + Storage providers to determine the ability to scale.
- Determining what measures are ideally suited for inclusion in kits and for direct install by PV + storage providers.
- Test messaging around the education of time of use and energy efficiency with this demographic.
- If successful, offerings in future years could expand to high efficiency, controllable *appliances* or smart thermostats to reduce energy consumption and enhance demand response participation viability.
- Future year additions to a PV + Storage + EE program could also include increased education around Electric Vehicle charging and potentially incentives for actions or equipment that provide grid benefits.

Estimated Budget: \$5,000-\$10,000 (REEM)

Expanded Data Monitoring and Geo-Targeting in Continuous Energy Improvement Initiatives (CEI)

Without data-informed, customer-sided, adoption of EE/DR with DER/Storage, the impact on the grid and energy costs could be significant and rife with lost opportunities for high-impact IDSM projects. Rocky Mountain Institute recently explained the concept of this strategy as - "wasting valuable renewable resources on inefficient end-use consumption makes little economic sense and slows the pace of decarbonization" and "if we think of decarbonization as a marathon we need to run, we can move the finish line closer (with efficiency) even as we accelerate the pace of our run (by adding renewables [and energy storage] to the grid)."⁵

⁵ <u>http://www.raponline.org/blog/energy-efficiency-2-0-new-questions-same-answer/</u>

During the PY16-17 performance periods Hawai'i Energy launched a number of initiatives through its *Energy In Decision Making* Market Transformation programs, including a Strategic Energy Management (Continuous Energy Improvement) initiative for commercial customers to engage customers in longer term planning efforts for IDSM. As part of this initiative, Hawai'i Energy uses a data analytics platform to help customers visualize their electricity use and model different scenarios based on improvements from energy efficient technology and load management strategies to achieve cost-effective energy and demand reductions.

In PY18, Hawai'i Energy will leverage existing and new energy monitoring and building automation systems (BAS) to strengthen the program's ability to support the identification and follow up actions for building and operations improvements. This data-informed strategy recognizes that individual buildings with dramatically different energy and use patterns require unique strategies for minimizing energy and peak demand through optimized adoption of a combination of EE, DER and storage solutions. As part of this initiative, we will explore tiered incentive structures to further promote advanced BAS control technologies and end-use and whole building energy monitoring. Based on established practices of leading energy efficiency programs, Hawai'i Energy plans to establish a new energy savings protocol to capture the engineering and analysis support that results in adoption of new IDSM measures and strategic electrification.⁶ Adoption of a complimentary, non-incentive, engineering-based program design and services recognizes the critical role and value that Hawai'i Energy brings to its commercial and industrial customers.

In PY18, Hawai'i Energy proposes to expand the focus of the existing CEI initiative to address specific grid constrained areas. The initiative would proactively engage and collaborate with commercial customers in identified grid constrained areas to identify and incentivize high impact, coincident peak DSM technologies and solutions. The Hawai'i Energy program will identify targeted grid constrained areas based on supplemental guidance and information shared by the Companies in collaboration and planning meetings; filings by Hawaiian Electric companies to the Public Utilities Commission; and emerging data coming from the Pathways to an Open Grid⁷ project. Based on recent filings and discussions with key stakeholders, South Maui was identified as a potential focus for PY18 geo-targeted CEI initiatives due to its recently reported capacity constraints. In addition, the significant percentage of non-firm generation capacity in Maui (38%)⁸ – more than half of which is customer sited renewable generation (56%) – represents an opportunity to assess the opportunity to integrate IDSM strategies with existing installed renewables to improve grid resilience and optimization.

The Hawai'i Energy team will provide building energy modeling and engineering support to CEI customers to analyze building load data, assess and optimize for "behind-the-meter" energy efficiency, storage, electric vehicle charging and PV generation. Hawai'i Energy will incentivize and support targeted opportunities in PY18 for scaled projects incorporating EE/Storage/PV/EV technologies. Assessing the opportunities, barriers, costs, savings and impacts of these projects will inform program designs for the PY19-2021 performance period. As part of the assessment of individual projects, Hawai'i Energy will evaluate the impact of future adoption of time-of-use (TOU) rate structures on the economics and rate of customer-level adoption of solar, storage and electric vehicles.

⁶ DOE/NREL Strategic Energy Management (SEM) Evaluation Protocol, 2017.

https://www.nrel.gov/docs/fy17osti/68316.pdf

⁷ https://www.pathways-opengrid.com/

⁸ Hawaiian Electric Power Facts 2017.

https://www.hawaiianelectric.com/Documents/about us/company facts/power facts.pdf

Desired Outcomes

- Utilize energy efficiency as a resource for optimizing behind the meter consumption to manage grid constraints and maximize the integration of renewables and storage.
- Identify different energy and use patterns in buildings and propose strategies for minimizing energy and peak demand through optimized adoption of a combination of EE, DER and storage solutions.
- Use data monitoring to document savings.
- Explore tiered incentive structures to further promote advanced BAS control technologies and enduse and whole building energy monitoring.
- Geo-target programmatic efforts to address grid constraints.

How this will influence future program design:

- Inform longer term plans to look at other impacts and additional technologies.
- Pre-post monitoring provides more granular data (beyond monthly data).
- Optimize our offerings to encourage the best holistic solution for customers, reduce confusion by
 increasing access to information and understanding and increase overall grid benefits of distributed
 energy resources.

Estimated Budget: \$50,000-\$100,000 (BTRAN), \$50,000-\$75,000 (CBEEM).

Locational Net Benefit Analysis

One way our program offerings can provide grid benefits is by addressing locations on the grid that would benefit from the investment in distributed energy resources and integrated demand side management. In PY17, Hawai'i Energy also began a data visualization initiative with Kevala, an Elemental Excelerator company and active participant in the Pathways to the Open Grid project. Our work with Kevala focused on developing a O'ahu-focused, GIS (geographic information systems)-based energy efficiency and communication tool to assess the value of location-specific energy efficiency measures consistent with the increasing trends toward Locational Net Benefit Analyses in California, New York, and other markets across the nation. In PY18, Hawai'i Energy will continue to this work to expand our ability to quantify the value to the grid of individual energy efficiency measures for the purpose of supporting energy efficient incentives and refined targeting of energy efficiency programs. We anticipate this tool will allow market participants to analyze the costs and benefits of existing and forecasted technology adoption in relationship to utility infrastructure, the savings for potential Hawai'i Energy participants, demonstrate the benefits to ratepayers and model scenarios using open data and transparent analysis.

We also anticipate in the future program design that might have different values depending on location if proper locational net benefits and temporal values of energy can be accurately determined and impact of programs measured correctly.

Desired Outcomes:

- Geo-target programmatic efforts to address grid constraints.
- Collaboration with Pathways to an Open Grid project in order to explore the time value of energy efficiency.
- Create energy efficiency visualization tool for customer use.

How this will influence future program design:

• This tool will allow market participants to analyze the costs and benefits of existing and forecasted technology adoption in relationship to utility infrastructure, the savings for potential Hawai'i Energy participants, demonstrate the benefits to ratepayers and model scenarios using open data and transparent analysis.

Estimated Budget: \$10,000-\$20,000 (BTRAN)

Residential End-Use Profiles

In PY18, we will build on our collaboration efforts with Hawaiian Electric's Demand Response team to dive deeper into load profiling for residential end use technologies. Together, we will be co-funding a grid interactive water heating (GIWH) project with Shifted Energy that will provide detailed water heating data and provide IDSM benefits to the hard-to-reach renter population. Given that solar water heating is tough to pursue in multi-family properties, this demonstration project will allow us to better understand water usage and duration of time for showers, temperature of water during showers, tank capacity for retaining heat, and the predictive load curve of existing water heaters.

Beyond the data collection, this project will serve hard-to-reach ratepayers, like renters in multifamily dwellings, who have few choices to participate in grid services. We anticipate these efforts will help enhance our framework for direct renter engagement as installations are not permanent and do not impact water heater access or operation. Also, with time of use rates on the horizon, enabling utilities to help renters shift a large part of their load could bring ongoing economic relief to key ratepayers.

Hawai'i Energy will also expand its Advanced Home Energy Insights study further in PY18. Initiated in PY17, this program provides a free Sense home energy monitor to 50 eligible customers. Through this program, Hawai'i Energy is able to collect and analyze information regarding device and equipment patterns in Hawai'i homes to support energy saving communications and measurements.

Together, the GIWH and Advanced Home Energy Insights initiatives will capture load profiles for the majority of energy using items in the home. This localized and time stamped data is incredibly important for valuing energy efficiency as a grid resource. These efforts will provide an estimate of the energy savings potential, customer benefits, and explore how the information developed and communicated by these devices can be used to inform energy efficiency programs, plans, and customer decisions. We expect these insights to help shape program design for the next three-year cycle beginning in 2019.

Desired Outcomes

- Support installation of 20 grid interactive water heaters and 50 Sense home energy monitors.
- Coordinate end-use profile data collection with HECO.
- Engage hard-to-reach renter population in water heating programs, which they are typically unable to participate in.

How this will influence future program design:

- Evaluation of TOU rates for hard-to-reach renter community.
- Provide an estimate of the energy savings potential, customer benefits, and explore how the information developed and communicated by these devices can be used to inform energy efficiency programs, plans, and customer decisions.

Estimated budget: \$15,000-\$25,000 (RTRAN), \$15,000-\$20,000 (CREEM)

Energy Efficiency and the Electrification of Transportation

Strategic electrification is a critical strategy for Hawai'i to achieve the 2045 clean energy goals. A recent study in the Northeast by Synapse⁹ highlighted the overlapping landscape of technologies, strategies and objectives and recognized the need of finding the right combination to achieve strategic electrification for a decarbonized regional grid. Additionally, Hawai'i Energy program alignment with the counties' goals for the electrification of transportation was identified as key program action area at both our Stakeholder Meeting and the Innovation Symposium. We propose the following initiatives for PY18.

Workplace Charging + Energy Efficiency:

The Hawaiian Electric Companies recently released its Electrification of Transportation Strategic Roadmap,¹⁰ outlining the importance of increasing the penetration of electric vehicles to reach Hawai'i's 100% clean energy goal. As part of these initiatives there will need to be significant investment in building infrastructure to support more prevalent electric vehicle charging in the workplace. Hawai'i Energy will work with Hawaiian Electric to support the installation of energy efficient technologies while upgrades for charging stations are taking place. Once ideal demonstration customer characteristics are defined, Hawai'i Energy will help with recruitment and education of customers to encourage a holistic approach to EE and EV charging.

Hawai'i Energy will coordinate efforts with Hawaiian Electric who is actively working with a handful of potential workplaces that would be ideal for a workplace charging program. Hawaiian Electric Company will be playing a big role in helping find the potential locations as well as the evaluation of whether these locations are ideal or not for participation. Once Hawaiian Electric Company narrows this group down to a couple of finalists, Hawai'i Energy will engage with both the workplace and Hawaiian Electric to identify energy efficiency opportunities and determine the savings from the proposed energy efficiency upgrades. The amount of customers who participate in this effort will range between one and three. The determination will be based on the workplace's ability to complete a project in the program year as well as the amount of incentive funding necessary for the targeted facilities to take action. Further analysis can be conducted to determine the overall impact to the electric bill from the combination of efficiency plus EV charging. Given Hawaiian Electric is doing the outreach and screening of the participants from an ideal workplace charging site, the resources required by Hawai'i Energy will not be very great.

The workplaces targeted will have operating hours mainly during the daytime period on a workday. This will mitigate any negative impact to the grid from the installation of energy efficiency measures only. Pairing the increased energy usage with energy efficiency should provide a grid benefit while trying to reduce the impact of an increase on the bill from EV charging. Additionally, it is the hope that the customer(s) selected would see a reduced cost in electrical infrastructure upgrades needed for the installation of EV charging stations through the load reduction attributed to energy efficiency.

Desired outcomes:

- Encourage EV charging during PV production hours to provide additional Ensure daytime load building is conducted with energy efficiency included.
- o Reduce the bill impact to workplaces considering EV charging stations for employees

 ⁹ <u>http://www.synapse-energy.com/sites/default/files/Strategic-Electrification-Regional-Assessment-17-018.pdf</u>
 ¹⁰ https://www.hawaiianelectric.com/Documents/clean_energy_hawaii/electric_vehicles/201803_eot_roadmap.pdf

- Develop and test coordinated messaging and education with Hawaiian Electric Companies around energy use, behavioral changes, and temporal elements of energy use and cost
- Minimize the potential negative grid impact to energy efficient upgrades on equipment primarily used during the solar peak
- Better understand how energy efficiency and incentives or other solutions can encourage broader workplace charging acceptance
- o Continued collaboration with the Hawaiian Electric Companies

How this will influence future program design:

- Determine what are the real barriers workplaces are facing around the adoption of EV charging and the integration of energy efficiency
- Determine what, if any additional energy efficiency incentives or programs could facilitate broader adoption of workplace charging infrastructure plus energy efficiency
- o Better understand what the market potential would be for this type of program offering
- Improve marketing and educational materials for an expanded offering in the future

Estimated Budget: \$10,000-\$30,000 (CBEEM)

Moloka'i Electric Vehicle Maintenance Technician Training

As the Island of Moloka'i proceeds towards its 100% clean energy by 2020 target, there will inevitably be additional electric vehicles being utilized. Currently the infrastructure to support the increased use of EVs is limited and there are no companies/locations outfitted to properly maintain the growing fleet. Presently, Servco sends a technician quarterly to Moloka'i to services EV's on the island but this is not adequate as the number of EV's increase on the island.

At the request of Hawaiian Electric, Hawai'i Energy proposes to be one of several partners bringing an EV vehicle maintenance technician training program to Moloka'i through our transformational program. These courses would develop local workforce capacity to repair and service electric vehicles on island, further reducing the barriers to adoption of EV's. For a small island like Moloka'i aiming to achieve 100% clean energy by 2020, adoption of EV's can be an important third leg in the stool. Hawai'i Energy's contribution to this effort is budgeted at \$5,000.

Hawai'i Energy sees several benefits to being one of the funders for this training as part of our transformational program. First of all, the island of Moloka'i is a very hard to reach market. We have had success on Moloka'i in previous efforts that included the Hui Up refrigerator trade-in program which has allowed us to build trust in this tight-knit community. Additional programs like EV technician training will help grow our standing in the community to hopefully pursue other energy efficiency and clean energy initiatives in the future. There are very limited opportunities like these on the island that can occur cost-effectively. This investment will help with our hard to reach, educational, and island equity metrics. Additionally, Moloka'i utility rates are the highest in the state. The additional EV load could prove burdensome without proper education on the importance of coupling electrification load with energy efficiency.

Desired outcomes:

- Help with the achievement of hard to reach, educational, and island equity metrics.
- Assist the Hawaiian Electric Companies leverage a number of partners to provide on-island EV technicians for Moloka'i.
- o Increase Hawai'i Energy's presence and contribution to the Moloka'i community

o Continued collaboration with clean energy partners and the utilities.

How this will influence future program design:

• This project is not anticipated to influence future program design.

Estimated Budget: \$5,000 (RTRAN)

Expanded Hard-to-Reach Efforts

Over the years, many stakeholders have stressed the importance of ensuring that that the vulnerable and less affluent portion of our population are not further burdened by the potential cost of moving to 100% clean energy. Recently, Aloha United Way's (AUW), *Asset Limited, Income Restrained, Employed* (ALICE) Report¹¹ identified that 48% of Hawai'i households either live below the poverty line or are considered ALICE families.

ALICE families have income above the Federal Poverty Level (FPL), but not high enough to afford a basic household budget that includes housing, child care, food, transportation and health care. ALICE households live in every community in Hawai'i – urban, suburban and rural – and they include women and men, young and old, all races and ethnicities. In Hawai'i, there are 165,013 ALICE households (37% of total households), while another 47,066 households (11% of total households) live below the poverty level. More than one-third—37 percent—of senior households in Hawai'i qualify as ALICE. Probably the most concerning figure is that 48 percent of Hawai'i families with children have income below the ALICE Survival Budget.

AUW noted that the most common approaches to overcoming ALICE barriers are short-term efforts such as temporary housing, child care assistance, meals, rides to work and caregiving for ill or elderly relatives. Although important, these short-term relief efforts are not designed to move households to long-term financial stability.

Incorporating long-lasting change would fundamentally change the way these families make ends meet. The installation of energy efficiency measures, either via kit distribution or direct installation, that will reduce these ALICE households' energy bills today and for the future is one, fundamental long-lasting change that can happen. With nearly half of our population not having enough income to afford a basic household budget, we have an obligation as a State to ensure working individuals and families can stay in their homes and pay their energy bills.

Current assistance funding through the Federal LIHEAP (Low Income Home Energy Assistance) program includes assistance to offset energy bill costs as well as a one-time Emergency Crisis Intervention (ECI) to restore or prevent termination of power to the residence. The Hawai'i Energy programs are well positioned to take on more of a role next year and in the future 3-year program cycle to work with the various agencies for a coordinated approach to recipients of this funding to provide energy and financial literacy and reduce recidivism for the ECI payments. By providing this coordination, distribution of measures and holding educational workshops (in-person or to a group), the programs can ensure these communities reduce their energy costs and directly receive the benefits of the energy efficiency investments available to all customers, especially those most at risk, while we transition to a 100% clean energy future.

The Public Benefits Fee (PBF) is one of several areas that can help address the equity issues, but it will need to come with changes in metrics on how the PBFA is measured. While a significant shift would not happen

¹¹ https://www.auw.org/alice

until the next 3-year program cycle, reaching this community requires focused efforts around identifying participation barriers and working with community partners to find more effective ways of reaching these families. As all stakeholders involved in the Program recognize and acknowledge this need for increased resources, our current team will continue to stay engaged to the extent we can with various existing working groups to help us in better future program designs and metrics to ensure we are serving this population of our community.

Key Partners:

Aloha United Way and the over 330 agencies which they serve.

PY18 Initiatives:

Coordinated efforts with Aloha United Way and Other Community Based Organizations

Hawai'i Energy has a long history of partnering with community based organizations to help fund the installation of energy efficient equipment for families in need. Over the years, we have partnered with organizations administering utility bill assistance programs like LiHEAP and have been able to provide some targeted relief by installing solar water heaters and high efficiency appliances. Since the release of the ALICE Report, we have been meeting with Aloha United Way staff to identify ways Hawai'i Energy could target customers reaching out to their 211 hotline for utility bill assistance. We have identified some possible pathways to further intervention in the form of energy saving kits with educational literature as well as some customized community based approaches. Hawai'i Energy will also be providing their call center with our program information and specific offerings so that they can assist callers as soon as they reach out. By listening and tailoring approaches specific to their needs, Hawai'i Energy will connect with customers in deeper, more meaningful ways.

Desired outcomes:

- Reduce overall monthly cost of utilities for ALICE population and the organizations that serve them through increased participation in Hawai'i Energy programs, both incentives and education
- Leverage Aloha United Way's reach and connection to those needing help reducing their utility bills

How this will influence future program design:

- Determine how this effort might be scaled with other organizations serving the ALICE population and the Aloha United Way
- Better understand the barriers that are making this a hard to reach market to help identify solutions for future program design

Nonprofit Package

Nonprofits in Hawai'i address community needs across many market sectors. They often operate with limited budgets and struggle under high operating costs that affect their ability to provide high-quality services. Hawai'i Energy has found that this situation often creates pressure to reduce costs quickly and, when combined with minimal knowledge of energy-saving options, many nonprofit decision-makers often do not consider energy efficiency or conservation as a viable option, when in reality it should be the first step. In PY18, Hawai'i Energy will roll out its Nonprofit Package to support 3-5 organizations in executing energy efficiency projects and reducing their operating costs. We will go beyond our traditional incentive programs and package several, specialized services to carefully and effectively address the needs of nonprofits in Hawai'i. We will provide education on the "efficiency first" model and provide technical guidance through project execution. Nonprofits will apply to participate in the program, which will offer a

required introductory workshop that covers analysis of their electric bill including load profile and demand charges, information on efficiency and renewable generation, and best practices for engaging with contractors. They will receive a facility walk through and basic audit review. We will then support their development of a contractor RFP and fully fund a lighting retrofit from their selected contractor. After installation, Hawai'i Energy will provide bill analysis for three months following project completion.

Desired Outcomes

- Support community based organizations by helping them reduce their operating costs.
- Connect contractors with customers through RFP process.

How this will influence future program design

• Test viability of this model to increase participation from nonprofit organizations.

Estimated Budget: \$49,000 (BHTR)

2.2 Additional Funding For Continued Program Evolution

The continued program evolution outlined in this section is the beginning of a 12-month process to collaboratively work with our clean energy stakeholders around new program designs for the next three-year cycle - beginning July 2019. In order to successfully implement the efforts outlined in this section, along with the anticipated shifts in program design and metrics, the Annual Plan's budget reflects additional funding for a Project Manager to oversee this work.

Adding this position is important. Staffing levels were significantly reduced in this current three-year cycle as a result of the reduced budget, leaving minimal capacity for initiatives beyond current resource acquisition and transformational program activities. Additionally, in PY17 there has been a significant increase in EM&V work and activity when compared with the previous year, around a 30% increase in program staff hours to date. The combination of these two aspects makes it challenging to allocate staff away from resource acquisition in the final year of the program cycle. The Annual Plan budget reflects an increase of \$95,000 for this position.

Some of these new demonstration program offerings will require additional metering, new educational materials, or incentives in order to make it a success. The goal of these new program offerings is to be able to scale a broader rollout in the next three-year program cycle based on what information and data we collect, as well as incorporate lessons learned through the activities in PY18. The Annual Plan budget reflects an increase of \$80,000 for these items to support an effective rollout of the programs detailed in section 2.1.

Lastly, the Program would like to measure the effectiveness of the branding campaigns conducted in the current three-year contract period to determine the level of investment for the future three-year contract period. As PY17's ad campaign received numerous best in class Pele Awards (the Hawai'i district competition of the American Advertising Federation), the Program would like to gauge the impact of this campaign in a timely manner, as the campaign ended this year.

In addition to comparing awareness levels to those in previous years, the Program would also commit to collecting data through this research on behavior change and specific energy or sustainability-related messaging as these components can also play a crucial role in how the Program develops its marketing strategy in the years to come. National research has indicated lately a shift in consumer behaviors around energy-saving products and services, and the Program would like to explore if current efforts and messages are on par based on local data or if there is a need to change how we encourage local ratepayers to adopt clean energy practices. The Annual Plan budget reflects an increase of \$75,000 for this market research initiative.

2018 Pele Awards Received for Hawai'i Energy's PY17 Brand Campaign

People's Choice Award

- "Stop Energy Waste" TV Campaign

Pele Gold

- "Stop Energy Waste" TV Campaign Over \$50K
- "Stop Energy Waste" TV Campaign Animation, Special Effects + Motion Graphics

Silver

- "Stop Energy Waste" - Integrated Branded Content Campaign

Bronze

- "Pennies" Floor Graphic Outdoor Board
- "Stop Energy Waste" TV Campaign Voice Over

Additional information about the campaign will be covered in the PY17 Annual Report.

3.0 MARKETING & COMMUNICATIONS

3.1 Branding

An organization's brand goes far beyond its visual elements; it is also the foundational principle(s) on which an organization's culture, values and communications are all developed. A significant investment in branding efforts in PY17 was crucial in not only garnering more exposure, but positioning the Program as a credible, trusted source of energy efficiency information and a key player in Hawai'i's clean energy movement.

With such a large customer base and a mission to empower *all* residents and businesses to play a part in efficiency, it will take a while before Hawai'i Energy reaches full market saturation and becomes a "household name". Attention spans are shorter than ever in today's world, which means that repetition and impactful, memorable messages are both important in staying top-of-mind for consumers who are served massive amounts of information daily. As a public service program, Hawai'i Energy's branding efforts are also about building and maintaining public trust – incredibly difficult to gain and easier to lose – which is why the time taken to develop and execute a defined, long-term brand strategy has been necessary to overall Program success.

In PY18, Hawai'i Energy will build on the success and momentum of last year's branding work, refining the most the effective elements and leveraging strong relationships to take our message further and deeper.

Re-Runs of Advertising and Other Attention-Grabbers

In collaboration with creative partner Wall-to-Wall Studios, the Program will deploy a repurposed advertising campaign that builds off the storytelling done with last year's "Outlets" 30-second TV spots and outdoor ads. This campaign will be driven largely in part by market research data and results of the PY17 campaign to maximize the budget, and the Program will also research and capitalize on opportunities outside of the structured campaign to gain further (free or low-cost) exposure in other media outlets.

After the last eight months of testing, Hawai'i Energy also plans to enhance its mascot "Pluggy" in PY18 with a fully-developed curriculum and regular schedule of appearances. Debuting at such events as the Diamond Head Classic basketball tournament and Energy Efficiency Celebration at Tamarind Park last year, Pluggy has received overwhelming positive response and become a popular, recurring presence in Hawai'i Energy's video and social media content. The team has developed and refined procedures for operating Pluggy and the costume has since undergone strategic edits to improve and refine his appearance. The next step for Pluggy will be to solidify his performance routine and market him to local schools, community groups and events, with the intention of exposing younger and/or different audiences to energy efficiency messaging.

PY18 (2019) also marks the Program's 10th year of providing services, and a plan to celebrate and market this momentous achievement is already under way. This occasion is a perfect opportunity to expand on branding efforts, call attention to the state's work toward the 100% clean energy goal and raise the level of energy literacy across the state. A year-long campaign will honor the contributions and share the success stories of people who have participated in Hawai'i Energy's offerings. The Program plans to incorporate a 10th anniversary theme throughout public-facing communications, host events, leverage connections to garner earned media, and produce and distribute digital content specifically around the theme.

Legislative & Stakeholder Outreach

A vital component to Hawai'i Energy's success is collaboration with forward-thinking stakeholders and informing community leaders about best practices on how to achieve increased energy efficiency. While

Hawai'i Energy is prohibited from engaging in lobbying activities, we believe it is in our best interest to reach out to policy makers to educate and guide them on how specific proposals may affect our state's energy saving efforts and perhaps point out any unintended consequences.

Earning more brand recognition over the last year has aided the Program in conducting strategic outreach to key stakeholders in Hawai'i's business community, policymakers in particular. Thus, Hawai'i Energy will continue dedicating time toward engaging with elected officials and other policymakers in PY18 through targeted events, including attendance at the Hawai'i State Legislature's opening day open house (focusing on meeting members of the two energy-related committees and newly-elected members) and partnering with other community organizations to host public forums with elected officials in attendance.

Digital Content Creation

One of the Program's biggest assets is its ability to produce high-quality, engaging, informative digital content, comparable to even some of Hawai'i's leading media outlets. Producing content in-house allows the Program to keep costs down, and an emphasis on distributing content online through our website, emails and social media has allowed those platforms to flourish, and the Program to cultivate a strong following of people who are on board with efficiency/sustainability messaging.

In PY18 the Program looks toward finding ways to strategically expand this community, using the momentum and "buzz" garnered from the brand campaign. Having undergone major website and social media improvements in design, functionality and content throughout the last year (with more on the way), the Program is in a good position to start driving more users to each of these platforms. The Program will explore outreach to local social media influencers, seeking ways to further share our message, and also to gain valuable insight into best practices for digital content management.

In addition, *Hawai'i: Energized*, the Program's growing educational web series has become a well-known fixture amongst the energy community for its fresh content and fun approach to breaking down the often difficult-to-understand concepts of energy efficiency for local audiences. The show this year caught the attention of producers of local lifestyle show *Living 808* on KHON2 and beginning in PY18, the Program will produce a monthly *Hawai'i Energized* segment on Living 808, which will also be counted toward the Program's Transformational metrics. Each episode, in addition to 2x/day airtime on KHON2 and affiliate stations, will also receive monthly 0:10 billboards, promotional segments 10x/month and year-long exposure on KHON2.com and KHON2's social media networks.

3.2 Key Priorities for Marketing Residential Programs

The residential marketing strategy will continue to refine existing strategies and leverage the success of the brand awareness campaigns to drive rebate offer participation. As the energy-efficient product market continues to evolve, the Program must do what it can to stay ahead of the curve and encourage smart purchase decisions. In addition, the Program also recognizes the need to intensify efforts to reach segments of the population that are better served through non-incentive initiatives – such as the transformational program initiatives that target underserved communities – in order to ensure all residents have access to energy-efficiency measures. Key strategy areas for PY18 include:

- Continued use of **data analytics** to identify and target high-quality, cost-effective leads with customer segmentation;
- Identifying the "hard to reach" customer population with the same analytics approach while leveraging community partners to complement Transformational programs;

- Leveraging local, regional and national supply chain relationships to affect program uptake;
- Utilizing **mass marketing tactics** such as email and print ads to our established customer lists with a playful and informative messaging tone;
- Supporting Transformation program efforts **using contests and gamification** to increase education, participation and adoption.

Data Analytics for Customer Participation and Engagement

In PY17, the Program targeted likely participants using a model based on participation in Hawai'i Energy's most utilized programs combined with customer demographic information. The campaign had a multiprogram approach to promote a wide variety of Hawai'i Energy offerings and tested the success rate of different types of direct mail. These findings will be used in PY18 direct mail marketing to ensure the most cost-effective mail campaigns and drive participation in the rebate offers.

Additionally in PY18, a similar analytics approach will be used to identify customer segments that have not participated in programs, to focus on targeting the "hard-to-reach" customer base. Together with Transformational initiatives and community partners, the marketing objective is to reach customers yet to participate in any of our programs, while simultaneously targeting customers who are likely to participate as noted above.

Leveraging Supply Chain Partners

Hawaii Energy's array of consumer programs allow us to grow relationships with the manufacturers, distributors, retailers and contractors bringing energy-efficient devices and appliances to Hawai'i shores. Keeping these Clean Energy Allies engaged and informed of program benefits, new information and offerings to help, and promoting them in conjunction with Transformational offerings helps them drive their business and create the desired product mix for Hawai'i consumers.

Support for supply chain Allies in PY18 will include: leveraging Hawai'i Energy's status as a national ENERGY STAR® Partner and the highly-recognized ENERGY STAR brand; providing joint/cooperative advertising opportunities for newspaper inserts, floor signage and special promotions; and a continued investment in Hawai'i Energy's online Energy Marketplace, which allows customers to purchase smaller measures directly from our website at a discounted rate for added convenience or that are difficult to find on local store shelves.

Lastly, working with other local partners such as Sustainable Moloka'i or Pūlama Lāna'i, allows us to gain greater recognition in a cost-effective manner.

Mass Market Tactics

The use of digital marketing is an increasingly important way to reach consumers. With email communications seeing a steady increase in engagement throughout PY17, we will continue a monthly email cadence that alternates between a program-oriented, promotional message and an educational tips newsletter to inform and engage Hawai'i customers to march toward our clean energy goals. Other mass media tactics such as print ads continue to also be an effective way of creating awareness and complimenting other marketing initiatives to drive residential program participation.

Marketing Transformational Efforts

Increasingly, marketing to the residential sector is one and the same with our Transformational efforts as the portfolio evolves from cheaper and easier to get resource acquisition (kWh savings) to education and

outreach efforts to all. Strategies within the Transformational program such as contests and gamification to increase program awareness and e-newsletter sign ups proved effective in PY17 and will continue in PY18. Marketing will support Transformation in the areas of outreach, event management and promotion, enhanced engagement and any other effort which involves dissemination of program/incentives information and education.

3.3 Key Priorities for Marketing Business Programs

Hawai'i Energy continues to adapt to a changing commercial efficiency market. As we enter our 10th year, it is as important as ever that we build meaningful relationships with customers to increase the chances of project sustainability. Below are the key Marcom strategies for supporting business program operations in PY18:

Continuing Sector-Specific Initiatives

The Program's PY18 marketing and communications strategy for supporting its business resource acquisition goals will dig deeper into maintaining a sustainable pipeline of energy efficiency projects in every sector, especially where the Program needs to encourage larger investments, going beyond the "low-hanging fruit" of opportunities, and increasing access to businesses who face exceptional and unique barriers to implementing efficiency.

Driving customer demand through targeted marketing will be a major focus in PY18 and a key component in sector-specific marketing initiatives. To ensure that limited resources are available to those who need it most, the Program must look for ways to better complement the work being done by trade allies and place emphasis on reaching customers who require more customized assistance.

We will continue work started in PY17 to collect data on customers' motivations, challenges and preferred communication methods, and will work toward implementing ways to routinely collect this information (e.g. surveys, referral mechanisms, etc.) to inform marketing decisions. With this data as the starting point, the Program will also continue developing tailored content and sales tools for Hawai'i Energy Advisors and Clean Energy Allies to use while in the field, which will include updated/simplified language, new digital assets, print collateral and web content personalized to each market sector based on their needs and feedback.

Small Business Program Refresh

One significant area where this will be applied is with the small business direct install lighting offer. Though the offer is not the most cost-effective, it is an important one to provide, and Hawai'i Energy hopes to make it available to more customers (albeit through potential incentive rate reductions). The Program took a deep dive into improving this offer in PY17, soliciting feedback from contractors, internal staff and external stakeholders to help refine back-end processing, invest in new tools and identify ways to expand reach while still providing support to installation contractors and maintain their engagement and support for the program. Through this exercise, both contractors and internal staff identified challenges in garnering new participants for the program, such as difficulties in transitioning from the free to co-pay models (as many leads are referrals and come with the expectation of free retrofits) and overall low levels of awareness of the offer. Based on this feedback, the Program's marketing strategy around the small business offer will shift in PY18 to focus on increasing general awareness of the offer with the most updated information (i.e. the copay model), in hopes of eliminating the expectation that the offer is free while concurrently driving customer demand.



Results from poll taken at Hawai'i Energy's small business lighting contractor meeting in February 2018 asking participants to vote on a potential new brand concept for the current lighting offer.

The offer will be re-launched in PY18 with a new name (selected with staff and contractor input) and

marketing materials, as well as the deployment of a targeted, year-long marketing campaign, which may include, but are not limited to the following tactics: direct mail pieces, referral capture mechanisms, and earned media spots.

Nonprofit Incentive Program Startup

Marketing and communications will also play a large part in the launch of our new nonprofit program in PY18. (See details in section 7.0). Given that the incentive offering will be unlike any the Program has ever done – implementing a cohort structure and integrating an educational workshop component – the marketing strategy will be focused on recruiting and selecting quality applicants and ensuring participants are engaged and supported throughout the year-long program. Targeted outreach to professional associations, board members and the nonprofits themselves will be a primary emphasis, as well as the investment in sharing each nonprofit's journey with a public audience through digital content and media exposure.

Fostering Opportunities for Relationship-Building

Another key advantage in supporting the Business program is the Program's increasing ability to foster meaningful relationships in the business community through events. Led by the marketing and communications team, Hawai'i Energy will continue to participate in a wide variety of trade shows/expos and industry conferences throughout the year, as well as evaluate partnerships with professional groups to allow team members to network and promote offerings to new audiences.

Furthermore, in line with remaining a trusted advisor, the Program will also invest in providing its own platforms for connections and sharpening strategies around hosting events like the yearly Clean Energy Ally kickoff, educational Lunch & Learn and coffee hour sessions, and the Innovation Symposium. Hawai'i Energy will continuously work to improve efficiencies in coordinating these events, ensure they are designed based on community needs with stakeholder input, and remain cognizant of how these events fit into the overall Transformational program strategy.

4.0 CLEAN ENERGY ALLY PROGRAM STRATEGY & DETAILS

4.1 Overview

The Clean Energy Ally (CEA) program acts as a force multiplier for participation in Hawai'i Energy's programs. Currently, over 285 companies participate in Hawai'i Energy's Clean Energy Ally program. The CEA program supports and leverages architects, engineers, contractors, manufacturers, and distributors to efficiently and costeffectively increase program participation from both commercial and residential customers. Clean Energy Allies have a close connection with the end-use customer and play an important role in educating them on the benefits of energy efficiency and participating in the Program's commercial and residential offerings. While the Hawai'i Energy program supports Clean Energy Allies through its transformational program offerings, the impact of the Clean Energy Allies on our resource acquisition programs makes the CEA program a unique point of emphasis beyond traditional transformational offerings.



Our team also relies on CEA feedback to help us improve program design and increase participation in our incentive programs. Leveraging our market multipliers helps us lower the total cost of delivering energy efficiency to customers. In the coming program year, we intend to continue recruiting new Allies and deepen relationships and engagement with existing Allies through expanded and improved program offerings.

Supporting Market Multipliers

Clean Energy Allies help build and support a strong delivery market infrastructure to best serve Hawai'i ratepayer needs with energy efficiency options. Many of Hawai'i Energy projects are completed in collaboration with our Clean Energy Allies and we anticipate an increase in coordinated efforts in PY18.

Removing barriers to program participation by recruiting and motivating allies to become active participants in Hawai'i Energy programs are important objectives of the Clean Energy Ally program. The Program actively evaluates and refines the benefits for Clean Energy Allies to ensure they are thoroughly supported. Current benefits include marketing and outreach co-op funding, access to technical support, invitations to networking events and educational opportunities such as technical trainings and professional development courses augmented with professional sales tools. A Clean Energy Advisory board was established in PY16 to provide a channel for feedback and new ideas; the Program used that feedback in PY17 to expand offerings to best benefit Allies and will continue the efforts in PY18 to garner more program feedback.

Figure 4 - Examples of Ally Feedback and Program Response

| Ally Feedback | Program Response |
|---|---|
| Allies cited affiliation with Hawai'i Energy as beneficial and important to their marketing efforts | Continue to grow the co-op funding program by assisting Allies with marketing planning, media buying and development and design for advertisements and include support for other types of events. |
| and desired more assistance. | Launched the "Energy Insiders" Reward Program in PY17 to highlight the most active and participatory CEAs. |
| Allies requested more in- | Hosted inaugural Innovation Symposium in April 2018. Attended by almost 200 people with more than 20 exhibitors, the one-day conference featured a number of energy-related seminars and focused on connecting customers and clean energy allies. |
| person interaction with Energy Advisors and customers. | Continue "Cup-of-Joe" ¹² coffee hours (began in PY16 and continued throughout PY17) and focus on specific sectors throughout the program year in order to determine potential project opportunities. Coordinate with Allies to host "Lunch n Learn" ¹³ presentations for Energy Advisors to educate and showcase emerging technologies in energy efficiency with operational applications. |
| Allies requested increased general training on the Hawai'i Energy program. | Continue with "Lunch n Learn" opportunities on Hawai'i Energy Program training. Implement livestreaming to accommodate outer island CEA's and online, on-demand Hawai'i Energy program training accessible via the Hawai'i Energy website. Training topics will address Allies' questions on incentive amounts, filling out applications and worksheets and how to best take advantage of Clean Energy Ally benefits. |
| | The Program will also monitor the roll out of the new CEA website portal with program resources and tend to feedback for future refinement of the online enrollment process. |
| Allies requested additional training around energy efficiency technologies and financing for themselves and customers. | Continue with professional workshops such as "Advanced Solid-State Lighting Design & Lighting Controls" by Illuminating Engineering Society. This professional workshop provided the latest advances in LED lighting design and state of the art technologies to Allies from various types of services such as design, distribution and installation. Coordinate training workshops with Small Business Administration and other government entities such as USDA and Hawaii Technology Development Corporation to educate Allies on programs and grants available for energy efficiency endeavors. Awareness of government sponsored programs will enable Allies to educate their customers in pursuit of energy efficiency projects. |

¹² "Cup-of-Joe" is a casual event hosted by Hawai'i Energy at a local coffee shop designed to deepen relationships with trade allies and answer program related questions.

¹³ "Lunch and Learns" are structured learning events provided to or by CEA's that cover technical trainings, Hawai'i Energy program trainings, or other customer-focused events. Learning events typically occur during lunch hours with food sponsored by Hawaii Energy.

Deepening Industry Engagement

In PY18, Hawai'i Energy will further strengthen its presence in the marketplace by building upon relationships with professional trade organizations, manufacturers, distributors, designers, retailers, installers, and service technicians through:

- Hosting the second annual Innovation Symposium to educate customers and allies on energy efficiency solutions and create opportunities for CEA's and potential customers to connect and exchange ideas and information;
- Working with manufacturers, distributors, and suppliers to promote program benefits to potential participants;
- Sponsoring networking events to create opportunities in developing connections with professional organizations such as Chamber of Commerce Hawai'i, Filipino Chamber of Commerce and Japanese Chamber of Commerce. Additionally, working with the Japanese Chamber of Commerce on a committee focused on energy and climate change;
- Collaboration with manufacturers regarding emerging and rapidly advancing efficiency technologies such as lighting controls and building automation systems and) for continuous commissioning. This includes staff training sessions on new technologies and attendance at industry trade shows.
- Engagement with building designers to support customer education and engagement with the value of energy efficiency early in the design cycle;
- Support for large retail management and merchandising teams to ensure implementation of promotional agreements established at the corporate level;
- Engagement with various industry associations that are unique to specific market sectors, such as the local chapter of the Building Owners & Managers Association, Hawai'i Water Environmental Association and the Green Hotel Forum in order to reach potential customers within the respective sector;
- Assistance to local, independent retailers and distributors including point-of-purchase collateral, product knowledge training and professional sales training; and
- Leveraging relationships with distributors, suppliers, manufacturers, and service vendors to maintain awareness of the needs of the HVAC supply chain.

Building Workforce Capacity

The foundation of an energy-independent Hawai'i will be dependent upon the skill set and knowledge of the workforce capacity in energy efficiency and conservation.¹⁴ To best support this, a main goal of the CEA program is to increase the base of qualified contractors and augment the skill sets to implement clean energy and energy efficiency projects, products and services. This in turn will help Allies successfully educate and support their customers improve their energy efficiency operations through energy-saving projects. Improving Allies' ability to serve customers by implementing energy efficiency measures will improve the growing economic engine of our State as well as help customers reduce their energy costs.

As in previous years, we will focus on providing educational opportunities to Allies through technical trainings, Continuing Education Credits and professional sales training. We will continue with these initiatives in PY18 as they allow Allies to gain a competitive edge by obtaining knowledge, resources and

¹⁴State of Hawai'i, Hawai'i Clean Energy Initiatives. *Goals and Objectives*, 2018.

credentials that enable them to deepen their service offerings and customer base. See section 5.0 for additional details on professional development and technical training initiatives.

Energy Insiders Rewards Program

In an effort to enhance the Clean Energy Ally experience in PY18, Allies will be eligible to participate in the "Energy Insider's Reward Program" which was launched in PY17. This program will recognize and reward Allies who achieve a high volume of project completion throughout the year and will reward them with a Gold listing status that will be shown on our updated online vendor directory. Benefits of the listing include: access to cross-networking opportunities, additional marketing support and funding for co-op events and advanced training opportunities. In addition to this, we are exploring recognition of exceptional achievement in efficiency projects through other means like social media, highlight videos and at an end-of-year award ceremony.

Emerging Technologies

In PY18, Hawai'i Energy will continue to explore and assess emerging technologies proven to be cost effective and practical to Hawai'i's business standard of operations for various market segments. Relationships with key Allies will help inform the Program on emerging technologies and provide input and ideas to design future program opportunities. This information combined with the partnerships we have in place with Elemental Excelerator and Vermont Efficiency Investment Corporation, to name a few, along with groups such as NYSERDA and Southern California Edison will help inform the program.

We will leverage the existing CEA advisory board with vendors that represent technologies that interface within facility operations. Our involvement with the CEA advisory board will enable the Program to stay abreast on the application of emerging technologies for energy efficiency.

5.0 TRANSFORMATIONAL PROGRAM STRATEGY & DETAILS

5.1 Overview

Market transformation programs provide strategic interventions in the market in order to create lasting efficiencies and pave the way for the integration of clean energy solutions. To affect long-lasting and meaningful change, transformational strategies lay the foundation while removing the barriers for customers to make smart energy choices and increase adoption of energy efficiency practices. Hawai'i Energy's Transformational program complements, and in some cases, merges with Resource Acquisition programs to provide a more comprehensive approach in reaching residents and businesses. This is accomplished through education to residents, training and provision of energy solutions for businesses, adoption of enhanced building energy codes, collaboration with public and private sectors, community based energy efficiency efforts, and review of Hawai'i's innovative emerging technologies.

Notably in PY18, Hawai'i Energy is investing an additional \$400,000 in Transformational program initiatives. This is a 23% increase in Transformational funding from the PY17 Annual Plan budget and demonstrates the importance of these programs in affecting long term change. In addition, this funding allows us to go deeper in the key program evolution areas identified by stakeholders during PY17.

In PY18, the Hawai'i Energy transformational program will include the following focus areas:

- **Behavior change** initiatives targeted to specific sectors with an emphasis on hard-to-reach and youth audiences
- **Professional development & technical training** for Clean Energy Allies, energy managers, facility operators who buy and/or operate equipment, educators, and others who influence decision making.
- **Energy in decision making** for serving specific communities and large energy users in developing comprehensive energy management strategies to incorporate into business practices.
- Codes and standards support to drive energy savings in both public and private sectors.
- **Clean energy collaboration** with the utilities, the PUC and other public and private stakeholders.

For transformational initiatives targeting residential customers, a special emphasis will continue with hardto-reach communities, described as the low-income, underserved, vulnerable and/or geographically isolated populations. These populations pay a higher percentage of their monthly expenses for utility costs as compared to other residential demographics and will realize a more significant benefit from energy usage reductions. Factors for success will rely on regular coordination and teaming up with various stakeholders, simplifying program design for ease of participation, developing market segmentation, and prioritizing measure offerings.¹⁵

In order to maximize program effectiveness, Hawai'i Energy continues to engage with other energy efficiency programs to compare engagement approaches and lessons learned. Currently, we are active participants in ACEEE's multifamily working group that connects implementers throughout the country specifically on topics to address underserved renter populations. See section 6.0 for more information on the residential hard to reach efforts.

¹⁵ Gilleo, Annie, Nowak, Seth, and Drehobl, Ariel. *Making a Difference: Strategies for Successful Low-Income Energy Efficiency Programs*. ACEEE Report Number U1713, Oct. 2017.

Business transformational efforts will focus on diversifying training opportunities for customers and trade allies. This includes building on the success of programs initiated in PY17, like our Innovation Symposium, and growing impact in new sectors like the commercial real estate industry. We will invest even more resources in our Strategic Energy Management efforts in order to catalyze additional customers to achieve energy savings through sustained organizational change (behavior and work processes) rather than discrete, energy-saving projects.

For additional information on the focus areas as well as historical context on market transformation efforts, visit Appendix D.

5.2 Behavior Change

Building on a strong foundation of existing energy education programs (i.e. workshops, presentations, videos, etc.), Hawai'i Energy will leverage the relationships and networks of community affiliates and advocates to influence behavior change in targeted residential hard-to-reach and youth audiences across its service areas. The following outlines the PY18 portfolio of planned behavior change offerings:

Community Workshops and Presentations

In PY18, Hawai'i Energy's community workshop series will continue to deploy multiple local presentation approaches, each providing a blend of financial and energy education with a fun, creative, relatable delivery style. Workshops will include innovative formats to increase attendee participation using enhanced engagement techniques through gamification platforms and other complementing visual tools. The focus will be on target hard-to-reach community organizations, local businesses, and agencies that provide access to large groups of residential customers.

In addition, the Program will continue to support collaborative efforts to raise awareness and educate the community about energy efficiency in PY18. This will include sponsorship of activities that reach specific educational and nonprofit groups who will go on to educate their peers and broader community about the importance of energy conservation and efficiency.

Youth Energy Education and Events

Prior program years broadly incorporated youth education into the overall Community Workshops and Presentations program. In PY18, youth education will be segmented out as its own initiative with specific goals to target students at K-12 schools and community youth based organizations. Engagement strategies in this area will utilize existing statewide curriculum initiatives in science, technology, engineering, mathematics (STEM) and provide funding support for related events. We will continue to support organizations like Honolulu Theater for the Youth (HTY), who provide youth energy education through fun and creative messaging in theater and drama. Hawai'i Energy will continue to sponsor HTY's *Shocka, The Story of Energy & Hawai'i*, as it goes statewide to reach an additional 10,000 students in the fall of 2018. We will also provide funding support to enable student access to more advanced energy industry conferences to help them gain exposure to critical policy and regulatory issues.

Enhanced Engagement

Enhanced engagement strategies create better interactions with customers, keeping people interested in energy efficiency concepts and provide multiple touchpoints. When executed effectively, enhanced engagement practices, like the gamification of energy efficiency and conservation concepts in a microsite platform and/or development of interactive tabling displays, motivate participants while establishing a shared sense of purpose reaching a common goal.

In PY18, enhancement engagement metrics will fold in gamification and will replace the digital engagement focus area from the prior program year. Digital engagement campaigns, such as social media and mobile messaging will be directly aligned under marketing initiatives and enhanced engagement strategies may be interlaced into marketing tactics across the portfolio. Enhanced engagement will be a transformational goal with participant metrics designed to build audiences and create deeper interactions to effect long lasting or permanent change in participants' energy choices.

5.3 Professional Development & Technical Training

The Program continues to focus on technical training and professional development to create a workforce knowledgeable in energy efficiency. Our proposed initiatives in this area increase the core competencies for Clean Energy Allies, decision-makers, influencers and operators. Our approach addresses both the current (buyers and sellers) and future (students) market players to ensure the viability of long-term savings.

Clean Energy Ally Support

PY18 support will be primarily through education and training activities to ensure Allies have a firm foundation in Hawai'i Energy's program offerings and guidelines and that they benefit from preferential access to networking events, professional sales, technical and certification trainings. Since the programs continue to evolve in order to best align with market trends, Hawai'i Energy will host program training webinars as needed to review updates to qualified products lists and new incentive structures. Additionally, Ally-specific events like "Cup-of-Joe" coffee hours and recognition and rewards programs will continue to provide motivation for Clean Energy Ally participation and celebrate their accomplishments.

Targeted Ally Training Opportunities

Hawai'i Energy will also rely on industry experts to enhance the portfolio of training opportunities to advance Allies' knowledge base and reputation. Offerings will include energy efficiency sales training, technical training, and co-operatively funded learning events, where local or national experts may provide training in their areas of technical specialization and Hawai'i Energy may subsidize the costs. Some of these opportunities will include:

- Energy Efficiency Sales, Financial Analysis and Real Estate Training
 - Continued focus on tools, templates and case studies to support market penetration of effective sales techniques.
 - New in PY18, we will be expanding our sales training to engage both commercial and residential real estate communities.

• Innovation Symposium

- Building on the momentum from PY17's inaugural Innovation Symposium, we will host our second Innovation Symposium in PY18 with expanded content and more diverse speakers.
- Technical Training
 - Additional seminars on energy-efficient technologies and practices in conjunction with manufacturers, suppliers, universities and allies.

• Co-op Funded Learning Events

Continued efforts to partner with allies through lunch and learn and other co-op funded events to encourage more business-to-business and business-to-customer learning opportunities.

For more details, see section 4.0.

Targeted Participant Training Opportunities

We will continue to focus on enhancing the skillsets of facilities managers and decision-makers as they scope, approve, procure and manage energy-saving projects. Training will focus on both technical and business skills, including financial analysis and contracting basics.

- Technical Training
 - The Program will continue to offer the Building Operator Certification (BOC[®]) course, as well as collaborative training opportunities with industry organizations in the hospitality and small business sectors.
 - We will also continue to coordinate with the Department of Business Economic Development and Tourism (DBEDT) to reach state employees and building managers.
- Coordination with Federal Agencies
 - Hawai'i Energy will build on discussions with both the Small Business Administration (SBA) and the United States Department of Agriculture (USDA) to provide training and education on available federal grant and loan programs available assist with financing energy efficiency improvements.

Educator Training & Grants

In PY18, professional development workshops will be conducted across the islands at public and independent schools, conferences, STEM events, and student energy summits. Hawai'i Energy realizes there are many entities providing energy educator training and efforts will center on coordination of currently available educator programs in order to maximize and leverage the program budget while reducing overlap and confusion with teachers.

In particular, Hawai'i Energy will support the Hawai'i Department of Education (DOE) formally approved professional development curriculum on teaching energy concepts to educators. By participating in this curriculum, teachers will accumulate credits that count toward advancing their salary grade. This first of its kind accredited workshop utilizes an inquiry-based learning experience that translates directly back into the classroom and equips teachers the resources, knowledge and skills to innovatively teach Hawai'i's energy and energy efficiency concepts to students. The course workshop, *Teaching Energy with STEAM*, incorporates Science, Technology, Engineering, Art, and Mathematics (STEAM) methods that prepare teachers for the transition to the DOE's Next Generation Science Standards.

Energy Industry Workforce Development

Hawai'i Energy will continue with its fellowship programs, drawing high-caliber students and recent graduates into the energy industry, while providing cost-effective support to the Program. This year the Program will leverage energy intern funding from the National Association of Regulatory Commissioners (NARUC), secured in coordination with the Hawai'i Public Utilities Commission, to expand our reach. Fellows and interns will work on Hawai'i Energy programs as needed, including integrated demand side management (IDSM) collaboration efforts, direct-install programs for the hard-to-reach sector and the Clean Energy Ally Program.

We will also be expanding vocational training on the Island of Molokai in collaboration with Hawaiian Electric. As Molokai proceeds towards its 100% clean energy by 2020 target, there will inevitably be additional electric vehicles being utilized. Currently the infrastructure to support the increased use of EVs is limited and there are no companies/locations outfitted to properly maintain the growing fleet. At the request of Hawaiian Electric, Hawai'i Energy is well positioned to be one of several partners bringing this training to Moloka'i to expand its existing technical training offerings to include maintenance of EVs. These

courses would develop local workforce capacity to repair and service electric vehicles on island, further reducing the barriers to adoption.

5.4 Energy in Decision-Making

Community-Based Energy Efficiency

Hawai'i Energy recognizes the need for customer equity and the obligation to provide access to energy efficiency resources for all demographics, especially in hard-to-reach communities including low-income, underserved, and vulnerable populations. The American Council for an Energy-Efficient Economy (ACEEE) reports that low-income households pay a disproportionate amount of their income in energy costs, up to three time as much, compared to other higher-income households. Additionally, creating new programs that reframe energy efficiency for Hawai'i's ALICE population while allowing both community and student leaders to define their preferred areas of support were two key recommended actions that came out of our Stakeholder Meeting in February 2018.

In PY18, a renewed focus on engaging with community and student leaders will be to bring a holistic approach in identifying and reducing the energy burden for these hard-to-reach communities. We will work closely with community based organizations like Aloha United Way and the partners they support to identify communities to engage. By listening and tailoring approaches specific to their needs, Hawai'i Energy will leverage existing relationships with community-based organizations and other external resources to connect with customers in deeper, more meaningful ways. Using prior successes as a blueprint, a suite of resource acquisition measures from both the residential and commercial portfolio as well as transformational efforts will be offered to these communities.

Hawaii Energy has extensive experience working with various community-based organizations and state/local community action agencies (CAA) like the Honolulu Community Action Program (HCAP), Hawai'i County Economic Opportunity Council (HCEOC), and Maui Economic Opportunity (MEO). Understanding that these nonprofit entities face continual labor and funding constraints and/or limitations, Hawai'i Energy will devote much needed assistance and resources as a hands-on approach in all phases of project management from program conception and initial planning to execution and project closure. The increased commitment will bring a formalized coordination with external stakeholders, including the clean energy ally network, for building strong relationships and delivering consistent results to each community. See section 2.0.

Strategic Energy Management

Strategic Energy Management (SEM) and its associated Continuous Energy Improvement (CEI) offerings employ comprehensive services and engagement tools to assist end-use customers in making the best, factbased decisions concerning their energy consumption. PY18 efforts include a growing focus on the tenants of Strategic Energy Management (SEM) with key institutional customers including the City and County of Honolulu as well as enhanced engagement with commercial customers through data analytics and benchmarking. Initiatives will continue to be closely coordinated with business program strategies, and incorporate strategies and input received from our work with Vermont Energy Investment Corporation (VEIC), to ensure we are aligned with nationally recognized best practices. See section 7.0 and Appendix C for additional information on SEM and CEI. The following activities will fall under our Transformational SEM efforts in PY18:

• Staffing Grants

Additionally, Hawai'i Energy will provide financial support for SEM/CEI customers in need of additional staffing capacity. These grants will be used to offset labor costs in order to ensure that energy projects identified continue to move forward on the ground. Each staffing grant will be designed with specific deliverables that must be reached in order to receive program funding. We are also exploring innovative ways to package staffing support grants with reduced resource acquisition incentives to make the program as cost effective as possible.

Hawai'i Green Growth Sustainability Business Forum- Green Your Business Initiative
Hawai'i Energy will support Hawai'i Green Growth's Sustainability Business Forum- Green your
Business Initiative by offering and introduction to CEI for businesses so that they can begin to
incorporate a more holistic approach to energy management in their business practices. The
Sustainability Business Forum (SBF) brings together top level executives representing a broad sector
of Hawai'i businesses committed to achieving economic prosperity, environmental stewardship and
community resilience.¹⁶

Rural Water and Wastewater Support

In PY18, Hawai'i Energy will coordinate with the Hawai'i Rural Water Association (HRWA) to assist small community water and wastewater utility systems by providing funding for a comprehensive energy assessment. These assessments will utilize water and electrical monitoring equipment Hawai'i Energy provided to HRWA in PY15 to audit selected water and wastewater system pumps and motors and evaluate equipment performance and efficiency. A review of the systems leak detection and water audit programs will also be included (if applicable) as part of the assessment. Data summary and findings to be reported with recommended energy efficiency improvements such as higher efficiency pump replacements or using a variable speed drive to meet varying load conditions, pump check valve replacements, implement or improve systems leak detection and/or water audit programs. Hawaii Energy will help to offset the costs of upgrades identified with incentives and work with federal partners like the SBA and USDA to identify financing opportunities.

Data-Driven Customer Engagement

Hawai'i Energy continues apply a data-driven approach to increase customer engagement. Building on the benchmarking efforts initiated in PY15, we have expanded use of data visualization tools to provide powerful charts and reports to engage customers in a deeper dialogue. Benchmarking efforts targeted K-12 schools, hotels, movie theaters, retail and grocery stores. PY17 data analysis expanded energy usage reports to a number of Schedule J customers that have not participated in the programs. In PY18, we will continue to use benchmarking and deeper modeling of building energy use to further capture insights and energy savings.

5.5 Codes and Standards Support

As we look to the future, Hawaii Energy recognizes that enhanced building codes and standards will provide a significant foothold for advancing energy efficiency in Hawai'i and we will continue to play a leading role in critical areas of successful enhanced code implementation. In PY18, proposed codes & standards activities are designed to actively encourage counties to adopt the 2015 IECC, support compliance to the new energy code, and provide a forum for dialogue around leading-edge strategies through the energy code process. Additionally, the commercial Program will continue to ratchet up minimum efficiency levels

¹⁶ https://hawaiigreengrowth.org/blog/149-sustainability-business-forum

required to receive incentives. This allows the Program to have meaningful dialogue with equipment distributors to minimize free-ridership and ensure Hawai'i Energy rebates continue to move the market.

PY18 Codes & Standards Actions

• Support adoption of IECC 2015, with Hawai'i amendments, in all counties.

We will continue to work with key stakeholders including county energy managers, the Department of Business Economic Development and Tourism (DBEDT), and the Blue Planet Foundation (BPF) to generate the necessary county-level support for adoption of the code.

• Improve energy code compliance

Using initial research into current levels of code compliance in both the residential and business sectors, along with a new study intended for publication by summer 2018 with a statistically significant analysis of state-wide energy code compliance to both IECC 2006 and 2015 levels, the Program will develop strategic interventions to prepare the industry for seamless compliance to the 2015 IECC.

• Standards Enhancement

In an effort to push standards along, one strategy Hawai'i Energy has and will continue to implement, is the requirement that new chillers exceed the IECC 2015 Energy Code minimum efficiency levels. Savings are based on newly installed equipment efficiency compared to a minimum baseline code. It is assumed that chillers being replaced are nearing their end of useful life which is between 15-25 years. The current minimum baseline code should therefore be higher than previous performance. Furthermore, for conventional package and split air conditioning systems, Hawai'i Energy will require that equipment meet, at a minimum, the Consortium for Energy Efficiency (CEE) requirements, which are more stringent than 2015 IECC, thus continuing to push the industry to exceed the latest energy code even prior to adoption.

For new construction building projects, there are also opportunities to engage developers and the design community to encourage innovation and exceed minimum code requirements. Along with exceeding the minimum code requirements, the Program will also increase its strategic efforts in advocating for minimum product standards for electric appliances brought to the State. This is an extremely cost-effective, far-reaching approach to influencing the market toward energy efficient equipment, and with minimum cost impact to the consumer. California has instituted unique efficiency requirements for specific appliances and the Program will look to partner with other agencies to understand the market dynamics of appliances shipped to Hawai'i, their shelf life, and the impact California's appliance standards may have on Hawai'i in the absence of Hawai'i standards.

 Investigate leading-edge technologies & strategies for integration with building code. In PY18, Hawai'i Energy will continue to chair the SBCC Investigative Committee on Energy Efficiency Code Coordination. This committee addresses leading-edge energy concepts, providing insight and support to the SBCC regarding the latest energy practices, as technology advances and further integrates with our habitable spaces. Conversation topics have included appliance standards, demand response in building codes, and mandatory benchmarking.

5.6 Clean Energy Collaboration

In PY18, Hawai'i Energy will continue to collaborate with multiple external stakeholders including the utility company on demand-side management goals, private and nonprofit entities on innovative and emerging technologies, and public and private resources to leverage ratepayer funding for increased support in

program initiatives. This is an area that is growing in importance as noted in recent Technical Advisory Group and energy efficiency charrette meetings. Our scope is limited to following based on current budget levels:

Integrated Demand-Side Management

Hawai'i Energy will continue with partnership opportunities with the Hawaiian Electric Companies to work towards integrated demand-side management (IDSM) goals. The objective of this framework is to help increase the effectiveness of both parties' Demand Side Management (DSM) efforts, resulting in the most efficient use of customer monies through shared learnings and alignment on common endeavors and identification of new collaborative efforts to integrate renewable energy on the electrical grid and meet the State's 100% clean energy targets.

In PY18, we will build on our collaboration efforts with Hawaiian Electric's Demand Response team to dive deeper into load profiling for residential end use technologies. Together, we will be co-funding a grid interactive water heating (GIWH) project with Shifted Energy that will provide detailed water heating data and provide IDSM benefits to the hard-to-reach renter population. Given that solar water heating is tough to pursue in multi-family properties, this demonstration project will allow us to better understand water usage and duration of time for showers, temperature of water during showers, tank capacity for retaining heat, and the predictive load curve of existing water heaters.

Beyond the valuable data collection, this project will serve hard-to-reach ratepayers, like renters in multifamily dwellings, who have few choices to participate in grid services. We anticipate these efforts will help enhance our framework for direct renter engagement as installations are not permanent and do not impact water heater access or service level to the renter. Also, with time of use rates on the horizon, enabling utilities to help renters shift a large part of their load could bring ongoing economic relief to key ratepayers.

Innovation and Emerging Technologies

Developing innovative projects and incorporating emerging technologies will be pursued with public and private entities to assess the potential for market adoption and to design future program initiatives. In addition, to transform the way residents think about the energy efficiency and clean energy, Hawai'i Energy will continue to explore collaborations with likeminded affiliates to develop projects for monitoring customer end-use consumption and new ways analyze and visualize pathways towards our ambitious clean energy goals.

• Locational Net Benefit Analysis

As discussed in section 2.0, in PY18 Hawai'i Energy will continue its data visualization work to expand our ability to quantify the value to the grid of individual energy efficiency measures for the purpose of supporting energy efficient incentives and refined targeting of energy efficiency programs. We anticipate this tool will allow market participants to analyze the costs and benefits of existing and forecasted technology adoption in relationship to utility infrastructure, the savings for potential Hawai'i Energy participants, demonstrate the benefits to ratepayers and model scenarios using open data and transparent analysis.

6.0 RESIDENTIAL PROGRAM STRATEGY & DETAILS

In PY18, Hawai'i Energy will build upon a successful PY17 campaign which was characterized by achieving ambitious energy saving and customer equity goals, as well as introducing innovative new programs to the residential portfolio. As the culminating year in Hawai'i Energy's three-year portfolio, PY18 will bring together lessons learned, and leverage its relationships with the Clean Energy Ally (CEA) network to offer more energy saving options to a wider base of customers. Hawai'i Energy's PY18 residential portfolio will maintain progress in achieving program cycle goals by building on past program successes, introducing new offerings, leveraging the CEA network, and delivering more savings to the hard-to-reach sector.

Evolution of existing programs and offerings

As the energy efficient technologies like LED lighting are rapidly evolving, so too must the programs that bring these products to families. While the staples of Hawai'i Energy's residential portfolio, LED lighting, Home Energy Reports, Appliances, Solar Water Heating, and HVAC measures, remain an integral part of the plan for PY18, we have made some significant changes to how they are valued within the program. This year, Hawai'i Energy will incorporate lessons learned from these core offerings to ensure the program is able to maximize its influence in the marketplace through the judicious use of consumer education and incentives.

In conjunction with the evaluation effort for the PY16 program year, Hawai'i Energy worked closely with the Energy Efficiency Manager (EEM) and evaluators to refine the assumptions used to calculate savings for two of the most impactful residential offerings. The Residential Upstream LED offering as well as the Peer Group Comparison Home Energy Report (HER) program were investigated to ensure that attributed savings reflected an updated accounting of program impacts.

The outcome of this work was a tiered reduction in the program attribution (Net-To-Gross ratio) for Upstream Lighting, and a reduction in the deemed savings value for the HER program for PY18. The PY18 plan reflects a drop in residential lighting net-to-gross ratio to an average of .575, down from .79 in PY17. The Peer Group Comparison program deemed savings was reduced by 10 percent, to .8, down from .89 in PY17. The evaluation and updating of savings values and program strategies will remain an ongoing effort and continue throughout the next three-year cycle as well.

Furthermore, evaluators will use PY18 data to conduct a thorough evaluation of the HER program for use in future program years. Specifically, Hawai'i Energy will continue to work hand-in-hand with evaluators to conduct a "selective reduction of users from treatment" in PY18, so that the short- and long-term impacts of the reports can be more rigorously evaluated. As a result, we have planned for a reduction of over 20,000 participants in the PY18 HER program.

These outcomes will affect the implementation of the Residential Program in PY18 in several ways. In addition to the PY18 selective stoppage of treatment and evaluation effort within the HER program, Hawai'i Energy will work with the EEM and evaluators to ensure that the program's full impact, including Hawai'i Energy brand awareness, are recognized in future evaluation efforts.

With regard to Upstream Lighting, the program will adjust its implementation strategy as follows:

• The Program will adjust incentives to reflect their reduced attributed impact, while continuing to track the local LED market to ensure its incentives are well-targeted.
- The Program will assess the opportunity to incentivize the highest-performing ENERGY STAR LEDs through tiered incentives, reflecting the program's focus on grid-friendly, energy efficient lighting fixtures
- The Program will increase targeting efforts on hard-to-reach customers and retailers, as attribution assumptions were not reduced for these markets, reflecting the higher incremental cost of LEDs and lower shelf stocking in stores serving those customers.
- Finally, the Hawai'i Energy will continue to explore new technologies and other customized offerings across its portfolio, in its ongoing effort to increase opportunities for program participation.

By soliciting customer and contractor feedback over the years, Hawai'i Energy has learned a great deal about how to maximize program influence, and remove barriers that prevent residents from investing in energy efficiency. For example, the program has revamped its Home Energy Report program, honed its incentive levels in an effort to maximize participation while minimizing free-ridership,--and established well-oiled processes with its contractor base to reduce barriers to program participation.

Build upon the groundwork laid in PY16 and PY17 in the introduction of new offerings

Over the past two years, Hawai'i Energy has developed relationships that continue to bear fruit as we formulate new program offerings in PY18. For example, the program has worked with new home builders and developers to roll out a New Construction offering encouraging residential home construction practices and efficiency strategies that exceed minimum building energy code requirements. To date, almost forty new homes under a local developer have incorporated high efficient lighting and appliance measures in the residences.

Furthermore, the Program has worked with various local and nationwide partners to introduce emerging technologies to the Hawai'i market. For example, the Program will continue to offer a state-of-the-art Home Energy Monitoring system that allows Hawai'i residents to better understand, manage and reduce their energy use. This started as part of a pilot program in PY17 and will continue into PY18. Connected home devices like Home Energy Monitors provide valuable end use data profiles that can be used for future program design as well. See section 2.0 for additional details.

Leverage the CEA network as force multipliers in delivering energy efficiency to Hawai'i residents

Having developed relationships and honed processes with the Clean Energy Ally core of contractors, the program will leverage these relationships to bring new programs to more residents. In PY18, Hawai'i Energy will roll out its Whole Home Retrofit program, which will take a holistic approach to residential energy efficiency by incorporating home audits with a comprehensive menu of incentives tailored to each customer's needs. Hawai'i Energy's network of CEAs will leverage an existing customer base to bring these program offerings to the marketplace, ultimately diversifying Hawai'i Energy's portfolio while generating new business leads.

Deliver more energy efficiency to the Hawai'i residents that need it most, and who are least likely to participate

Hawai'i Energy remains dedicated to serving the energy needs of residents, regardless of income level, homeowner status, or ability to invest in energy saving products. One of the goals of the Energy Efficiency Portfolio Standard was to ensure that all cost-effective energy efficiency measures are acquired. At the same time, it is recognized across the country that there are segments of the population, both residential and commercial, that are less inclined to install energy efficiency upgrades or participate in incentive

programs. This means Hawai'i Energy program must identify the segments are "hard-to-reach" as well as determine ways to improve participation from these underserved groups.

Below is a list of what the Hawai'i Energy views as hard-to-reach for the residential sector. You will find the definition, barriers, and program offerings of hard-to-reach for the business sector in section 7.0.

- Income constraints
 - o Low Income
 - Asset Limited, Income Constrained, Employed (ALICE) defined in section 2.1
- Multi-family tenants/renters
 - o Subsidized housing complexes/communities
 - Age-restricted (senior) residential housing
 - Assisted living facilities
 - o Landlord/tenant issues
 - o Access to decision maker
 - HUD affordable housing rentals
- Transitional housing
- Underserved (may also be present within income constraints and resident type outlined above)
 - Cultural and ethnic populations
 - o Elderly
 - Medical conditions/special needs
 - Rural communities
 - Maui County, Hawai'i County, and rural areas of O'ahu
- Specific end-uses

Hawai'i Energy's hard-to-reach programs address the needs of underserved customer segments that require additional resources or lack the awareness and ability to participate in other traditional incentive offerings. Instead of the customer asking for assistance, Hawai'i Energy seeks out the customer to provide direct access to energy efficiency solutions – *we meet you where you are.* Hawai'i Energy recognizes the importance of making energy efficiency resources and measures as widely available as possible, and this proactive approach mitigates the impediments to participation and provides immediate energy and financial relief to the customer, especially those who are struggling to afford a basic household budget. Components for success include the following:

- Be willing to adjust your approach and listen to the needs of each community;
- Create opportunities to engage community participation;
- Engage local organizations to help deliver the message;
- Choose the right measures and installation strategy; and
- Always ensure extra efforts are taken to support the needs of everyone in the community.

This is the foundation of community based energy efficiency. Hawai'i Energy is expanding its work in this area as there is value in highlighting several programs for a community and presenting them within a holistic framework that allows customers to self-select into the most appropriate offering for their needs.

The Hawai'i Energy hard-to-reach programs are designed to address some of the key barriers to participation by providing the following:

- A simplified offering through direct installation of energy and water saving measures for multifamily residents;
- Continued expansion of partnerships with groups or agencies that serve the hard-to-reach markets identified above;
- Increased focus on rural areas, particularly Maui and the Big Island for PY18;
- Targeted marketing by the program and direct-install contractors.

In particular, multifamily housing has been one of the key focuses of the program given the amount of building stock in Hawai'i that is multi-family housing given our high cost of living and real estate. As noted above, multifamily housing often incorporates many of the other residential hard-to-reach demographics such as income levels, elderly, cultural, as well as medical issues. Maintaining the existence of housing units as affordable is an important goal of all of the Counties, and improving the energy efficiency of affordable housing directly furthers these policy goals by reducing energy waste, reducing operating expenses, and improving the condition of the housing. For this reason the City and County of Honolulu has worked closely with Hawai'i Energy on their inventory of multi-family residences.

Since its inception in PY14, the multifamily direct install (MFDI) program has been a significant component in Hawai'i Energy's hard-to-reach efforts, retrofitting tenant residences with efficient lighting, water, and energy management measures. Branded as "Energy Smart 4 Homes", a high penetration of installations have occurred on O'ahu targeting the State of Hawai'i's affordable housing inventory, which includes larger rental housing projects owned by private, nonprofit, or governmental entities. Out of the approximately 44,000 apartment units (14% of the total household stock) in the City and County of Honolulu¹⁷, the program has currently serviced over 16,000 dwelling units.

In PY18, as the stock of larger multifamily properties on O'ahu decreases, installations in O'ahu will be adjusted to target smaller, single-owner properties. Hawai'i Energy will employ various tactics aimed to influence participation from property managers, tenants, and building owners which will incorporate proven direct-mailing campaigns and other sales approaches that have been effective in the past.

As the market in O'ahu nears saturation, the Program will deploy more resources and will intensify its efforts in Maui and Hawai'i counties where the market potential for MFDI penetration remains high. Public and private multifamily properties will be serviced in hard-to-reach communities as well continuing efforts to retrofit Department of Hawaiian Home Land (DHHL) single-family homes. Although not defined as "multifamily," delivering the program to DHHL single-family homes will support the needs of an underserved native Hawaiian population and will assist with a DHHL General Plan objective to "devote a significant share of time and resources to serve applicants with income below 80% of the median family income level." The potential success of a single-family program may provide openings to other communities in need to ensure customer equity in other hard-to-reach areas.

Furthermore, Hawai'i Energy will build upon its partnerships established in PY17 to deliver high-efficiency lighting, water measures, appliances, water heating, and HVAC to residents who would be otherwise unable to realize these energy savings. Through its relationships with organizations like Council for Native Hawaiian advancement, Sustainable Moloka'i and Pono Home, the program has expanded its reach and ensured that

¹⁷ xxHawaii Housing Finance and Development Corporation. *Hawai'i Housing Planning Study.* Table I-1, Unit Descriptions, County and Districts of Honolulu, 2016.

all residents can benefit from efficiency programs. In PY18, the program will build on these relationships, by expanding its community-based approach, incorporating direct installation programs with its wellestablished transformational and educational programs, providing customers with a comprehensive path to using less energy, and saving money. For more information on community workshops and education see section 5.0.

Coordination with Hawai'i Green Infrastructure Authority (HGIA)

Another continuing key stakeholder in our collaboration efforts includes the Hawaii Green Infrastructure Authority (HGIA). With the recent approval of the Green Energy Money \$aver (GEM\$) On Bill Program, we will work with HGIA on many fronts to ensure success. This includes:

- Coordination with our Clean Energy Allies (CEAs) contractors to educate them on the GEM\$
 financing structure as an enhancement to their finance offers for customers. HGIA will be invited to
 present the GEM\$ program at all of our upcoming annual CEA meetings focused on solar water
 heating contractors in May and June 2018, and will look for other opportunities that make sense on
 an ongoing basis.
- Outreach to the various entities Hawai'i Energy currently works with in hard-to-reach communities to inform them of this financing option and ability to leverage the efforts of both GEM\$ and the Hawaii Energy rebates and educational efforts for their customers.
- As requested by HGIA, provide information and education to customers they are targeting for program participation.

All of the GEMS solar hot water installations are required to meet Hawai'i Energy rebate specifications and to fill out a program application to qualify for rebates. As ordered by the Commission, Hawai'i Energy will specifically track savings for such GEMS financed installations as part of its normal tracking since the savings go through a third party EM&V process. This will eliminate the potential of double counting the impacts towards the measurement of EEPS.

6.1 Residential Program Details

Hawai'i Energy has seen marked success in the last two years of implementation. In year three, the Program will reach more customers with new initiatives, saving residents money, and keeping Hawai'i on the fast track to the State's 2045 100% renewable energy goal. The below table summarizes the residential program offerings for PY18, organized by budget source. See Appendix B for a complete description of each program.

| Residential Programs |
|--|
| REEM |
| Program Communication |
| Behavioral Energy Awareness / Responsibility |
| Upstream |
| High-Efficiency Lighting |
| High Efficiency Appliances |
| Scheduling & Control Systems |
| High-Efficiency Electronics |
| High Efficiency Water Heating |
| Traditional Retail |
| High-Efficiency Appliances |
| High-Efficiency HVAC |
| High Efficiency Water Pumping |
| Scheduling and Control Systems |
| Enorgy Sovings Vits |
| Energy Savings Kits |
| High-Efficiency Water Heating |
| High-Efficiency HVAC |
| High Efficiency Appliances |
| Whole Home Retrofit |
| CREEM |
| Potentially Any and All Channels |
| High Efficiency Custom Measures |
| RESM |
| Trade Ally Provided |
| High Efficiency Water Heating |
| High Efficiency HVAC |
| RHTR |
| Program Direct Install |
| Multifamily Direct Install (Schedule R) |
| High Efficiency Appliances |
| High Efficiency Lighting |
| High Efficiency Water Heating |
| Scheduling & Control Systems |

Figure 5 - List of Residential Programs

6.2 Key Residential Program Updates

A summary listing of the changes to the Residential Program offerings will be discussed in the below tables. For a projection of potential energy savings and cost-effectiveness for proposed changes by budget category, channel and end-use technology (e.g. measure) as well as aggregate targets of the program portfolio, see Appendix F.

| Summary of PY18 Program Updates | | | | |
|--|---|--|--|--|
| Residential Energy Efficiency Measures (REEM) | | | | |
| Home Energy Reports | The Home Energy Report program, previously named the Peer Group Comparison program, will be completely revamped for PY18. | | | |
| | The program will continue to distribute print reports to Hawai'i residents, educating them on their energy use and ways they can save. However, the data analytics behind these reports, as well as the content of the reports themselves will be markedly improved. We are actively engaging with a number of vendors to compare products and pricing as we work to update this offering. | | | |
| | The reports will no longer focus on a comparison with similar homes, but will provide deeper insights into which energy loads are having the greatest impact on each customer's bill. | | | |
| | Using cutting edge analytics, the program is able to disaggregate residents' monthly energy usage, giving customers insight into which household loads are using the most energy. This information will allow customers to target their energy saving efforts, ultimately saving them more energy and money. | | | |
| | Savings attributed to the Home Energy Report program will also be revisited in collaboration with the Evaluation, Measurement & Verification contractor. Specifically, the assumed savings will be reduced from 0.89% of household use to 0.80%. Evaluators will use a "selective reduction in users from treatment" in PY18 to evaluate the residual savings for a given household from prior-years' treatment. For PY18 savings, these 20,000 households will be attributed the standard 0.80% savings rate, reduced by an assumed 80% "decay" rate from their treatment in PY17. This decay rate will then be evaluated for use in future program years. | | | |
| High Efficiency Appliances (Garage Refrigerator/Freezer Bounty) | Consistent with the Program's focus on reaching all demographics of customers, this offering will be getting additional resources in PY18. Because this program does not require a financial investment, and is not limited to homeowners, Hawai'i Energy will renew this offering with a greater incentive, and increased marketing efforts. | | | |
| | As one of the few measures in the portfolio that does not require a customer purchase, the Bounty program (also known as the "Rid-a-Fridge" program) is a crucial part of | | | |

| | · |
|---|--|
| | Hawai'i Energy's portfolio. It encourages homeowners and renters alike to shed themselves of their second refrigerator or freezer, saving them hundreds of dollars per year on their electric bill. |
| Whole Home Retrofit | The Program will roll out its Whole Home Retrofit program, which will take a holistic approach to residential energy efficiency by incorporating home audits with a comprehensive menu of measures, depending on a customer's needs. These may include, but are not limited to lighting, water measures, and home envelope measures. |
| | Hawai'i Energy's network of CEAs will leverage an existing customer base to bring these program offerings to the marketplace, ultimately diversifying the incentive portfolio while generating new business leads for contractors. |
| Customized Residential Energy Efficiency Measures (CREE | EM) |
| Energy Efficiency Innovation | Hawai'i Energy will continue pilot programs for innovative new approaches and technologies to drive energy efficiency and save Hawai'i residents energy and money. |
| | These innovative efforts include a cutting edge Home Energy Monitoring technology pilot, as well as an appliance incentive program targeting landlords buying for their rental units. The programs are a continuation of several opportunities for new approaches and technologies identified nationwide in PY17. |
| Residential Hard-to Reach (RHTR) | |
| Direct Install & Bulk Purchase | In PY18, Hawai'i Energy will build upon PY17 expanded bulk purchase and direct installation programs for hard-to-reach sectors, by integrating its direct install programs with its well-established transformational and educational programs. |
| | Through its Community Based Energy Efficiency program, Hawai'i Energy will leverage existing relationships with community-based organizations and other external resources to connect with customers in deeper, more meaningful ways. See section 5.0 for more details. |
| | Using prior successes, like the Moloka'i Hui Up, as a blueprint, a suite of resource acquisition measures from both the residential and commercial portfolio as well as transformational efforts may be offered to the community. Our expanded bulk purchase and direct installation programs for hard-to-reach customer segments will include high-efficiency clothes washers, clothes dryers, and window ACs. |

7.0 BUSINESS PROGRAM STRATEGY & DETAILS

Program Year 2018 for Hawai'i Energy's business operations will continue to align program offerings with marketplace needs as well as provide sector-specific support through streamlined processes. Above all else, our efforts are fueled by our commitment to build trusted relationships with customers, clean energy allies and the broader stakeholder community.

For PY18, incentive levels and measure offerings continue to be adjusted to achieve overall participation and program goals while enhancing cost-effectiveness. For example, working with the HVAC industry the Program realigned minimum participation requirements to new Consortium for Energy Efficiency (CEE) values, ensuring we are motivating high efficiency equipment selection within industry achievable limits. Additionally, as the screw-in LED lighting market continues to grow, the program is decreasing incentive levels and closely managing participation, while not completely exiting the market in order to avoid a shock to suppliers as well as contractors and customers. Evolving energy efficiency strategies, policy, and market dynamics in Hawai'i and throughout the US are prompting updates to internal processes and program participation requirements.

PY16 and 17 have emphasized a trusted Energy Advisor model of program delivery, as we cultivate customer relationships to encourage both deeper energy efficiency efforts and lasting commitments to pursuing clean energy goals. In PY18, our business team will deepen their focus and work as *industry specialists* and *sector champions*. Energy Advisors will expand their participation in national energy efficiency organization committees in order to implement industry best practices for their sectors. They will identify new events targeted at their customer's needs in order to meet them on their terms, acknowledging that saving energy is not the only reason businesses implement energy efficiency projects. Combined with enhanced data segmentation and visualization tools, Energy Advisors will be equipped to help customers, and their decision makers, not only make smart energy choices, but see their results as well.

Key Pipeline Projects

The Program maintains a robust pipeline of large projects leading into PY18. These projects comprise two wastewater channels for UV lighting upgrades at the Sand Island Wastewater Treatment plant, City & County LED street lighting, and an ESCO exterior lighting project. These projects would account for roughly 15M kWh and 2,000 kW in savings. Hawai'i Energy is in close communication with these key customers to manage timing and likelihood of these critical projects. "Pipeline" management via targeted outreach, leads tracking and follow-up remains a key strategy to deliver the PY18 business plan goals on budget.

Data-Driven Customer Engagement

Building on PY17 operational improvements to our project tracking systems, the Program will expand its use of energy consumption and Program participation data for increased customer engagement in PY18. The application of a data warehouse and data-driven tools will enhance the Program's insight, much in the way energy data allows a facility manager to optimize his or her energy performance. Energy usage modeling and data segmentation will not only enable prioritization and targeting of customers but can also provide powerful charts and visuals to engage customers in a deeper dialogue.

Building on enhanced data analytics and benchmarking initiatives pursue in PY16 and PY17, we will use benchmarking data and deeper modeling of building energy use to further capture potential opportunities and energy savings. We will target large customers (Schedule "P" & "J"), along with small commercial meters (Schedule "G") associated with the same premise as a large customer, which is a good representation of campus-type facilities ideal for deeper Program engagement. In addition, the PY18

program will explore an offering for Schedule "J" rate utility customers with high energy use and demand needs, who lack an energy manager focused on optimizing their consumption costs. Schedule "J" is the General Service Demand rate for commercial facilities, applicable to general light and/or power loads which exceed 5,000 kWh per month or exceed 25 kW three times within a twelve month period but are less than 300 kilowatts per month, and supplied through a single meter.

Comprehensive Services and Support for Clean Energy Allies

As noted in section 5.0, Hawai'i Energy continues to expand its comprehensive services for our Clean Energy Allies with a focus on increasing the number of projects submitted. Leveraging our market multipliers helps us lower the total cost of delivering energy efficiency to customers, and engaged, active Allies help strengthen the energy efficiency market with eligible and successful projects. The Program also relies on CEA feedback to help us maintain and improve program offerings. Our engagement efforts will continue to grow in PY18 based on needs communicated by CEAs when surveyed.

Reduction of LED lighting – incentives and target participation

LED prices continue to drop and an increasing number of traditional lamp types and shapes are seeing costcompetitive LED replacements. Accordingly, we expect the market for most varieties of low-wattage fluorescents to continue to decrease in PY18 and for LED lamps to increase in market share.

On the most common product types, the price of the LED lamps combined with our incentive is low enough that the cost barrier is diminishing. For bulbs that are easily self-installed (e.g. screw-in), rather than needing a contractor to install, incentives are being reduced in PY18 but the program will continue to promote uptake of more efficient bulbs. In the PY18 plan omni-directional LED lamp incentives have been reduced 35% while the target number of incentivized lamps has been decreased by 55%. For lamps which typically involve significant retrofit labor, incentives will continue to be a crucial motivator.

7.1 Business Program Details

The table below summarizes the business program offerings for PY18, organized by budget source. See Appendix C for a complete description of each program.

| Business Programs |
|--|
| BEEM |
| Midstream |
| High Efficiency Lighting |
| Trade Ally-Provided |
| High Efficiency Lighting |
| High Efficiency HVAC |
| High Efficiency Motors |
| High Efficiency Water Heating |
| High Efficiency Water Pumping |
| Envelope Improvements |
| Scheduling & Control Systems |
| High Efficiency Equipment & Appliances |
| Refrigeration Improvements |
| Traditional Retail |
| High Efficiency Equipment & Appliances |
| CBEEM |
| Trade Ally-Provided |
| High Efficiency Lighting |
| High Efficiency HVAC |
| High Efficiency Custom Measures |
| BESM |
| Trade Ally-Provided |
| High Efficiency HVAC |
| Energy Study Grant |
| Commissioning/Recommissioning |
| BHTR |
| Trade Ally-Provided |
| Kitchen Equipment |
| Iraditional Retail |
| Commercial Kitchen |
| Program Direct Install |
| G, J or P Scheduled Multitamily Direct Install |
| Small Business Direct Install (SBDIL) |
| Appliance Opportunities |

Figure 6 - List of Business Programs

7.2 Key Business Program Updates

A summary listing of the changes to the Business Program offerings will be discussed in the below tables. For a projection of potential energy savings and cost-effectiveness for proposed changes by budget category, channel and end-use technology (e.g. measure) as well as the aggregate targets of the program portfolio, see Appendix F.

| Summar | y of PY18 Program Updates |
|--|---|
| Business Energy Efficiency Measures (BEEM) | |
| Lighting | Omni-directional LED lamp incentives have been reduced 35% while the target number of incentivized lamps has been decreased by 55%. |
| | LED prices continue to drop and an increasing number of traditional lamp types and shapes are seeing cost-competitive LED replacements. Accordingly, we expect the market for most varieties of low-wattage fluorescents to continue to decrease in PY18 and for LED lamps to increase in market share. |
| | On the most common product types, the price of the LED lamps combined with our incentive is low enough that the cost barrier is diminishing. For bulbs that are easily self-installed (e.g. screw-in), rather than needing a contractor to install, incentives are being reduced in PY18 but the program will continue to promote uptake of more efficient bulbs. For lamps which typically involve significant retrofit labor, incentives will continue to be a crucial motivator. |
| Midstream Programs | Hawai'i Energy will continue to leverage its midstream program by allocating ~63% of its prescriptive lighting budget (e.g. BEEM) to this channel. We will look to improve the transactional efficiency of this channel through system enhancements and solicit interest with distributors (both existing and/or prospective CEAs) that supply other technologies to the marketplace, such as ENERGY STAR® kitchen equipment and HVAC). The midstream lighting program continues to be one of the most cost- effective program offerings and provides processing efficiencies, new market opportunities and an administratively-efficient platform to broaden impact. By design, instant rebate programs are largely freed of traditional throughput constraints and thus are able to scale quickly. In combination with the fast-changing LED market, this presents new project possibilities such as budget-constrained multifamily associations being able to leverage in-house staff to install low-cost LEDs. At the same time, rapid market movements call for anticipating and proactively updating program design to ensure incentives lead to intended outcomes. In PY18, the Program will reduce incentives on Screw-in LED lamps in all BEEM categories, including Midstream. |
| HVAC | Align conventional A/C incentive minimum requirements with national practices. |

| | This change will be effective at the start of the program year and is part of a continued effort to align with national trends and policies in the energy industry, streamlining manufacturer and distributor Program participation. One example is to adopt the tiered requirements for HVAC efficiency developed by the Consortium for Energy Efficiency (CEE) as minimum requirements for incentive eligibility. |
|--|---|
| Customized Business Energy Efficiency Measures | (CBEEM) |
| Notable Commitments for PY18 | Carry-over of a significant commitment to support a military housing complex's energy management system due to project delays in PY17 |
| | • Funding slated for both lighting and non-lighting projects |
| | Incentive claims are forecasted for the initial phases of the Sand Island wastewater treatment facility UV lighting replacement project |
| | Completion of a substantial portion of the City & County of Honolulu's conversion to LED streetlights. |
| | The CBEEM program offers performance-based incentives for verifiable energy savings determined by site-specific project analysis, where those projects are not covered by other incentive offers due to project scope or incentive program criteria. |
| | |
| Business Energy Efficiency Measures (BESM) | |
| Energy Studies and Audits | Re-introduce incentives for Energy Audits and Energy Study Assistance. |
| | These programs are designed to promote energy-saving evaluations of building equipment and operations that consume electricity. Hawai'i Energy provides an incentive for a portion of the existing facility's energy consumption analysis through a two-phase process: Energy Audits is the first phase, which includes the completion of a preliminary energy audit. The second phase process involves conducting a detailed energy study upon approval of the completed Energy Audit. |
| | Pre-approval is required prior to the start of any audit in order to ensure budget availability, review any prior studies at the location, and have a discussion about the goals and context of the energy analysis. The goal is to document findings and develop an action plan to implement recommended measures that reduce electricity usage. Measures that meet criteria for Hawai'i Energy prescriptive or custom programs may be incentivized as well. |
| | The energy consumption analysis will follow the sequence of events below. Phase 1 must be completed prior to the start of Phase 2. |
| | Phase 1: Energy Audit |
| | Perform energy audit, complete the energy audit worksheet (provided by Hawai'i Energy) and return to Hawai'i Energy for review. |

| | If it is determined that further analysis is necessary, an energy study or Phase 2 may be conducted and incentivized. However, if further analysis is not required, an energy study will not be incentivized by Hawai'i Energy. Energy audit incentives will cover up to 50% of the audit cost (up to a maximum \$5,000). Incentives are capped at 3¢ per sq. ft. for lighting and HVAC, with an additional 5¢ per sq. ft. for buildings with specialty and/or process loads. Phase 2: Energy Study |
|-----------------------|--|
| | Upon completion of the energy audit and finding the need for further analysis, an energy study may be commissioned. Hawai'i Energy's energy study report must be completed and follow our reporting format. Energy Study incentives will be paid upon satisfactory completion of the report in accordance with one of the following: Energy Study Assistance: Payment of 50% of the study up to a \$15,000 total incentive. Incentives are capped at 15¢ per sq. ft. Energy Study Project Implementation: If the ratepayer agrees to implement all ECMs with a 2 year or less simple payback, the program will pay 100% of the study up to a \$25,000 total incentived ECMs have been completed must be submitted to Hawai'i Energy Study Report. Hawai'i Energy will conduct a walkthrough to verify the projects were completed. Once the verification has been made, the additional incentive will be processed and delivered. A pre-final energy study report must be provided to Hawai'i Energy for review prior to final submission. The energy study is not intended to be a sales proposal. All information in the report must be about the project facility. Information deemed as marketing will need to be removed |
| Metering & Monitoring | Advanced sub-metering and energy monitoring to help customers gain crucial insight into when, where, and how much energy is being used within their facility. |
| | New in PY18, this incentive is similar to retro-commissioning in that metering and monitoring can be used to determine the effectiveness and efficiency of current building systems for optimal performance. Where building systems are not preforming at their prime, the data from metering and monitoring can be used to fine tune systems and verify energy savings from operational adjustments pertaining to those systems. The Program will leverage the trade ally delivery channel for projects, as well as seek feedback from trade allies on how to optimize this offer to best assist customers looking to enhance their knowledge of their facility's energy usage. |

| Strategic Energy Management (SEM) | Further SEM work with Hawai'i, Honolulu and Maui counties and Kamehameha Schools, including staff training, leadership buy-in, energy consumption analysis, joint marketing promotions and integrating incentive payments with the customers' financial tracking systems. |
|-----------------------------------|---|
| | Grow participation in the continuous Energy Improvement (CEI) initiative to achieve energy savings through sustained organizational change (behavior and work processes) rather than discrete, energy- saving projects |
| | Continue to refine the strategic energy services we provide in the form of SEM and CEI collaborations with key customers. Building on the initial cohort of three customers in PY17, we seek to multiply the program into sector-specific cohorts, such as municipalities, tourism, and education. Each cohort of committed customers will share ideas and build synergy around common challenges, analogous internal processes, and similar organizational traits. |
| | In the SEM area, county energy managers have expressed a need for baseline data to inform a roadmap to energy efficiency within their respective jurisdictions. This roadmap effort is being considered under the umbrella of SEM. |
| | The CEI initiative is one facet of SEM, initiated with executive decision maker buy-in and then carried out by delegated teams who identify opportunities to shift the organization's culture through operational and behavioral energy conservation. The ripple effects of raising an organizations' energy-use mindfulness can be broad and are crucial to identifying deeper, organization-specific energy savings. |
| | While the SEM approach requires more planning and mapping, the CEI approach is lighter and fast-acting, with the Hawai'i Energy team taking on a role similar to a health coach, by setting goals with the customer, providing suggestions on how to achieve desired outcomes, and then holding the customer team accountable for meeting their goals. |
| | See section 5.0 for more information. |
| Program-Influences Savings | Continue developing a tracking and verification process for "claim- only" projects (i.e. savings that are achieved through influence or direct support from Hawai'i Energy staff). |
| | Claim-only projects are those influenced by the Program in design or implementation but are not associated with an incentive. These projects may arise from an opportunity that was unknown to the customer until identified by Hawai'i Energy staff. Examples include: the Program helping to overcome technical barriers; a payback period too short for Program guidelines; savings being increased after an original estimate is determined to be too small; or savings being derived from a project receiving an outside funding source, but which the Program helped to leverage. |

| Business Hard-to-Reach (BHTR) | |
|--|---|
| Non-Profit Program | Initial consult to identify best opportunities for energy savings |
| | Assistance with developing an RFP for services and getting the word out to local contractors |
| | Educational sessions on basic concepts of energy usage for commercial facilities, such as load profile and demand charges, efficiency vs. renewables, and interpretation of billing data |
| | Higher incentives for energy-saving measures |
| | Nonprofit organizations regularly face limited budgets for overhead costs as donors prefer to directly fund mission-focused services. Decision-makers, busy applying for grants, often overlook energy efficiency as a resource option. New in PY18, Hawai'i Energy will select a small cohort of 3-4 nonprofit organizations through an application process and provide assistance with identifying savings opportunities and developing an RFP. Hawai'i Energy will provide higher incentive rates to contractors to encourage them to bid on projects. Organizations will select their contractor(s) of choice and collaborate with them to complete the specified projects. |
| Energy Advantage Program | Incorporate additional measures including smart strips, water |
| (formerly Small Business Direct Install Lighting | conservation devices, etc. |
| | Incorporate common area lighting |
| | Targeting utility rate schedule "G" businesses often includes offices or tenant spaces of multifamily facilities. Expanding offerings through this program offering turn-key efficiency project scoping, installation and incentive application allows us to maximize our face time with typically hard-to-reach customers, providing a holistic suite of efficiency upgrades. Opportunities in some multifamily facilities will overlap nicely with the residential MFDI program, providing a unified residential and commercial offering to a single facility |

7.3 Defining Business Hard-to-Reach

Small to medium size businesses make up a large percentage of any utility's customer base, and the same is true in Hawai'i. According to a recent study by PG&E in 2016, small customers dominated the office, retail, and restaurant sectors. Moreover, the American Council for and Energy-Efficient Economy, states that small-to-medium commercial customers represent 90% of US businesses and consume about 20% of US energy.

Key barriers contributing to the energy efficiency gap in the small business sector include:

- Lack of time and/or expertise to engage in areas not directly related to their core business;
- Split-incentives between tenant and landlord make it difficult to motivate customers to implement energy efficiency projects;

- Multiple levels of decision makers (landlords, property managers, resident managers etc.) delay project progress;
- Projects often have a longer Return on Investment (ROI) due to shorter operating hours; and
- Lack of access to capital Customers lack capital for energy efficiency investments and often prioritize non-energy projects or energy projects with shorter term paybacks over more comprehensive upgrades.

The small business sector is diverse in terms of industry, energy uses, savings opportunities, financial needs, building types, languages spoken, and cultures. These differences have important implications for program design.

Hawai'i Energy's Energy Advantage program targets the following small business customer base:

- Schedule G 47,000+ small commercial rate schedule customers (defined by the Hawaiian Electric Companies)
- Master-metered small businesses less than 5,000 sq. ft.
- Restaurants

The Energy Advantage program is designed to address some of the key barriers to small business participation by providing the following:

- A simplified offering through direct installation of lighting;
- Enhanced rebates from traditional commercial program offering to improve the ROI;
- Development of specific contractor base that understands the target customers and effectively markets to this group;
- Recruitment of contractors that can market to specific cultures in their native language;
- Significant reduction in upfront capital required by the customer as their cost to the contractor is net of the rebate. In some cases, the contractor will spread that upfront capital amount over several months to address this barrier; and
- Ongoing training from Hawai'i Energy to help these contractors communicate the value of energy efficiency to key decision makers in a way that addresses their pain points and priorities.

Given the higher cost to acquire savings in this hard-to-reach market, this direct install program has focused mainly on lighting. Energy efficient lighting measures have wide applicability across all sectors and, with prices continuing to drop, LED lighting delivers highly cost-effective savings. We recognize that providing direct installation of qualified measures makes participation easier for customers. However, this contractor base often does not have the licensing or expertise to install more technically challenging measures such as HVAC or refrigeration. Lastly, the simple, convenient offerings save the small business owner money immediately and warms them up for additional energy efficiency opportunities in the future.

8.0 BUDGET

Below is a summary of the PY18 program budget.

| Activity | Non-Incentive | Incentive | Total |
|---|---------------|------------|------------|
| Residential Programs | | | |
| REEM | 1,010,000 | 6,272,063 | 7,282,063 |
| CREEM | 40,000 | 125,000 | 165,000 |
| RESM | 30,000 | 418,750 | 448,750 |
| RHTR | 190,000 | 773,776 | 963,776 |
| Total Residential Programs | 1,270,000 | 7,589,589 | 8,859,589 |
| Residential Market Evaluation | 79,820 | 0 | 79,820 |
| Residential Outreach | 520,000 | 0 | 520,000 |
| Total Residential Services and Initiatives | 1,869,820 | 7,589,589 | 9,459,409 |
| Business Programs | | | |
| BEEM | 780,000 | 3,437,254 | 4,217,254 |
| CBEEM | 995,000 | 4,658,529 | 5,653,529 |
| BESM | 95,000 | 214,883 | 309,883 |
| BHTR | 440,000 | 2,987,669 | 3,427,669 |
| Total Business Programs | 2,310,000 | 11,298,335 | 13,608,335 |
| Business Market Evaluation | 134,730 | 0 | 134,730 |
| Business Outreach | 360,000 | 0 | 360,000 |
| Total Business Services and Initiatives | 2,804,730 | 11,298,335 | 14,103,065 |
| | | | |
| Total Residential and Business Services and Initiatives | 4,674,550 | 18,887,294 | 23,562,474 |
| Transformational Programs | | | |
| Residential Transformational Programs | 0 | 1,051,373 | 1,051,373 |
| Business Transformational Programs | 0 | 1,098,627 | 1,098,627 |
| Total Transformation Services and Initiatives | 0 | 2,150,000 | 1,750,000 |
| Total Supporting Services | 1.752.708 | 0 | 1.752.708 |
| Total Infrastructure/Facility Fee | 476.404 | 0 | 476.404 |
| Total Tax on Non-Incentive | 325.301 | 0 | 325.301 |
| Performance Amount | 1,001,670 | 0 | 1,001,670 |
| PY18 Additional Non-Incentive Budget* | 250,000 | 0 | 250,000 |
| | | | |
| Total Estimated Contractor Costs | 8,480,633 | 21,037,924 | 29,518,557 |

*For more information on additional budget, please see section 2.2.

9.0 PERFORMANCE GOALS & INCENTIVE TABLE

Milestone amounts for performance indicators with multiple goals (e.g. Small Business Direct Install) will be subdivided equally for award purposes.

| Performance Indicators | Performa | nce Goals | Performance Metrics | | Performance Award | |
|---|---------------|---------------|---------------------------------------|--------------------------|--------------------------|----------------------------------|
| Resource Acquisition | | | | Fraction of Award 70% | Award Milestone 75% | Target Award \$701,168 |
| KEY FOCUS AREAS | Milestone | Target | Metrics | Award Breakout | Milestone Award Breakout | Target Award Breakout |
| Energy Efficiency & Conservation | 75% | 100% | | | | |
| First Year Energy Reduction | 95,672,810 | 127,563,746 | kWh | 15% | \$112,688 | \$150,250 |
| Peak Demand Reduction | 15,908 | 21,211 | kW | 15% | \$112,688 | \$150,250 |
| Total Resource Benefit | \$243,134,457 | \$334,761,873 | \$ | 40% | \$300,501 | \$400,668 |
| | | R | esource Acquisition Performance Award | 70% | \$525,876 | \$701,168 |

| Customer Equity | | | | Fraction of Award 17% | Award Milestone 75% | Target Award \$170,284 |
|--|--------------------|--------------------|--------------------------------|--------------------------|--------------------------|----------------------------------|
| KEY FOCUS AREAS | Milestone | Target | Metrics | Award Breakout | Milestone Award Breakout | Target Award Breakout |
| Economically Disadvantaged | 75% | 100% | | | | |
| Small Business Direct Install (Energy Advantage) | 506 5,625,000 | 675 7,500,000 | Customers served kWh | 7% | \$52,588 | \$70,117 |
| Multifamily Direct Install | 2,769 1,018,387 | 3,692 1,357,849 | Customers served kWh | | | |
| Island Equity | | | | | | |
| County of Hawaii | NA | 13% | Target spend must be met in | | | |
| County of Maui | NA | 13% | Hawaii & Maui Counties | 10% | NA | \$100,167 |
| City & County of Honolulu | NA | 74% | for Milestone and Target Award | | | |

| Market Transformation | | | | Fraction of Award | Award Milestone | S100 167 |
|--|-----------------------|----------------|---|-------------------|--------------------------|-----------------------|
| KEY FOCUS AREAS | Milestone | Target | Metrics | Award Breakout | Milestone Award Breakout | Target Award Breakout |
| Behavior Modification | | 100% | | | | - |
| Community Workshops (Hard to Reach, Energy Literacy) | NA | 2.500 | Number of participant-hours of Training | | | |
| Youth Education Workshops and Presentations | NA | 1.000 | Number of participant-hours of Training | | | |
| Youth Event Sponsorships | NA | 2 | Number of events | 3.9% | NA | \$39,066.50 |
| Enhanced Engagement (Gamification) | NA | 1,000 | Number of participants | | | |
| Transformational Videos | NA | 10 | Number of videos produced | | | |
| Professional Development & Technical Training | | 100% | | | | |
| Clean Energy Ally Support | NA | | | | | |
| Targeted Ally Training Opportunities | NA | | | 3.9% | NA | \$39,066.50 |
| Targeted Participant Training Opportunities | NA | 8,370 | Number of participant-hours of Training | | | |
| Educator Training and Grants. | NA | | | | | |
| Energy Industry Workforce Development | NA | | | | | |
| Energy in Decision Making | | 100% | | 10/ | | ¢10.017 |
| Strategic Energy Management (SEM) | NA | 2 | Cohort participants | 1% | NA | \$10,017 |
| Community Based Energy Efficiency | NA | 1 | Cohort participants | | | |
| Codes and Standards | | 100% | | | | |
| Codes Identification and Adoption | NA | 9 | Advocacy Events | 10/ | NA | ¢10.017 |
| Code-Related Training & Compliance | NA | 70 | Number of participant-hours of training | 1% | NA | \$10,017 |
| Leading Edge Technologies and Strategies | NA | 4/1 | Stakeholder Meetings / Report | | | |
| Standards Enhancement | NA | 3 | Number of Engagements | | | |
| Clean Energy Collaboration | | | | 20/ | NA | ¢2.000 |
| iDSM pilot project | NA | 1 | Number of pilot projects | .276 | NA | \$2,000 |
| Customer Catisfaction | | | | Fraction of Award | Award Milestone | Target Award |
| customer satisfaction | | | | 3% | NA | \$30,050 |
| KEY FOCUS AREA | Milestone | Target | Metrics | Award Breakout | Milestone Award Breakout | Target Award Breakout |
| Customer Satisfaction | | 100% | | 3% | NA | \$30,050 |
| Application Processing Customer Experience | NA | > 8.5 | Overall customer satisfaction score | | | |
| | Market Transfo | rmation and Cu | stomer Satisfaction Performance Award | 30% | NA | \$300,501 |
| TOTAL PERFORMANCE AWARD: | | | | 100% | \$525,876 | \$1,001,669 |
| | | | | | | |

Overview of Performance Indicators – Metrics and Assigned Weighting

As we enter the third year of this three-year contract cycle, Hawai'i Energy remains consistent with PY16 and PY17 in the weighting of its performance award across the Resource Acquisition (70%), Customer Equity (17%), Market Transformation (10%), and Customer Satisfaction (3%) metrics.

Resource Acquisition – 70%

Within Resource Acquisition focus area, first year energy reduction, peak demand reduction and total resource benefit metrics weighting also remains consistent with the previous two years at 15%, 15%, and 40%, respectively. The targets were established based on the goals for the overall three-year term, with adjustments only applied as a result of funding changes and updates to other variables like avoided cost, system loss factor and net-to-gross values.

Customer Equity – 17%

Hawai'i Energy remains committed to ensuring that resources are distributed equitably across geographies and economic classes. Consistent with the two past years, we have maintained performance award allocation for economically disadvantaged and island equity.

Economically Disadvantaged

The targets for Energy Advantage (formerly small business direct install) and multifamily direct install include both unit counts and energy savings. These were developed to ensure a broader base of participation is coupled with substantial energy savings.

- The Energy Advantage targets have increased the number of units serviced to 675 and increased the savings goal to 7.5M kWh. This is based on additional funding and contractor enrollment, a new mobile device app and the rebranding of this program.
- The target for multifamily direct install has decreased to reflect the evolution of the program. As the market in O'ahu nears saturation, the program will deploy more resources and will intensify its efforts in Maui and Hawai'i counties where the market potential for MFDI penetration remains high. The net result in the properties serviced will decrease due to the smaller market sizes of Maui and Hawai'i counties.

Island Equity

• Island equity targets are set based on the proportion of PBF collections from the HECO, HELCO and MECO.

Market Transformation – 10%

Market Transformation programs make up 10% of the overall Performance Award value. This is consistent with the past two years and was originally developed in proportion with the percent of incentive dollars allocated to these programs. Although Hawai'i Energy is investing slightly higher percentage of incentive dollars into Market Transformation this year, we have kept the same performance award allocation for the sake of consistency.

Each year, Hawai'i Energy takes a close look at its individual market transformation programs in order to incorporate lessons learned, market insight and stakeholder feedback. As we improve our transformational program offerings, we strive to evolve our performance metrics in order to more accurately evaluate success. The descriptions below highlight some of the adjustments made between PY17 metrics and the proposed PY18 metrics.

Behavior Change (previously Behavior Modification)

- Performance award percentage reduced by .1% to allocate performance award dollars to Clean Energy Collaboration.
- Focus Area name change: The naming convention for the Behavior Modification focus area has been updated to Behavior Change to reinforce positive behavioral actions.
- Split out youth education from community workshops, were previously combined efforts.
- Youth Event Sponsorships is a new metric to provide resource support and energy education targeted at youth audiences for STEM related events and career fairs.
- New focus area: Enhanced Engagement replaces Gamification Campaigns and Social Media and Mobile Messaging to reflect a more comprehensive engagement effort with customers. Social media and mobile messaging will be directly aligned with marketing initiatives and gamification will be included in enhanced engagement initiatives. Enhanced engagement will be a transformational goal with participant metrics designed to build audiences and create deeper interactions to affect long lasting or permanent change in participants' energy choices.
- Increased number of Transformational Videos to reflect momentum gained in PY17.

Professional Development

• Performance award percentage reduced by .1% to allocate performance award dollars to Clean Energy Collaboration.

Energy In Decision making

- New focus area: Community-based energy efficiency is a focus area intended to assess the energy efficiency needs of a particular hard-to-reach segment. This specific initiative was born out of feedback received at our stakeholder meeting. Many participants recommended targeted support for community and student leaders, with a listen first approach, allowing them to identify where they would like to see Hawai'i Energy program support.
- Increased number of SEM cohort participants to reflect momentum gained in PY17.

Codes and Standards

While the award allocation remains consistent at 1%, we have updated the metrics to take into account the progress made during PY17. The codes & standards team will be active in advocating for counties to adopt the 2015 IECC, assist in complying with the 2015 IECC, work to enhance energy standards, and provide a forum for dialogue around leading-edge strategies through the energy code process.

Clean Energy Collaboration

In PY18, we set the target for one iDSM pilot project and allocated .2% of the performance award to the clean energy collaboration programs in order to align with the priority for ongoing collaboration with the Utilities DR efforts through integrated demand side management initiatives.

Customer Satisfaction – 3%

Customer satisfaction is measured through online surveys that evaluate the customer application experience.

10.0 CONCLUSION

We are excited to launch the 9th program year of the Hawai'i Energy program and the final year of this three-year program cycle. The Leidos team will continue to build upon its past success to increase program awareness and participation. We will continue to educate island families and businesses about the many lasting benefits of energy efficiency and clean energy. We will encourage and reward practical, everyday energy-savings decisions. In doing so, we can save businesses and families save money, grow our economy, and reduce the demand for electricity and foreign imports.

As noted throughout this Annual Plan, energy efficiency remains the most cost-effective resource to achieve 100% clean energy. Energy efficiency is accessible to all, whether you own your home or rent, whether you live in a cloudy or sunny area of the island, or whether you are a small business or a large corporation. Participants in the Hawai'i Energy programs have the ability to immediately improve their financial standing through reduced energy costs. The savings that customers realize occur at any time of the day in which they use energy, even if it may not be the most beneficial to the grid. Balancing customer needs with grid needs will continue to be a focus in PY 18 and beyond.

The Hawai'i Energy programs have achieved record levels of savings in this current three-year program cycle, in spite of reduced funding. This is not sustainable over the long term. As the program reduces lighting measure volume in the portfolio, deeper savings will come at a higher cost. Increasing focus on transformational efforts and the hard to reach markets also come with a higher cost to deliver. Increasing investment in energy efficiency will be necessary for customers to prioritize energy efficiency investments above solar and storage. The Hawai'i Energy team will continue to develop and implement the most cost-effective solutions to achieve program metrics, but PY16 – PY18 levels of kWh and kW savings cannot be accomplished over the long-term without an increase in investment.

As we prepare to launch Program Year 2018, we intend to continue to build relationships with community partners, energy stakeholders, and the families and businesses of Hawai'i to ensure we are doing all we can to deliver best in class program offerings to help save money, save energy, and pursue a 100% clean energy future. Mahalo for your continued interest and support of the Hawai'i Energy programs!

Aloha,

The Leidos Hawai'i Energy Team

11.0 APPENDIX

APPENDIX A PY18 Program-Level Budget (Expanded)

| Residential Programs | |
|---|------------|
| Residential Program Ops and Management | |
| REEM | 1,010,000 |
| CREEM | 40,000 |
| RESM | 30,000 |
| RHTR | 190,000 |
| Subtotal Residential Programs | 1,270,000 |
| Residential Market Evaluation | 79,820 |
| Residential Outreach | 520,000 |
| Total Residential Non-Incentive | 1,869,820 |
| Residential Incentives | |
| REEM | 6,272,063 |
| CREEM | 125,000 |
| RESM | 418,750 |
| RHTR | 773,776 |
| Subtotal Residential Incentives | 7,589,589 |
| Residential Transformational | 1,051,373 |
| Total Residential Incentives | 8,640,962 |
| Total Residential Programs | 10,510,782 |
| Business Programs | |
| Business Programs Ops and Management | |
| BEEM | 780,000 |
| CBEEM | 995,000 |
| BESM | 95,000 |
| BHTR | 440,000 |
| Subtotal Business Programs | 2,310,000 |
| Business Evaluation | 134,730 |
| Business Outreach | 360,000 |
| Total Business Non-Incentive | 2,804,730 |
| Business Incentives | |
| BEEM | 3,437,254 |
| CBEEM | 4,658,529 |
| BESM | 214,883 |
| BHTR | 2,987,669 |
| Subtotal Business Incentive | 11,298,335 |
| Business Transformational | 1,098,627 |
| Total Business Incentives | 12,396,962 |
| Total Business Programs | 15,201,692 |
| Supporting Services | 1,752,708 |
| | |
| Infrastructure/Facility Fee | 476,404 |
| | |
| Subtotal Non-Incentive (Prior to Tax) | 6,903,662 |
| Total Tax on Non-Incentive | 325,301 |
| Performance Amount (Inclusive of Tax) | 1,001,670 |
| | |
| Subtotal Non-Incentive Billed | 8,230,633 |
| Subtotal Residential and Business Customer Incentives | 18,887,924 |
| Subtotal Transformational Incentives | 2,150,000 |
| Subtotal Customer and Transformational Incentives | 21,037,924 |
| PY18 Additional Non-Incentive Budget | 250,000 |
| Total Estimated Contractor Costs | 29,518,557 |

APPENDIX B Residential Program Offerings

Consistent with PY17, the residential portfolio is organized by budget source, delivery channel, and measure type, allowing for the alignment of planning efforts across marketing, operations, and finance. Below is a brief description of each budget source, followed by a summary table describing the residential offerings for PY18 by measure type.

• Residential Energy Efficiency Measures (REEM)

This budget category contains the core of Hawai'i Energy's residential portfolio and undergoes incremental developments responding to market conditions (i.e. retail pricing) and consumer need. Customer channels include upstream incentives, direct consumer purchases (retail and online), trade ally installed measures and program communicated education/behavioral change efforts.

• Custom Residential Energy Efficiency Measures (CREEM)

This budget category provides a measure of flexibility within the prescriptive portfolio to accommodate unforeseen market opportunities. For PY18, Hawai'i Energy will allocate this budget to the continuation of emerging energy efficiency technology and innovation programs initiated in PY17, and a customized Residential New Construction offering.

• Residential Energy Services & Maintenance (RESM)

This budget category includes ally-driven service offerings to enhance energy savings persistence and bootstrap fledgling energy services businesses trying to secure a toehold in Hawaii.

• Residential Hard-to-Reach (RHTR)

This budget category includes various projects among geographies and demographics that have been traditionally underserved. Efforts in PY18 will continue to address historical participation barriers through direct installation programs.

| Behavioral Energy Awareness / Responsibility | | | | |
|--|--|--|--|--|
| Delivery Channel: Program Communication | Program Description | | | |
| Budget Source: REEM | Description : The Home Energy Report program is a continuation of a behavior-based program launched in | | | |
| Measures | 2011, distributing quarterly printed reports to eligible customers. The reports compare their energy usage to | | | |
| Home Energy Report | that of similar nearby households. The objective of the HER program is to provide relevant energy efficiency education and awareness to residential customers to encourage them to undertake energy-saving measures and behaviors. In addition, the HER program is a gateway program for residential customers to access other Hawai'i Energy offerings. | | | |
| | In PY18, Hawai'i Energy will completely revamp these reports with improved analytics, more reliable content, and an emphasis on positive feedback, consistent with industry best practices. These new reports will generate greater energy savings by giving residents a deeper understanding of their energy use, patterns, and where they might improve. | | | |
| | Delivery strategy : Printed reports are distributed quarterly to eligible customers. Eligibility is determined by the household's energy profile, and the ability to make a reliable comparison to its peer households. | | | |
| | Participation & Incentive Levels: Participation and unit incentives are detailed in Appendix F. | | | |

High Efficiency Lighting

Program Description

- Delivery Channel: Upstream
- Budget Source: REEM

Measures

• Home Energy Report

Description: Lighting rebates are offered upstream through manufacturer direct incentives which are provided as point of sale cost reductions. The objective of the High Efficiency Lighting program is to increase market demand for high efficiency LED lighting options by lowering product prices and increasing efficient product availability.

Hawai'i Energy's lighting program has seen continued success since 2009, and these upstream rebates are critical in ensuring that Hawai'i residents choose ENERGY STAR® LEDs, rather than inefficient halogen bulbs or low quality LED products that remain prevalent on retailer shelves. In addition, point of sale delivery offers a cost-effective implementation strategy for promoting high-volume, efficient product options and opens the door for prime placement of quality products on retail shelves and end caps.

Delivery strategy:

- Distributors, retailers and manufacturers complete a program application in which they commit to advertising and promotion for instant rebates for the LEDs sold to customers.
- Participating retailers agree to display signage showing the rebate has been provided by the program, provide assistance in ordering and stocking qualifying products, and provide sales staff training.
- Retailers agree to promote consumer education, undergo staff training and follow proper procedures.
- Manufacturers provide accurate, timely data on point of purchase information by store by SKU for rebate reimbursement.
- Rebates are administered to manufacturers and expected to reduce the retail price of the lighting.

Implementation with Clean Energy Allies

The program is implemented through strong working relationships between the program, the major LED manufacturers and retailers. The participating LED manufacturers include: Cree, Feit, Philips, General Electric, Acuity, Leedarson, Greenlite, Green Creative, Sylvania, Dangoo, Westinghouse, TCP, and Lighting Science Group. Participating retailers include: Costco, Sam's Club, City Mill, Home Depot, Lowes, Ace Hardware, Safeway, Hardware Hawai'i, Read Lighting, Lighting Concepts & Design, The Light Bulb Source, and Batteries Plus Bulbs.

Scheduling & Control Systems

- Delivery Channel: Upstream/Traditional Retail (Downstream Application)
- Budget Source: REEM

Measures

- Smart Strips
 - Tier I (master device) Advanced Power Strips
- Occupancy Controls, Sensors & Timers
 - Room Occupancy Sensors & Timers
- Smart Thermostats

Program Description

Description: Incentives are offered to retailers and distributors to reduce the purchase price of energy-saving control devices for end users. The objective of the Scheduling and Control Systems program is to increase awareness and market demand for automated control devices that reduce energy consumption of systems that otherwise require manual control.

Delivery strategy: Hawai'i Energy will incentivize the purchase of these devices by working with retailers and distributors to establish point of sale cost reductions, as well as promotional material to educate consumers on the devices' energy saving benefits. HVAC Contractors will also be a channel to deliver smart thermostats.

Participation & Incentive Levels: Participation and unit incentives are detailed in Appendix F.

Measure Notes

Smart Strips

These advanced power strips save energy by shutting off the power to accessory electronics (such as entertainment, sound systems and gaming systems) when a master device (such as a television) is turned off.

Room Occupancy Sensors & Timers

These sensors control the use of lighting in areas around the home with infrequent use such as laundry, storage, garage or spare areas. They are not intended for high use areas.

Smart Thermostats

Hawai'i Energy will continue its Smart Thermostat program, introduced in PY17. This technology is characterized by automatic learning and scheduling features, as well as two-way communication. These features save energy by ensuring the most efficient use of air conditioning and present future opportunities for demand savings through demand response programs.

| High Efficiency Electronics | | | | |
|---|--|--|--|--|
| | Program Description | | | |
| Delivery Channel: Upstream Budget Source: REEM | Description : Hawai'i Energy will continue its successfu | | | |
| | program promotes the purchase of high efficiency | | | |
| Measures | Incentive dollars are used to influence product placement | | | |
| ENERGY STAR [®] Televisions | and signage or applied to instant rebates to customers, depending on the retailer's program preference. | | | |
| • ENERGY STAR [®] Sound Bars | Consumer electronics represent 12% of residential electric energy consumption, with televisions being the top contributor to that consumption. ¹⁸ The Consumer Electronics program objectives are to raise awareness of efficient consumer electronics options, and to reduce electronics loads when idle. | | | |
| | Delivery strategy : Since PY16, Hawai'i Energy has partnered with Sears and Best Buy to promote the purchase of these energy efficient consumer electronics, and plans to expand the program to other retailers in PY18. | | | |
| | Participation & Incentive Levels : Participation and unit incentives are detailed in Appendix F. | | | |

¹⁸ Roth, K. B. Urban, V. Shmakova, B. Lim. Residential Consumer Electronics Energy Consumption in 2013. 2014 ACEEE Summer Study on Energy Efficiency in Buildings. Available at https://aceee.org.

High Efficiency Appliances

- Delivery Channel: Traditional Retail (Downstream Application)/ Trade Ally Provided/Upstream
- Budget Source: REEM / BEEM
 Measures
- Refrigerators
 - Garage Refrigerator / Freezer Recycle Only
 - Refrigerator (with Recycling of Old)
 - Pool VFD Controlled Pumps
- Clothes Washers
- Clothes Dryers

Program Description

Description: This program provides prescriptive incentives to residential customers who purchase and install energy efficiency measures that meet or exceed ENERGY STAR[®] standards. The program objective is to increase the market for high efficiency appliances and residential equipment, as well as to reduce use of inefficient refrigerators and freezers in the secondhand or 'backup' markets.

Delivery strategy: The delivery strategy includes

- The customer purchases a qualified high efficiency appliance.
- For Refrigerator with Recycling, the customer may apply online or obtains an application through the Program's website, in hard copy from Hawai'i Energy, or through point of sale retailer displays.
- For Hawai'i Energy's "Rid-A-Fridge" program, Hawai'i Energy coordinates the pick-up of refrigerators and freezers through local recycling companies, distributing incentives to both the customer and the recycler.
- For high efficiency clothes washers and dryers, Hawai'i Energy offers upstream incentives to encourage retailers to stock and sell only the most efficient models on their floors. Moving rebates upstream streamlines the rebate process and helps reduce supply barriers in a market restricted by distributer and retailer stocking decisions.

High Efficiency HVAC

- Delivery Channel: Traditional Retail (Downstream Application / Trade Ally Provided
- Budget Source: REEM / RESM

Measures

- Fans
 - o Solar Attic Fans
 - o Whole House Fans
- Window AC
 - o Window AC with Recycling
- VRF Split System AC
 - o VRF Split System (small)
 - VRF Split System (large)
 - o Residential AC Tune-Up

• Central Air Conditioner

- o Central AC Retrofit
- o Residential AC Tune-Up

Program Description

Description: Hawai'i Energy's Residential High Efficiency HVAC program provides incentives for undertaking a variety of energy saving measures, including the purchase and installation of new high efficiency air conditioners and fans, the recycling of old Window ACs, and the tune-up of existing central and VRF split ACs.

Delivery strategy:

Window AC with Recycling

Hawai'i Energy will continue to work with local retailers, haulers and recyclers to offer rebates on the purchase of high efficiency window ACs when accompanied by the recycling of an old working unit.

Residential AC Tune Up

In PY18, Hawai'i Energy will continue its highly successful Residential AC Tune Up program, first introduced in PY16. This measure includes the completion of a multipoint checklists on both indoor and outdoor units for central and split air conditioners. Hawai'i Energy was able to launch this program successfully by working directly with contractors to ensure program awareness and quality assurance.

Central AC Retrofits

Hawai'i Energy will continue its Central AC retrofit offering in PY18, which will incentivize the retrofit of an old, inefficient central AC unit with a new model of SEER 17 or better. As with other trade-ally provided measures, a portion of Hawai'i Energy's tune up and retrofit rebates will be subject to inspection for the purpose of quality assurance.

Implementation with Clean Energy Allies

In PY18, we will continue to work with Allies who install these efficient products in homes. We will continue to build relationships with manufacturers, distributors and dealers by offering workshop and events to train Allies on Hawaii Energy's offerings and processes while seeking input on how to create additional offerings and refinements to existing programs. We will also use industry working groups as a resource to identify appropriate efficiency standards, such as ACEEE, ASHRAE and ENERGY STAR when qualifying technologies to be incentivized.

Energy Savings Kits

- Delivery Channel: On-Line Retail
- Budget Source: REEM

Measures

- LED
 - o A19
 - \circ Flood
 - o Globe
- Smart Strips
 - Tier I (master device) Advanced
 Power Strips
 - Tier II (occupancy sensor) Advanced Power Strips

• Water Conservation Device

- o Bathroom Faucet Aerator
- o Kitchen Faucet Aerator
- o Low Flow Showerhead

Program Description

Description: In PY18, Hawai'i Energy will continue to offer customers pre-incentivized energy saving measures through its online store, called "Energy Marketplace", in which customers can purchase individual measures depending on their needs. Combined with promotional "kits" offered through temporary campaigns throughout each program year, Hawai'i Energy's online offerings provide customers a quick, easy way to access quality energy efficiency measures at a reduced price.

Delivery strategy: The online store presents an additional delivery mechanism to ensure that Hawai'i Energy's programs reach a diverse set of customers. With many customers favoring online commerce over brick-andmortar stores, Hawai'i Energy's online presence plays an increasingly important role in program awareness, participation and new technology adoption. Other measures, such as smart thermostats, or occupancy sensors may be introduced to the Energy Marketplace in PY18.

High Efficiency Water Heating

- Delivery Channel: Trade Ally Provided/Upstream
- Budget Source: REEM / RESM

Measures

- Heat Pump Water Heater
- Solar Water Heater
 - o Solar Water Heater (SWH)
 - o PV Direct Water Heater
 - Solar Water Heater Interest Buy Down
 - Solar Water Heater Tune-Up

Program Description

Description: The High Efficiency Water Heating program provides incentives to trade allies and end users to facilitate the purchase, installation and use of efficient and emerging heat pump and solar water heating technologies. The program objectives are to increase the availability of high efficiency and emerging water heating technologies in the market, and to raise consumer awareness of efficient and renewable water heating solutions.

Delivery strategy:

Heat Pump Water Heater

Hawai'i Energy will continue to offer rebates on heat pump water heaters in PY18. In PY17, Hawai'i Energy began offering an upstream rebate on Heat Pump Water Heaters, recognizing that Hawai'i residents had limited options available on shelves. In an effort to influence stocking decisions, Hawai'i Energy began incentivizing retailers for each qualifying Heat Pump Water Heater sold. Hawai'i Energy will continue this program, while simultaneously offering rebates to customers for all Heat Pumps not incentivized at the retailer level.

Solar Water Heating

Solar Water Heater (SWH) & PV Direct Water Heater System Installations

The Program provides a rebate for Solar & PV hot water systems installed by qualified participating contractors. Contractors will provide an instant rebate to the customer at the point of sale, and submit an application directly to Hawai'i Energy for reimbursement. A portion of post-installation inspections is conducted to ensure specification compliance.

Solar Water Heater Interest Buy Down

The Program works with participating lending institutions to provide an incentive to buy down the interest charges for loans made on solar hot water systems that are installed by qualified participating contractors. The customer works with a participating contractor to complete the standard installation process.

Solar Water Heater Tune-Up

The Solar Water Heater Tune-Up program provides an incentive to residential customers for the maintenance and tune up of an existing solar water heater by participating contractors. The program aims to demonstrate the benefits of tune-ups, educate customers of potential savings and system longevity. Like the system installations, tune-ups will be subject to random inspections for quality assurance.

High Efficiency Custom Measure(s)

Program Description

- Delivery Channel: Potentially Any and All Channels
- Budget Source: CREEM

Measures

- Residential New Construction
 O TBD
- Emerging Tech. & Innovation • TBD

Description: The CREEM budget allocates incentive money for custom projects and unique offerings for residential customers. In PY18, the program plans to use this budget on a customized Residential New Construction program by incentivizing builders, architects, and/or developers to exceed code compliance and prioritize energy efficient design and whole house energy performance in the construction of new housing. This offering was introduced in PY17, and the groundwork was laid for a full-scale implementation in PY18.

Hawai'i Energy will also partner with national and local stakeholders to bring emerging energy-saving technologies to Hawai'i's shores. In PY17, Hawai'i Energy introduced a third-party Home Energy Monitoring technology as part of a pilot program that will continue into PY18. Hawai'i Energy continuously reviews new technologies as they become available, and evaluates them for energy saving potential and cost-effectiveness.

The objective of the Custom Measure program is to encourage design and implementation of comprehensive energy-saving solutions and/or adoption of innovative technologies in the residential sector.

Delivery strategy: The Custom Measure program is delivered to the market primarily via design and construction program allies.

Direct Install

- Delivery Channel: Program Direct
 Install
- Budget Source: RHTR / BHTR

Measures

• Multifamily Direct Install

- Tier I (master device) Advanced Power Strips
 - Water Conservation Devices
 - Bathroom Faucet Aerator
 - Kitchen Faucet Aerator
 - Low Flow Showerhead (Fixed)
 - Low Flow Showerhead (Handheld)
- o LED

0

- A19
- 5W Candelabra
- G25 Globe
- Project Direct Cost (Installation Cost & Site Visit Fee)

• Direct Install & Bulk Purchase

- Refrigerator (with recycling of old)
- o Clothes Washers
- o Clothes Dryers
- Window AC with Recycling

Program Description

Description: The Direct Install program provides education on energy-saving opportunities, procurement, installation, and access to program incentives to end-users with a turn-key delivery solution administered by Direct Install providers. The objective of the Direct Install program is to increase adoption of energy efficiency measures in hard-to-reach customer segments.

Delivery strategy:

Multifamily Direct Install (MFDI)

This program will continue the turn-key installation of energysaving technologies like high efficiency showerheads, faucet aerators, advanced power strips and high efficiency light bulbs. The target for PY18 is 4,615 households to participate in the offering; this includes multifamily properties with individuallymetered residential accounts and commercial master-metered accounts. The program will continue to work with channel partners in order to maximize its reach. Additionally, the program will also be breaking down the existing market segments to deliver focused strategic marketing campaigns to further acquire new properties. All measures are installed with no customer co-pay required. Hawaii Energy will manage sales efforts to recruit buildings, customer education, scheduling and installation for multifamily properties in hard-to-reach locations.

Direct Install & Bulk Purchase

Refrigerator (w/recycling)

In PY18, Hawai'i Energy will continue to offer refrigerator trade-ins (with the recycling of old units) at an increased incentive level to hard-to-reach customers. The program saw tremendous success in PY17 in bringing ENERGY STAR® refrigerators to Moloka'i through event-based offerings. In PY18, the program will build off this success, establishing supply chains, and expanding its reach by incorporating these offerings with transformational and educational programs.

Clothes Washers & Dryers and Room Air-Conditioners

In addition to refrigerators, Hawai'i Energy will continue to deliver efficient clothes washers, dryers, and air conditioners to hard-toreach customers at a significantly reduced price. Hawai'i Energy will build on its pre-existing stakeholder relationships to deliver energy saving washers, dryers and room air-conditioners to customers who might not otherwise be able to afford or access them.

APPENDIX C Business Program Offerings

Consistent with PY16 and PY17, the business portfolio is organized by budget source, delivery channel, and measure type, allowing for the alignment of planning efforts across marketing, operations, and finance. Below is a brief description of each budget source, followed by a summary table describing the business offerings for PY18 by measure type.

• Business Energy Efficiency Measures (BEEM)

This budget category offers incentives for standard, known energy efficiency technologies in the form of prescriptive incentives in a streamlined application and grant award process.

• Custom Business Energy Efficiency Measures (CBEEM)

This budget category offers incentives for non-standard energy efficiency technologies often needed for commercial and industrial customers who need to invest in energy efficiency opportunities specific to unique projects and designs. Incentive award amounts are determined via calculations performed to quantify specific energy savings related to unique applications. Customized projects by their very nature require trade allies to propose, sell and execute; and, often involve program Energy Advisors and engineering support from the start.

• Business Energy Service and Maintenance (BESM)

This budget category focuses on developing viable projects through collaboration and direct support in the form of expertise and/or equipment (i.e. metering) from both allies and directly from the program. Guided by past years, this budget category is leaner than prior budgets with a greater focus on intentions and expected outcomes.

• Business Hard-to-Reach (BHTR)

This budget category aims to secure various projects among geographies and demographics that have been traditionally underserved such as small businesses and restaurants, as well as lower-income residential multifamily properties on a commercial-rated meter.

High Efficiency Lighting

- Delivery Channel: Trade Ally Provided / Midstream
- Budget Source: BEEM / CBEEM

Measures

• Linear Fluorescent

- T12/T8 to T8 Low Wattage (4 ft. lamps)
- T12 to T8 Standard (2 & 3 ft. lamps)
- Delamping
 - Delamp with Reflector Kit (2, 4 & 8 ft. lamp)
 - o Delamp Only (2, 4 & 8 ft. lamp)
- LED
 - Linear T8 to Linear LED Tube: w/ Integrated Driver - Plug & Play (Type A)
 - Linear T12/T8 to Linear LED Tube: w/ Remote Driver (Type C)
 - Omni-Directional (Screw-In & Pin)
 - Specialty (Screw-In & Pin)
 - o LED HID Replacements
 - o LED Flat Panel Drop-In Replacements
 - LED Refrigerated Case Lighting
 - o LED Exit Signs
- LED Troffer (fixture replacement or retrofit kit)
 - o 1ft x 4ft
 - o 2ft x 2ft
 - o 2ft x 4ft
- Occupancy Controls, Sensors & Timers • Occupancy Light Sensors
- Customized LED
- Customized Non-LED

Description: The High Efficiency Lighting program offers customer rebates and upstream incentives for purchase and installation of energy efficient lamp and fixture options. The program objectives are to increase demand for energy efficient lighting and educate customers on the benefits of energy efficient lighting design.

Program Description

Delivery Strategy: The program is delivered via enrolled distributors who agree to promote energy efficient lighting options, with the intent of offsetting price premiums at the sale counter. Additionally, Clean Energy Allies can pursue rebates on behalf of customers for energy efficient lighting projects via the custom incentive program.

Participation & Incentive Levels: PY18

participation and unit incentives are summarized in Appendix F. Unit incentives reflect a reduction from PY17 in response to falling LED prices.

Measure Notes:

Program enhancements for PY18 will be a lessor reliance on screw-in LED and a greater reliance on purpose built fixtures like integrated 2x2 and 2x4 troffers. The prescriptive incentive for these troffers was initiated in PY17, but garnered a rather slow response. However, recent trends in the commercial lighting marketplace indicate this may be where the market is headed.

The midstream incentive delivery channel has proven to be the most cost-effective way to deliver a lighting incentive program to the local market, and the program makes it easy for customers to participate. By offering the incentive at the point of purchase and without requiring applications, Hawai'i Energy simplifies program participation resulting in more customers benefitting from the program. Further, by concentrating multiple customer transactions into a single data exchange between the distributor and Hawai'i Energy, we leverage the tracking and sales software of our partnering distributors to reduce the cost to process customer transactions.

High Efficiency HVAC

Program Description

- Delivery Channel: Trade Ally Provided/Midstrea m
- Budget Source: BEEM / BESM / CBEEM

Measures

- Chillers: Meets
 IECC 2015 Energy
 Code
- Package AC Units: Based on CEE tiers

• VFD Speed Controlled

- Air Handler Units
- Chilled Water
 / Condenser
 Water

• VRF Air Conditioners

- Existing Facility
- New
 Construction
- Ventilation
 - Garage Active
 Ventilation
 Control
- Custom HVAC
- ECM on Fan Coil Units (see High Efficiency Motors section)

Description: The High Efficiency HVAC program offers customer rebates for purchase and installation of energy efficient air conditioning units, variable frequency drives on air conditioning components, and other HVAC improvements. Program objectives are to offset the higher incremental cost of energy efficient HVAC equipment and to educate customers on the benefits of energy efficient HVAC equipment.

Delivery strategy: The HVAC program is delivered to the market through Program Allies who encourage customer participation and assist with application submittal. Hawaii Energy staff provide program collateral, technical advice and process applications for rebates.

Participation & Incentive Levels: PY18 participation and unit incentives are summarized in Appendix F. Unit incentives will remain the same as in PY17.

Measure Notes

In PY18 Hawai'i Energy will work with HVAC distributors to determine if instant rebates can be offered on all package, split, and VRF AC units that qualify for the standard rebate program. Other HVAC equipment, such as chillers and variable frequency drives (VFDs), are typically more complicated projects that still require incentives to promote, but don't lend themselves well to a midstream program. While broadening participation, midstream programs can better influence distributors to stock higher efficiency units, particularly to serve the replace-on-burnout market as well as upselling new installations.

Chillers: Both air-cooled and water-cooled that have efficiencies meeting the International Energy Conservation Code (IECC) 2015 energy code. Significant savings can be achieved with this measure particularly considering the 20 year life expectancy. Package Units: In previous years, Hawai'i Energy's minimum qualifications for incentives were based on surpassing the IECC 2006 minimum efficiency, on which the county building codes are based, by at least 15%. However, recently the Department of Energy (DOE) increased energy conservation standards for unitary air conditioning and heat pump units beyond IECC 2006, thereby creating a situation where less efficient units could not be manufactured or imported. Hawai'i Energy then increased our minimum efficiencies to 15% greater than the DOE energy conservation standards. This created a situation where some manufacturers did not have air conditioning units that could meet these minimum efficiencies. Therefore in PY18, Hawai'i Energy will adopt a two tier approach to unitary air conditioning and heat pump unit based on the Consortium for Energy Efficiency (CEE) specifications. However, this will result in lesser savings from this measure as the assumptions for base case efficiencies have increased.

Variable Frequency Drives (VFD): The use of variable frequency drives to vary motor speeds to control flow in response to changes in loads provides significant savings in HVAC applications of supply, return and exhaust fans as well as chilled water and condenser water pumps.

Inverter driven variable refrigerant flow (VRF) air conditioning systems utilize variable speed compressors along with most often multiple individual zone evaporators to provide the ability to more closely match the building's cooling requirements. Energy savings from VRF air conditioning are primarily from increased part-load efficiency operation.
| High Eff | iciency Motors |
|--|--|
| | Program Description |
| Delivery Channel: Trade Ally Provided Budget Source: BEEM | Description : The High Efficiency Motors program |
| Maaaumaa | offers customer repates for purchase and installation of energy efficient motors. Program |
| IWIEdSULES | objectives are to offset the higher incremental cost |
| ECM Fan Coil Fans (HVAC) Evaporator Fan Motors (with | customers on the benefits of energy efficient motors. |
| Controller) (Refrigeration) | Delivery strategy : The program is delivered to the end user by Trade Allies encouraging customer participation and assisting with application submittal. |
| | Participation & Incentive Levels : PY18 participation and unit incentives are summarized in Appendix F. Unit incentives will remain the same as in PY17. |
| | Measure Notes: |
| | Electronically Commutated Motors (ECM): ECM motors have higher electrical efficiency (Electronically Commutated Motor, 70 percent efficient) than PSC (Permanent split capacitor, 49 percent efficient) or shaded-pole (32 percent efficient). In addition, "cooler" motor operation creates less heat load on the conditioned space. The two main program applications include HVAC and refrigeration. |

| High Efficien | ncy Water Heating |
|--|---|
| | Program Description |
| Delivery Channel: Trade Ally Provided Budget Source: BEEM | Description : The High Efficiency Water Heating program offers customer rebates for purchase and installation of energy efficient water heating |
| Measures | technologies, and will continue in PY18 to promote |
| Solar Water Heater Heat Rump Water Heater | market uptake of these technologies by reducing first costs. |
| • neat rump water neater | Delivery strategy : The program is delivered to customers by Trade Allies encouraging customer participation and assisting with application submittal. |
| | Participation & Incentive Levels : PY18 participation and unit incentives are summarized in Appendix F. Unit incentives will remain the same as in PY17. |
| | Measure Notes: |
| | Solar Water Heating Commercial solar water heaters provide a renewable energy source of water heating. The systems can reduce electrical consumption for water heating by providing supplemental pre-heating up to 100% of the water heating needs, depending on the hot water demand characteristics and the site's physical constraints on storage tank and panel locations. |
| | Heat Pumps Heat pump water heaters provide a highly-efficient source of water heating. Water-source heat pumps are most efficient when used to supplement the heat rejection from chilled water return loops and condenser water systems to heat a facility's domestic water needs or swimming pools. Heat pumps can also be air-source and provide heat mitigation in areas such as commercial kitchens and can function as a stand-alone water heater for pools. Heat pumps have a coefficient of performance exceeds 3, indicating they are more than 3 times more efficient than electric resistance heating. |

Water Pumping Efficiency

Program Description

- Delivery Channel: Trade Ally Provided
- Budget Source: BEEM/BESM
 Measures

• VFD Speed Controlled

- o Booster Pumps
- Pool Pump
 Packages

• Water System Upgrade Assistance (see related activities in Transformational Program Strategy and Details section)

Description: The High Efficiency Water Pumping program offers customer rebates for purchase and installation of VFDs on domestic water and pool pumps. The program also provides specialized assistance to public and private water and waste water companies.

Delivery strategy: The program is delivered to customers by Trade Allies encouraging customer participation and assisting with application submittal. Hawai'i Energy staff work directly with water and waste water companies to access their needs and assist where possible.

Participation & Incentive Levels: PY18 participation and unit incentives are summarized in Appendix F. Unit incentives will remain the same as in PY17.

Measure Notes:

VFD Speed Controlled Pumps

The replacement of single speed staged domestic water booster pumps can provide up to 70% energy savings by providing constant pressure regardless of flow and reducing pump speed during low use periods, therefore increasing system efficiency.

Pool pumps often run much longer than necessary. A variable speed commercial pool pump motor in place of a standard single speed motor can save energy and maintain a comfortable swimming pool temperature and chemical circulation by using a smaller, higher efficiency pump and by operating it less.

Water System Upgrade Assistance

The energy-water nexus continues to be a focus of programs across the country as well as our efforts here in Hawai'i Energy. The program will be delivered to the water and wastewater industry through communication and outreach to facilities division and their administration/management. We will provide information about the value of energy efficiency, the attributes of the program, and how incentive funding can be provided to motivate implementation of energy saving projects.

Stand-alone educational programs will be provided to educate the industry on the value of energy efficiency and will be integrated with program information. We will raise awareness with CEA's and other industry consultants regarding energy efficiency value, the importance of integrating efficiency into their designs, and the financial benefit an energy-efficient design can bring to the clients they serve. Further, continual contact with regulatory agencies will keep them informed about the program and the value it can bring to the water and wastewater industry. Continual contact with other organizations and programs, such as the Rural Water Association, will continue to promote the program's value to all community sizes. The Hawaii Rural Water Association provides valuable interface with all of the midsize utilities and, importantly, the small systems. See section 5.0 for more information.

| Envelop | e Improvements |
|--|---|
| | Program Description |
| Delivery Channel: Trade Ally Provided Budget Source: BEEM | Description : The Envelope Improvement program offers customer rebates for purchase and installation |
| Measures | promote market uptake of this technology by |
| Window Tinting | reducing first costs. Delivery strategy : The program is delivered to customers by Trade Allies encouraging customer participation and assisting with application submittal. Participation & Incentive Levels : PY18 participation and unit incentives are summarized in Appendix F. |
| | Unit incentives will remain the same as in PY17. Measure Notes: Window tinting can save energy by reducing heat gain |
| | through windows as well as preventing lowering of temperature set points by occupants near the windows. Modern tints can provide the rejection of infrared energy while not blocking visible light. This expands tinting opportunities in view sensitive locations such as hotel and office buildings. |

Scheduling & Control Systems

Program Description

- Delivery Channel: Trade Ally Provided
- Budget Source:
 BEEM

Measures

Occupancy Controls, Sensors & Timers

- Hotel Room
 Occupancy
 Controls
- Vending Machine Occupancy Controls
- Garage Exhaust Ventilation

Description: The Scheduling and Control Systems program offers customer rebates for purchase and installation of occupancy controls in hotel rooms and on vending machine, and carbon monoxide sensor and controls for enclosed parking garages. The program will continue in PY18 to promote market uptake of these technologies by reducing first costs.

Delivery strategy: The Scheduling and Control Systems program is delivered to customers by Trade Allies encouraging customer participation and assisting with application submittal.

Participation & Incentive Levels: PY18 participation and unit incentives are summarized in Appendix F. Unit incentives will remain the same as in PY17.

Measure Notes:

Hawai'i Energy will target the installation of energy management systems that give **thermostat control** to existing guest room air conditioning systems using occupancy sensors.

Controls can also significantly reduce the energy consumption of **vending machine lighting and refrigeration** systems. Qualifying controls power down these systems during periods of inactivity but, in the case of refrigerated machines, must always maintain a cool product that meets customer expectations. This measure applies to refrigerated beverage vending machines, non-refrigerated snack vending machines, and glass front refrigerated coolers. This measure should not be applied to ENERGY STAR[®] qualified vending machines, as they already have built-in controls.

Demand-controlled ventilation (DCV) using carbon monoxide (CO) sensing is a combination of two technologies: Sensors that monitor CO levels in the parking garage, and an air-handling system that uses data from the sensors to regulate the amount of ventilation air admitted. CO sensors continually monitor the air in a parking garage. Given a predictable activity level, automobiles will exhaust CO at a predictable level. Thus CO production in the parking garage will closely track activity. Given these two characteristics, a CO measurement can be used to measure and control the amount of outside air that is being introduced to offset the CO generated by automobiles. The result is that ventilation rates can be measured and controlled to a specific cfm/ft2. This is in contrast to the traditional method of ventilating at a fixed rate regardless of occupancy. Codes for enclosed parking areas require ventilation during all hours of operation to protect against an unhealthy buildup of carbon monoxide (CO). As a result, exhaust fans generally run 100% of operating hours. Although some buildings use timers to cut fan run time, it is important to note that the use of timers may not meet code compliance and health considerations. To achieve major energy savings and meet all health requirements, carbon monoxide sensors have now been authorized by code and mandated in some jurisdictions for new construction. Sensors measure CO levels, activating fans only when necessary to maintain CO at an acceptable level, saving up to 90% of energy cost.

High Efficiency Equipment & Appliances

- Delivery Channel: Trade Ally Provided
- Budget Source: BEEM

Measures

- Refrigerator (with Recycling of Old)
- Garage Refrigerator / Freezer Recycle Only

Description: The High Efficiency Equipment and Appliance program offers customer rebates for purchase, installation and recycling of older inefficient refrigerator and freezers in commercial facilities. The program will continue in PY18 to promote market uptake of these technologies by reducing first costs.

Program Description

Delivery strategy: The High Efficiency Equipment and Appliance program is delivered to customers by Trade Allies encouraging customer participation and assisting with application submittal.

Participation & Incentive Levels: PY18 participation and unit incentives are summarized in Appendix F. Unit incentives will remain the same as in PY17.

Measure Notes:

ENERGY STAR® Refrigerators: There is a 32 to 62% energy reduction opportunity in the replacement of the "old" office refrigerator with a modern ENERGY STAR® model. There is a \$100 incentive for ENERGY STAR® units bought and delivered by participating retailers. This incentive is a 10 to 25% reduction in the cost of a new ENERGY STAR® model.

Distribution Transformer: The incentive for distribution transformers has been discontinued. This is the result of the elimination of the Consortium for Energy Efficiency (CEE) Distribution Transformer Initiative. CEE discontinued the program after a new federal minimum standard was instituted in January 2016. The new DOE standards are closely aligned with the former CEE specification. CEE worked with a group of manufacturers in 2015 to consider a new, higher specification level, but the manufacturers indicated clearly that it would not be cost effective for them to build and sell equipment that significantly exceeded the minimum standard. This prompted CEE to discontinue their initiative.

Refrigeration Improvements

Program Description

- Delivery Channel: Trade Ally Provided
- Budget Source: BEEM

Measures

- Refrigerated Night Covers
- ECM on Evaporator Fan Motors (see High Efficiency Motors sections)

Description: The Refrigeration Improvements program offers customer rebates for purchase and installation night covers for refrigerate display cases and electrically commutated motors on refrigerator evaporators. The program will continue in PY18 to promote market uptake of these technologies by reducing first costs.

Delivery strategy: The Refrigeration Improvements program is delivered to customers by Trade Allies encouraging customer participation and assisting with application submittal.

Participation & Incentive Levels: PY18 participation and unit incentives are summarized in Appendix F. Unit incentives will remain the same as in PY17.

Measure Notes:

Commercial refrigeration equipment includes self-contained and remote-condensing refrigerators, freezers, and commercial refrigerator-freezers. Commercial refrigeration equipment is used for food storage and merchandising purposes in the food retail industry (i.e. grocery stores, supermarkets, convenience stores, specialty food stores) and the foodservice industry (i.e. restaurants and cafeterias). Energy conservation measures that reduce the operational time or intensity of refrigeration equipment while still maintaining a comfortable shopping and work environment can offer substantial savings. Refrigeration is, by far, the largest load in a grocery store. Significant energy savings can be gained not only from refrigeration tune-ups and maintenance, but also through retrofits and cost-effective replacement of older equipment.

There are many market segments that require commercial refrigeration, which includes independent grocers (i.e. Times, Don Quote, KTA) and national chain supermarkets (i.e. Costco, Safeway, Wholefoods), restaurants, mini-markets/gas stations, and smaller convenience stores. This program will be delivered to the commercial market through the refrigeration suppliers. Information about the available incentives will be disseminated first to the refrigeration suppliers and vendors to leverage their reach into the commercial market. Then, we will communication with facility managers, engineers, and their administration/ management to inform them about the value of energy efficiency, the attributes of the program, and how funding can be provided to motivate implementation. Attendance and participation at the various trade shows and conferences will continue to make the industry aware of the program. Stand-alone educational programs will also be provided to educate the industry on energy efficiency value.

High Efficiency TBD (Custom Projects)

Program Description

- Delivery Channel: Trade Ally Provided
- Budget Source: CBEEM

Measures

- Customized Project Measures with > 5 Year Life: TBD - Committed
- Customized Project Measures with <5 Year Life: TBD - Uncommitted

Description: The Customized Projects program offers customer rebates for energy efficiency measures and improvement that are not specifically identified in any of Hawai'i Energy's other programs. This program is designed to provide flexibility in the portfolio to allow for specialized measures that may come up as one-off projects. The program allows the Hawai'i Energy staff, working with the vendor and the customer, to determine the appropriate rebate for each project. The program will continue in PY18 to promote market uptake of these energy efficiency projects by reducing first costs.

Projects that have longer life measures often have longer paybacks, which makes it difficult for businesses to gain approvals for them. These projects can be pushed into reality by offering increases in the incentive levels in order to enhance feasibility and get them to a point where the customers will implement them.

Delivery strategy: The Customized Projects program is delivered to customers by Trade Allies encouraging customer participation and assisting with application submittal, and individualized assistance from the Hawai'i Energy staff.

Participation & Incentive Levels: Since these project span a variety technologies that are generally to-be-determined, a proxy PY18 budget and participation can be found in Appendix F.

Measure Notes:

This program provides for incentives for all energysavings actions that are not already covered by the prescribed incentives. Custom incentives will not be limited to a certain list of measures.

Our custom project program will provide an application and granting process for participants to receive incentives for installing non-standard energy efficiency technologies. The intent of this structure is to enable customers to invest in energy efficiency processes and technology measures that may require calculations of energy savings for specific, unique applications. Incentive awards will be based on calculated savings that ensure program cost-effectiveness.

Behavioral Energy Awareness / Responsibility

- Delivery Channel: Trade Ally Provided
- Budget Source: BEEM / BESM

Measures

- Submetering
 - o **Condominium**
 - o Commercial Property

Program Description

Description: The Behavioral Energy Awareness/Responsibility program offers customer rebates for purchase and installation submetering in master-metered condominium and commercial properties. The program will continue in PY18 to promote market uptake of these technologies by reducing first costs.

Delivery strategy: The Behavioral Energy Awareness/Responsibility program is delivered to customers by Trade Allies encouraging customer participation and assisting with application submittal.

Participation & Incentive Levels: PY18 participation and unit incentives are summarized in Appendix F. Unit incentives will remain the same as in PY17.

Measure Notes:

This program is designed to assist master-metered condominiums and their Association of Apartment Owners (AOAO) to install billing submeters for their units and common areas to drive energy conservation and ensure equity and fairness in allocating energy costs to tenants and/or owners of their condominium units. The knowledge of personal energy usage and the responsibility to pay for it can result in energy usage behavior modification and reward those making investments in energy efficient equipment.

The combination of billing submeters, along with education, peer group comparisons and special equipment offerings, will assist the owner or tenant to achieve significant energy conservation and efficiency.

This also provides the AOAO an opportunity to receive an energy audit of the property and participate in other Hawai'i Energy incentives for conservation in all common areas. Possible additional incentives could include A/C, lighting, pool pumps, domestic water pumps and parking garage exhaust fans.

Commissioning / Retro-Commissioning

Program Description

- Delivery Channel: Trade Ally Provided
- Budget Source:
 BESM

Measures

- System Retrocommissioning
- Metering and Monitoring

Description: The Commissioning and Retro-Commissioning program offers customer rebates for commissioning studies and the installation of sub-metering equipment that bring about savings through equipment optimization. The program will continue in PY18 to promote market uptake of these studies and technologies by reducing first costs.

New in PY18, the metering and monitoring incentive is similar to retrocommissioning in that metering and monitoring can be used to determine the effectiveness and efficiency of current building systems for optimal performance.

Delivery strategy: The Commissioning and Retro-Commissioning program is delivered to customers by Trade Allies encouraging customer participation and assisting with application submittal.

Participation & Incentive Levels: PY18 participation and unit incentives are summarized in Appendix F.

Measure Notes: The **recommissioning/retro-commissioning measure** incentivizes building owners to evaluate and/or periodically re-evaluate the effectiveness and efficiency of current building systems for optimal performance. Savings are achieved by optimizing building systems and assemblies to operate as efficiently as possible based on design criteria, data evaluation, and operational parameters. These savings opportunities will likely be a combination of no/low cost operational adjustments and sequencing, low-cost equipment optimization, and capital improvement projects, such as:

- Implementation of an automated building management system to control lighting and HVAC schedules and set-points.
- An education and training component for building operations personnel on how to operate the building efficiently, focusing particularly on O&M changes implemented during the retro-commissioning project.
- Inspect HVAC duct work for leaks and damage. Include findings in RCx report.
- Identify peak load shaving options that can be implemented during peak periods.
- Reduce customer operating costs during peak and off-peak periods.
- Develop a plan to educate and train the building personnel how to operate the building efficiently.
- Document findings and develop an action plan to implement recommended measures that reduce electricity usage.
- Reduce energy consumption in commercial and industrial facilities by incentivizing energy conservation measures through the customized incentive program.

Advanced sub-metering and energy monitoring can help customers gain crucial insight into when, where, and how much energy is being used within their facility. This information is very valuable when determining areas for energy efficiency improvements. Where building systems are not preforming optimally, data from metering and monitoring can be used to fine tune those systems and verify savings from any operational changes to those systems. Metering and monitoring incentives cannot be combined with the retro-commissioning incentives.

Strategic Energy Management (SEM)

Program Description

- Delivery Channel: Program Direct
- Budget Source: BESM

Measures

• Various, including Energy Studies, Operational Savings, Training, Behavioral Change, and Capital Projects **Description**: The Strategic Energy Management program offers customer specialized assistance in looking at how energy is being use at their facility and how it may be optimized. The program will continue in PY18 to work with individual customer to optimize and save energy at their facilities.

Delivery strategy: The Strategic Energy Management program is delivered to customers by Hawai'i Energy staff working directly with the customer.

Participation & Incentive Levels: PY18 participation and unit incentives are summarized in Appendix F.

SEM is a holistic, longer-term approach to energy savings with a focus on the specific needs of individual customers. It can encompasses a broad array of strategies such as staff training, executive buy-in, energy studies, joint marketing promotions and integrating incentive payments with the customers' financial tracking systems. SEM promises to deliver deeper and more sustained savings.

Continuous Energy Improvement (CEI) is a structured initiative within the SEM program centered on behavioral and work process changes to achieve deeper energy savings – i.e. sustained organizational change akin to continuous quality improvement initiatives. Customers are provided training on identifying savings opportunities in their daily work, technical support on energy usage measurement/modeling, and ongoing coaching until CEI becomes ingrained in the organizations' cultures. Capital projects may result from CEI efforts but are not the main focus.

Heightened awareness and engagement with energy throughout participating organizations will be the driver for identifying deeper savings opportunities as well as creating a multiplier effect for energy-conscious behavior at work and at home. See section 5.0 for more information.

Energy Studies and Audits

- Delivery Channel: Trade Ally Provided
- Budget Source: BESM

Measures

- Energy Audit
- Energy Study Assistance

Description: The Energy Studies and Audits program offers customer rebates for energy studies and audits. Although not new to the Hawai'i Energy portfolio, this program has been on hold over the last two years due to funding constraints. The program will be restarted in PY18 to promote market uptake of these studies and audits by reducing first costs.

Program Description

Delivery strategy: The Energy Studies and Audits program is delivered to customers by Trade Allies encouraging customer participation and assisting with application submittal.

Participation & Incentive Levels: PY18 participation and unit incentives are summarized in Appendix F.

Measure Notes:

Energy Audits

This offer is designed to promote energy-saving evaluations of building equipment and operations that consume electricity. Hawaii Energy provides an incentive for a portion of the existing facility's energy consumption analysis through a two-phase process: Energy Audits is the first phase, which includes the completion of a preliminary energy audit.

Pre-approval is required prior to the start of any audit in order to ensure budget availability, review any prior studies at the location, and have a discussion about the goals and context of the energy analysis.

Document findings and develop an action plan to implement recommended measures that reduce electricity usage. Measures that meet criteria for Hawai'i Energy prescriptive or custom programs may be incentivized as well.

Energy Study Assistance

Hawai'i Energy provides an incentive for a portion of the existing facility's energy consumption analysis through a second phase process: conducting a detailed energy study upon approval of the completed Energy Audit (see above).

Influenced - Non-Incentivized Efforts

- Delivery Channel: Program Direct
- Budget Source: BESM

Measures

• Influenced – Non-Incentivized Efforts

Program Description

Influenced - Non-incentivized efforts

In PY18 we will continue to explore claim-only project savings. This includes energy efficiency savings that are claimed by a Program without the payment of a financial incentive. A claim-only project can arise from a project opportunity that was unknown to the customer until it was identified by an Energy Advisor or a Hawai'i Energy activity, such as an energy team meeting. Claim-only projects are influenced by the Program in design or implementation but are not provided with an incentive for some reason, including (but not limited to): the Program helped overcome technical barriers; payback period was too short for Program guidelines; savings were adjusted upward after the original estimate was determined to be too small; or savings were derived from a project receiving an outside funding source, but which the Program helped to leverage, or the participant received Public Benefit Fee funds in a different way (i.e. 0% loan from GEMS). The fact that a Program implementer or activity identified the opportunity attests that it is Program-induced, even without an incentive. The customer will be asked to provide a signed Impact Statement asserting that the Program influence was the initiating factor.

| | Kitchen Equipment |
|--|---|
| Delivery Channel: Traditional Retail (Downstream Application) / Trade Ally Provided Budget Source: BHTR | Program Description Description: The Kitchen Equipment program offers customer rebates for purchase and installation ENERGY |
| Measures | demand controlled ventilation. The program will continue in |
| Kitchen Exhaust Hood Demand Ventilation Commercial Ice Machine | PY18 to promote market uptake of these technologies by reducing first costs. Delivery strategy: The Kitchen Equipment program is delivered to customers by Trade Allies encouraging |
| Commercial Electric Steam Cooker Commercial Electric Griddle Commercial Fryer Commercial Hot Food Holding | customer participation and assisting with application submittal. |
| Cabinet Commercial Combination Oven Commercial Convection Oven | unit incentives are summarized in Appendix F. Unit incentives will remain the same as in PY17. |
| Commercial Reach-In Refrigerator Commercial Reach-In Freezer | Measure Notes: Kitchen ventilation with demand control hood exhaust uses temperature and/or smoke sensors to adjust ventilation rates. This saves significant energy comparing with the traditional 100% on/off controls. Traditional ventilation systems operate at one speed regardless of how hard the appliances are working. Demand Control Kitchen Ventilation systems respond to variations in stove use, allowing the two-speed or variable speed fans to regulate exhaust and makeup airflow as necessary. Therefore, when stoves are off or only a few burners are in use, the exhaust fans work at lower speeds and use less energy. Bestaurants are extremely energy intensive, using about 5 to7 |
| | times more energy per square foot than other commercial buildings, such as office buildings and retail stores. High- volume, quick service restaurants may even use up to 10 times more energy per square foot than other commercial buildings. Restaurant operators and commercial or institutional kitchens can save energy and money annually and over the equipment lifetime by choosing ENERGY STAR® certified kitchen equipment. To meet ENERGY STAR® certified kitchen equipment. To meet ENERGY STAR's stringent requirements for energy efficiency, manufacturers use high-quality components and innovative technologies that often lead to other benefits such as shorter cook times, improved recovery times, higher production rates, and longer product lifetimes. Hawai'i Energy will provide incentives for ENERGY STAR's seven commercial food services equipment categories, including: fryers, griddles, hot food holding cabinets, ice |

Annual Plan | Program Year 2017 Appendix

makers, ovens, refrigerators and freezers, and steam cookers.

Energy Advantage - Small Business Direct Install Lighting (SBDIL)

Program Description

- Delivery Channel: Program
 Direct Install
- Budget Source: BHTR

Measures

- LED
 - Refrigerated Case to LED
 - o Exit Sign
 - A19 Incandescent to LED
 - o Decorative to LED
 - o MR16
 - o PAR CFL to LED
 - PAR CFL to PAR LED
 - PAR CFL to BR LED
 - PAR Halogen to PAR LED
 - o PAR Halogen to BR LED
 - T12 40W to LED
 - o A19 LED

Linear Fluorescent

- o T12 to T8
- T12 to T8 LED Instant Start
- o T12HO to T8
- o T12 to F17
- Custom Lighting
- Smart Strips
 - Occupancy-Sensored
 Power Strips
 - Water Conservation Device
 - Bathroom Faucet Aerator
 - o Kitchen Faucet Aerator
 - Low Flow Showerhead (Fixed & Handheld)

• Project Direct Cost

 Installation Cost & Cost Adder for Fixtures above or out of the reach of a 10' Ladder **Description**: The Energy Advantage Program (formerly the Small Business Direct Install Lighting program) offers customer rebates for the installation of energy efficient lighting for small businesses. The program will continue in PY18 to promote market uptake of these technologies by reducing first costs. In PY18 we will explore new offerings like smart strips and water conservation devices for multifamily common areas.

Delivery strategy: The Energy Advantage Program is delivered to customers by Trade Allies who provide everything from the initial audit to a complete installation.

Participation & Incentive Levels: PY18 participation and unit incentives are summarized in Appendix F.

Measure Notes: Energy Advantage Program retrofits provide a "Turnkey" program consisting of audits, installation by participating Hawaii Energy Participating contractors and a high level of subsidies by Hawai'i Energy, up to 100% of the cost of the installation.

The incentive levels in this program are based on \$0.28/kWh for first year savings resulting from the lighting retrofit. In many cases this level of incentive results in a free installation. In other cases where lower burn hours result in lesser savings, a small copayment may be required by the business owner. Small business customers receiving electric power under a Schedule "G" rate are eligible under this program. The program will target the 50,000 customers within the small business market that have limited time and expertise within their organizations to research lighting technology options, obtain financing and contract with lighting contractors to replace their older, less efficient lighting technologies.

Key targets include:

- Restaurants This sector has a low participation rate, low saturation of high efficiency equipment and high potential for energy savings. The direct install method has proven effective in generating attention and participation. It also allows the Program to gather information on equipment and operations, and present opportunities for greater energy savings through other programs, such as the ENERGY STAR[®] Kitchen Equipment program.
- Landlords-Tenants The landlord-tenant relationship provides challenges to making energy efficiency capital investments in properties and operations such as air conditioning and lighting upgrades. This funding is to create a program that works with landlords. This program will be targeted to provide landlords of small business schedule "G" customers with comprehensive audit, RFP and other support for energy saving projects that will drive down the energy cost of their tenants. Hard-to-reach, multifamily, schedule "J" customers may be eligible for a common area lighting upgrade through the SBDIL program, especially participants of the residential multifamily direct-install (MFDI) program.

Nonprofit Program

- Delivery Channel: Trade Ally Provided
- Budget Source: BHTR

Measures

- LED
 - Refrigerated Case to LED
 - o Exit Sign
 - A19 Incandescent to LED
 - o Decorative to LED
 - o MR16
 - o PAR CFL to LED
 - o PAR CFL to PAR LED
 - PAR CFL to BR LED
 - PAR Halogen to PAR LED
 - PAR Halogen to BR
 LED
 - o T12 40W to LED
 - o A19 LED

• Linear Fluorescent

- o T12 to T8
- T12 to T8 LED Instant Start
- o T12HO to T8
- o T12 to F17
- Custom Lighting
- Project Direct Cost
- Installation Cost & Cost Adder for Fixtures above or out of the reach of a 10' Ladder

Description: Similar to the Energy Advantage program the Nonprofit program offers higher customer rebates for the installation of energy efficient lighting for nonprofit organizations. The program is new for PY18 and will promote market uptake of these technologies by greatly reducing or eliminating first costs.

Program Description

Delivery strategy: The Nonprofit program will be delivered to customers by Trade Allies and Hawai'i Energy staff who provide everything from the initial audit to a complete installation.

Participation & Incentive Levels: PY18 Incentive budget is summarized in Appendix F.

Measure Notes: While many nonprofits in Hawai'i help fill significant community needs, they often face limited budgets and high operating costs that affect their ability to provide high-quality services. This situation creates pressure to reduce costs quickly, so when combined with minimal knowledge of energy-saving options, many nonprofit decision-makers often do not consider efficiency or behavior change as a viable option, when in reality it should be the foundational step.

A customized offering for nonprofits allows Hawai'i Energy to provide support for this unique sector and will include several, specialized services to carefully and effectively address their needs:

- Initial consult to identify best opportunities for energy savings
- Assistance with developing an RFP for services and getting the word out to local contractors
- Educational sessions on basic concepts of energy usage for commercial facilities, such as load profile and demand charges, efficiency vs. renewables, and interpretation of billing data
- Higher incentives for energy-saving measures (distributed to selected trade ally)

Hawai'i Energy will select a small cohort of 3-4 organizations through an application process and provide assistance with identifying savings opportunities and developing an RFP. Hawai'i Energy will provide higher incentive rates to contractors to encourage them to bid on projects. Organizations will select their contractor(s) of choice and collaborate with them to complete the specified projects.

Key targets include:

- **High usage organizations** with significant opportunities to reduce energy costs.
- Organizations that own their own facilities.

Organizations that provide services of significant need or reach particularly vulnerable populations

APPENDIX D Transformation Program Offerings

History

Market transformation seeks to identify, assess, and help overcome market barriers that inhibit residents and businesses from adopting energy-efficient technologies and practices. Formally initiated in PY11, the Program's market transformation efforts continue to become more robust and meaningful, as strong customer and participant relationships and increased knowledge of market nuances have led to the development of more specialized, thoughtful offerings. By collaborating with key stakeholders, clean energy allies, and community-based organizations, we continue to encourage greater participation and deepen community impact, as well as remain committed to servicing "hard-to-reach" ratepayers who are traditionally underserved by energy efficiency and conservation programs.

The Hawaii Energy Market Transformation programs fall within the following support segments: **behavior change**, **professional development and technical training**, **energy in decision-making**, **codes and standards**, **and clean energy collaboration**.

Key Objectives

The goal of the transformational program is to achieve lasting change in the market that results in energy savings within three to five years. The market transformation efforts complement the residential and business resource acquisition programs. The key objectives of the transformational program include the following:

- Leverage the work of others in the community to reach across all islands and ratepayers;
- Conflate transformational efforts with residential and business resource acquisition programs through community-based energy efficiency initiatives
- Implement projects that will reduce energy consumption in the state within a five year period;
- Leverage resources to support the development of self-sustaining efforts;
- Support the continued development of a robust Clean Energy Ally program to leverage energy industry professionals to multiply energy efficiency projects;
- Develop programs that support institutional change for energy efficiency that include strategic energy management, benchmarking and renewables integration;
- Identify and assess emerging technologies for development into demonstration projects and support the market introduction of new residential and commercial efficient technologies; and
- Increase energy literacy and help Hawai'i's residents and businesses make smart energy choices.

Focus Areas

Behavior Change

Behavior modification is the outreach and education work that influences daily decisions to result in lower energy use through efficiency and conservation. This approach is multifaceted, augments overall Hawai'i Energy marketing efforts and is tailored across different demographics to build a foundation of energy literacy, particularly in "hard-to-reach" or underserved communities. The delivery mechanisms are diverse and leverage community partnerships, gamification initiatives and social media in order to scale messaging while maximizing cost-effectiveness. Hawai'i Energy's behavior modification programs focus on communicating transformative messages and portfolio-wide participation through face-to-face engagement in community and grade school education, gamification solutions, social media and online tracking tools, and support of events coordinated by likeminded community organizations.

Community Workshops and Presentations

Hawai'i Energy's community workshops are designed to untangle the often confusing concepts behind energy usage and reduction to the average consumer. The workshops are provided in a group setting and the Program prioritizes using local facilitators who can creatively deliver the curriculum through fun, relatable exercises. Ideal audiences include community organizations, local businesses, and local and state government agencies with access to a large number of residential customers (e.g. municipalities, hotels, etc.). The Program utilizes existing relationships with public housing, faith-based organizations, community organizations, nonprofits, schools, utility companies, and others to reach underserved communities.

Because of the diverse and dynamic audience, leveraging the core competencies of key community partners is necessary to assist with the development of effective and innovative content that fosters action and encourages participation. The workshops may be coupled with additional enhanced engagement tools to further engage and help the participants consider ways to become energy-efficient.

Enhanced Engagement

An effective way to deploy initiatives is through enhanced engagement to strengthen program efficacy and influence real-world actions that reduce energy use. Gamified environments, interactive displays, competitions, and contests help nudge people to change their daily habits and continue the energy conversation in a fun, participatory manner.

These tools enable more productive interactions between facilitators/instructors/moderators and their audience, provide timely feedback on individual or collective progress towards a goal, and offer useful support systems to optimize the experience. The currently developed microsite as well as prototypes for an interactive display will serve as building blocks to explore new reach ways to reach residents.

Youth Energy Education & Events

Hawai'i Energy believes that a strong investment in youth audiences is a crucial part of sustaining Hawai'i's energy future, and seeks to equip students and youth-based organizations with the knowledge and tools to solve future energy issues. Educational resources provided by Hawai'i Energy and it's community affiliates will touch on a variety of energy efficiency topics, complete with multimedia, video content and gamified challenges. We will continue to sponsor the Honolulu Theater for Youth (HTY Honolulu Theater for the Youth (HTY) as they take Shocka, The Story of Energy & Hawai'i, statewide to reach an additional 10,000 students in the fall of 2018. We will also provide funding support to enable student access to more advanced energy industry conferences to help them gain exposure to critical policy and regulatory issues.

Professional Development & Technical Training

The Hawai'i Energy program continues to focus on technical training and professional development to create a workforce knowledgeable in energy efficiency. Our proposed initiatives in this focus area increase the core competencies for Clean Energy Allies, decision-makers, influencers and operators. Our approach addresses both the current (buyers and sellers) and future (students) market players to ensure the viability of long-term savings.

Clean Energy Ally Support

Formalized in 2014, the Hawai'i Energy Clean Energy Ally network plays a critical role in energy efficiency program delivery and savings acquisition through its established, trusted customer relationships.

Support will be primarily through education and training activities to ensure they have a firm foundation in the program offerings and guidelines and that they benefit from preferential access to networking events, professional sales, technical and certification trainings. Additionally, trade ally-specific events like "Cup-of-Joe" and recognition mechanisms will provide motivation for Clean Energy Ally participation and celebrate their accomplishments.

Targeted Ally Training Opportunities

Hawai'i Energy offers a portfolio of targeted training opportunities for Clean Energy Allies, such as efficiency sales training, and technical certification programs to advance their knowledge base and reputation.

• Energy Efficiency Sales and Financial Analysis

Education for energy industry professionals on how to successfully acquire approval for energy efficiency projects. Recent updates to this model included enhancing the trainings to include tools, templates and case studies to support market penetration of effective sales techniques.

• Real Estate Related Training

Courses for the commercial and residential real estate industry may include a Certified Green Real Estate Professional, Certified Green Lending Professional, or the Accredited Green Appraiser. Our goal is to build a group of green designated realtors that are at the center of transactions, helping buyers improve the efficiency of their home or building and sellers recoup value for those improvements.

Technical Training

Hawai'i Energy has seen significant impact through offering various vocational and technical training certification programs, which are designed to strengthen the growing energy efficiency market by certifying a highly-skilled work force. Hawai'i Energy offers these types of certification to working professionals who directly support commercial facilities in achieving and sustaining energy efficiency, and seeks out additional technical training sessions for energy-efficient technologies and practices in conjunction with manufacturers, suppliers, universities and allies. Offerings include the Certified Energy Manager (CEM) course and other HVAC and specialty lighting offerings.

• Co-Op Event Funding

In PY16, Hawai'i Energy launched its co-op event funding program for Clean Energy Allies, which maximizes cost-effectiveness by providing financial support for educational offerings incorporated into other industry events, such as trade ally sales calls, vendor "lunch & learns, professional association meetings (IES, ASHRAE, etc.) and trade shows. We will expand these efforts in PY18 to encourage more business-to-business and business-to-customer learning opportunities.

Targeted Participant Training Opportunities

In addition to the offers listed above, Hawai'i Energy's Energy Advisors will continue to identify customer-specific training opportunities. As we look to build capacity amongst trade allies so they can sell efficiency projects, we also recognize that decision-makers must have the skillsets to scope,

approve, procure and manage energy-saving projects. Training focuses on technical and business skills, including financial analysis and contracting basics.

• Organizational Support & Industry Sponsorships

Over the last two years, Hawai'i Energy has increased its sponsorship support and collaboration efforts with a number of industry organizations (Hawaii Hotel and Lodging Association, Hawaii Society for Healthcare Engineers, Hawaii RA, etc.) in order to make training opportunities more accessible and cost-effective for end-use customers. We will continue with targeted events for specific market segments, such as small business owners and healthcare providers.

• Facilities Management Training

The Program offers training for existing facilities staff, managers and technicians to support their role in implementing energy efficiency upgrades. This includes technical certifications, like the Building Operator Certification Level I and II offered through with University of Hawai'i's Manoa Outreach College and Maui College's Sustainable Living Institute of Maui (SLIM), as well as other workshops on HVAC, lighting, pumps, motors, etc. to be promoted throughout the year.

• Coordination with Federal Agencies

Agencies like the Small Business Administration (SBA) and the United States Department of Agriculture (USDA) provide a variety of loan or grant programs to support small businesses. For example, the USDA Rural Energy for America Program provides financial assistance to agricultural producers and rural small businesses in America to purchase, install, and construct renewable energy systems and make energy efficiency improvements to non-residential buildings and facilities. Hawai'i Energy will coordinate with these agencies to ensure we are incorporating information on available assistance programs in our customer communications and also supporting their clients with energy advising services.

Educator Training & Grants

In order to truly transform the market, the Program must build capacity for Hawai'i's future generation of education decision-makers. Hawai'i Energy and its external allies have worked with hundreds of teachers, and subsequently, thousands of students to develop a deeper understanding of Hawai'i's energy opportunities and challenges. The goals of the educator training include the following:

- Introducing energy concepts and the impact of energy efficiency in Hawai'i's dynamic energy conditions;
- Helping teachers craft lessons that will fit most appropriately in their classrooms; and
- Collaborating with teachers to assist with specific needs and help produce meaningful and highquality work from the students through mentorship and expert consultations.

Hawai'i Energy has convened with experienced stakeholders to design a cohesive roadmap of efforts that are underway. Teaming up with Engie and its *Ka Hei* program through the Department of Education (DOE), an approved curriculum has been developed to teach energy concepts which employ inquiry-based teaching methods. This is the first time an energy curriculum has been recognized by DOE. Teachers may enroll in the workshop courses which provide credits called 'Professional Development: Educate, Empower, Excel' (PDE3) credits, and subsequently, may increase a teacher's salary grade. Curriculum objectives for the educators will include the following:

• Integrate science, mathematics, engineering, art, and technology (STEAM) subjects to engage students in learning experiences that apply to real-word situations;

- Utilize inquiry-based learning and problem-based learning methods to investigate energy use and production in Hawai'i;
- Demonstrate understanding of the complex, dynamic picture of energy on the Hawaiian Islands including energy efficiency, conservation, and renewable energy principles;
- Teach grade level concepts in the classroom that align with Next Generation Science Standards (NGSS)/Common Core State Standards (CCSS); and
- Facilitate experiential exercises to inspire students and their families to make energy efficient choices.

A series of facilitated events will also identify effective areas of teacher professional development, to avoid duplicating efforts already underway by other entities, and to enhance connections among related parties in the energy education space that will spur collaboration and maximize efforts to reach students.

Energy Industry Workforce Development

Hawai'i Energy maintains a robust fellowship program to draw in high-caliber students and recent graduates into the energy industry, while providing cost-effective support to the Program. Fellows work on Hawai'i Energy programs as needed, including direct-install programs for the hard-to-reach sector and the Clean Energy Ally Program. These Hawai'i Energy fellows will be given assignments that will benefit the program coupled with professional mentorship and applicable training opportunities to grow their capacity, enhance their quality of work and groom them to enter the energy field with skills and first-hand experience. This year, the Program will leverage energy intern funding from the National Association of Regulatory Commissioners (NARUC), secured in coordination with the Hawai'i Public Utilities Commission, to expand our reach. Fellows and interns will work on Hawai'i Energy programs as needed, including integrated demand side management (IDSM) collaboration efforts, direct-install programs for the hard-to-reach sector and the Clean Energy Ally Program.

We will also be expanding vocational training on the Island of Molokai in collaboration with Hawaiian Electric. As Molokai proceeds towards its 100% clean energy by 2020 target, there will inevitably be additional electric vehicles being utilized. Currently the infrastructure to support the increased use of EVs is limited and there are no companies/locations outfitted to properly maintain the growing fleet. At the request of Hawaiian Electric, Hawai'i Energy is well positioned on being one of several partners bringing this training to Moloka'i to expand its existing technical training offerings to include maintenance of EVs. These courses would develop local workforce capacity to repair and service electric vehicles on island, further reducing the barriers to adoption.

Energy in Decision-Making

While the use of incentives plays a significant role in influencing energy-saving projects, the Program recognizes there are other barriers to participation and has been working to address them through specialized initiatives. These offerings employ comprehensive services and engagement tools to assist communities and end-use customers in making the best, fact-based decisions concerning their energy consumption over the immediate and long term.

The initiatives to influence and change energy decision-making focus on providing services, information and tools to change organizational and business practices. The efforts are targeted to specific and significant market sectors or consumer types. They also enhance customer engagement through building energy opportunity analysis, driving increased adoption of energy efficiency projects and practices.

Community-Based Energy Efficiency

Hawai'i Energy will bring a renewed, holistic approach to reducing the energy burden for hard-to-reach communities. Utilizing the resources, experience, and reach of specific community-based organizations, Hawai'i Energy will leverage these relationships to better understand the issues faced by these communities and groups. Whether the challenges are present in low-income, underserved, and vulnerable populations or found in residents that are asset limited and income restrained, Hawai'i Energy recognizes the need for customer equity and the obligation to provide access to energy efficiency resources to all demographics. The American Council for an Energy-Efficient Economy (ACEEE) describes low-income households as paying a disproportionate amount of their income in energy costs, up to three time as much, compared to other higher-income households. Additionally, the Aloha United Way's, *Asset Limited, Income Restrained, Employed* (ALICE) Report identifies 48% of Hawaii households either live below the poverty line or are considered ALICE families, defined as being above federal poverty levels but not having enough income to maintain a basic household budget.

By listening and tailoring approaches specific to their needs, Hawai'i Energy will connect with customers in deeper, more meaningful ways. Building on prior successes like the bulk purchase appliance program in Moloka'i a suite of resource acquisition measures from both the residential and commercial portfolio as well as transformational efforts will be offered to the community(s).

Strategic Energy Management (SEM)

Hawai'i Energy formally initiated its SEM program in PY16. SEM efforts provide continual guidance to larger organizations to affect ongoing improvements in their energy management practices so that more energy efficiency measures can be implemented. This makes it both a resource acquisition and market transformation effort.

In the last two years, the Program has introduced the processes of SEM through our Continuous Energy Improvement (CEI) initiatives and has been developing a set of tools and resources to assist large institutions in comprehensively planning for effective energy management as a critical part of their business decision making. We will continue our work with the University of Hawai'i and Kamehameha Schools to include staff training, communications to increase executive buy-in, energy studies, joint marketing promotions and integrating incentive payments with the customers' financial tracking systems. Initiatives will continue to be closely coordinated with business program strategies, and incorporate input received from our work with Vermont Energy Investment Corporation (VEIC) to ensure we are aligned nationally recognized best practices.

Hawai'i Energy is also in full-swing working with City and County of Honolulu and Hawai'i County staff to get the IECC 2015 code adopted, and will continue to advance energy efficiency at the county level. Infrastructure resiliency in the face of climate change is just one reason counties are focused on managing their energy consumption. Acknowledging that financial constraints are not always the barrier to county energy efficiency projects, the Program will be flexible to provide services and facilitate the conversations required to drive projects to completion.

Rural Water and Wastewater Support

Hawai'i Energy will coordinate with the Hawai'i Rural Water Association (HRWA) to assist small community water and wastewater utility systems by providing funding for a comprehensive energy assessment. These assessments will utilize water and electrical monitoring equipment Hawai'i Energy provided to HRWA in PY15 to audit selected water and wastewater system pumps and motors and evaluate equipment performance and efficiency. A review of the systems leak detection and water audit programs will also be included (if applicable) as part of the assessment. Data summary and findings to be reported with recommended energy efficiency improvements such as higher efficiency pump replacements or using a

variable speed drive to meet varying load conditions, pump check valve replacements, implement or improve systems leak detection and/or water audit programs. Hawaii Energy will help to offset the costs of upgrades identified with incentives and work with federal partners like the SBA and USDA to identify financing opportunities.

Data-Driven Customer Engagement

Hawai'i Energy continues to apply a data-driven approach to increase customer engagement. Building on the benchmarking efforts initiated in PY15, we have expanded use of data visualization tools to provide powerful charts and visuals to engage customers in a deeper dialogue. We will continue to increase our use of these types of screening analytics to improve targeting and engagement. These efforts deliver actionable customer intelligence allowing the Hawai'i Energy staff to build more relationships with commercial customers and further enhance cost-effectiveness and customer equity.

Codes and Standards Support

In PY18, proposed codes & standards activities are designed to actively encourage counties to adopt the 2015 IECC, support compliance to the new energy code, and provide a forum for dialogue around leadingedge strategies through the energy code process. Additionally, the commercial program will continue to ratchet up minimum efficiency levels required to receive incentives. This allows the Program to have meaningful dialogue with equipment distributors to minimize free-ridership and ensure Hawai'i Energy rebates continue to move the market. Finally, our team has developed a logic model, available in Appendix H, depicting the interventions we believe will further the impact of energy efficiency through our codes and standards activities. This model will guide how the Program will measure and propose energy savings attributable towards our resource acquisition goals. The PY18 Codes & Standards logic model illustrates the process of conducting activities to overcome barriers to code development, adoption and code compliance. Read top to bottom, inputs are provided, barriers identified, then activities and outcomes listed. Read left to right, the process is a timeline progressing from development to adoption to compliance.

PY18 Codes & Standards Actions

• Support adoption of IECC 2015, with Hawai'i amendments, in all counties.

We will continue to work with key stakeholders including county energy managers, the Department of Business Economic Development and Tourism (DBEDT), and the Blue Planet Foundation (BPF) to generate the necessary county-level support for adoption of the code. At the time of this writing, progress toward adoption remained at the departmental review stage, as indicated in Figure D-1.

| County Adoption of IECC 2015 | | | | |
|--|---------|----------|----------|------|
| | Hawai'i | Honolulu | Kaua'i | Maui |
| Departmental Review | Х | X | | Х |
| Early public comment | | | | |
| Introduction to County Council | | | Apr 2018 | |
| 1 st reading | | | | |
| Refer to committee for review or amendment (e.g. Public Works) | | | | |
| Public Hearing | | | | |
| 2 nd Reading (often passed concurrently with public hearing) (require to be published in newspaper after passing) (may be re-refered to committee, otherwise 3 rd reading) | | | | |
| 3 rd Reading | | | | |
| Mayor's signature (10-days to sign or becomes law) | | | | |
| Lead-in time to enforcement | | | | |

Figure Key: X = currently underway

The Program will target ten code adoption advocacy events for PY18. Hawai'i Energy will continue to uncover and address barriers to IECC 2015 adoption in each county, working closely with BPF to educate legislators, inform the industry stakeholders through email and external updates, and spread the word to the public through print media or outreach engagements. Past notable events include Opinion Editorials in the Honolulu Star Advertiser and individual legislative briefings with key policy makers including Senator Rosalyn Baker, Senator Lorraine Inouye, and Representative Chris Lee.

• Improve energy code compliance.

Using initial research into current levels of code compliance in both the residential and business sectors, along with a new study intended for publication by summer 2018 with a statistically significant analysis of state-wide energy code compliance to both IECC 2006 and 2015 levels, the Program will develop strategic interventions to prepare the industry for seamless compliance to the 2015 IECC, as indicated by the logic model (Appendix H) in the *Example of Intervention* row, under the *Code Compliance* column.

We will target seventy participant hours of engagement by developing and piloting intervention programs that improve compliance to the energy code. The purpose of the interventions is to take action on recommendations from the code compliance study and feedback gathered from stakeholder groups. The study will serve as a baseline of compliance, and interventions will be developed, executed, and measured to demonstrate the effectiveness of actions taken as a result of the compliance study. Interventions can be broad across the design industry or county planning departments. Interventions can also be technology specific, as might be informed by the compliance study.

• Standards Enhancement

Since PY16, Hawai'i Energy has required that new chillers exceed the IECC 2015 Energy Code minimum efficiency levels and we will continue this requirement in PY18. Savings will be based on the actual installed equipment efficiency compared to a code-minimum baseline. Furthermore, for conventional package and split air conditioning systems, Hawai'i Energy will require that equipment meet, at a minimum, the Consortium for Energy Efficiency (CEE) requirements, which are more stringent than 2015 IECC, thus continuing to push the industry to exceed the latest energy code even prior to adoption.

For new construction building projects, there are also opportunities to engage developers and the design community to encourage innovation and exceed minimum code requirements.

Along with exceeding the minimum code requirements, the Program will also increase its efforts in advocating for minimum product standards for electric appliances brought to the State. This is an extremely cost-effective, far-reaching approach to influencing the market toward energy efficient equipment, and with minimum cost impact to the consumer. California has instituted unique efficiency requirements for specific appliances and the Program may work with local research organizations to understand the market dynamics of appliances shipped to Hawai'i, their shelf life, and the impact California's appliance standards may have on Hawai'i in the absence of Hawai'i standards.

The Program will continue to leverage incentive requirements that guide and prepare the industry for future energy codes by aligning requirements with the next generation of standards. The Standards Enhancement target for PY18 is the implementation of three engagements to advance legislation for Hawai'i to explore and adopt state appliance efficiency standards.

• Investigate leading-edge technologies & strategies for integration with building code. In PY18, Hawai'i Energy will continue to chair the SBCC Investigative Committee on Energy Efficiency Code Coordination. This committee addresses leading-edge energy concepts, providing insight and support to the SBCC regarding the latest energy practices, as technology advances and further integrates with our habitable spaces. Conversation topics have included appliance standards, demand response in building codes, and mandatory benchmarking. Continuing the momentum from the institution of this committee in April 2017, the Program will convene quarterly meetings and produce a report of discussions and findings in PY18.

Clean Energy Collaboration

Integrated Demand-Side Management

We will continue the significant strides made within the formalized collaboration framework with the Hawaiian Electric Companies to work towards integrated demand-side management (IDSM) goals. The objective of this framework is to help increase the effectiveness of both parties' Demand Side Management (DSM) efforts, resulting in the most efficient use of customer dollars through shared learnings and alignment on common endeavors and identification of new partnership opportunities.

The Collaboration parties are committed to coordinate our incentives, education, Clean Energy Ally Network and planning efforts to assist the utilities towards the State's 100% renewable energy goal.

Focus areas include:

- *Planning* outlines data sharing between parties to develop forecasts for various end uses such as program design and system planning.
- *Outreach* coordinated efforts to engage and educate the public including education programs and workshops.
- *Programs* –joint development of DSM programs, ranging from technology identification to Use Case development, administering of pilots and ultimately the establishment of cost effective programs.

In PY18, we will build on our collaboration efforts with Hawaiian Electric's Demand Response team to dive deeper into load profiling for residential end use technologies. Together, we will be co-funding a grid interactive water heating (GIWH) project with Shifted Energy that will provide detailed water heating data and provide IDSM benefits to the hard-to-reach renter population. Given that solar water heating is tough to pursue in multi-family properties, this demonstration project will allow us to better understand water usage and duration of time for showers, temperature of water during showers, tank capacity for retaining heat, and the predictive load curve of existing water heaters.

Beyond the valuable data collection, this project will serve hard-to-reach ratepayers, like renters in multifamily dwellings, who have few choices to participate in grid services. We anticipate these efforts will help enhance our framework for direct renter engagement as installations are not permanent and do not impact water heater access or operation. Also, with time of use rates on the horizon, enabling utilities to help renters shift a large part of their load could bring ongoing economic relief to key ratepayers.

Innovation and Emerging Technologies

Emerging technologies are new, energy-efficient technologies, systems, or practices with significant energy savings potential that have not yet, for a variety of reasons, achieved sufficient market share to be considered self-sustaining or commercially viable. Emerging technologies may include prototypes, pre-commercial or recently commercialized equipment, as well as software, design tools, or energy services. In our efforts to build a pipeline of innovative projects incorporating emerging technologies, the Program will continue our ongoing work with the Elemental Excelerator (EEx) and VEIC. This includes companies targeting hard-to-reach sectors, smart grid technology, energy efficiency, home energy monitoring systems, demand response and water efficiency with energy savings.

In PY18, Hawai'i Energy will expand the scaled deployment of advanced in-home energy monitors as a platform for residential home energy diagnostic and engagement services. In close collaboration with Vermont Energy Investment Corporation (VEIC) and Sense Labs, a market leader in customer-focused advanced home energy monitoring, Hawai'i Energy is developing an enhanced offering that combines real-time, device and whole-home level energy data, machine learning, and human experts to deliver energy insights that are specific to the end-use (e.g. fridge, water heater, HVAC, electronics etc.) through the convenience of a modern smart phone app.

The service will primarily serve as an opt-in deployment of emerging "virtual sub-metering" technology to identify and assess the potential of home energy efficiency opportunities, provide a bi-directional engagement platform with customers and provide real-time feedback on the impact of homeowner actions. Additionally in PY18, Hawai'i Energy will evaluate opportunities with clean energy allies to inform individual home decisions supporting strategic electrification – including electric vehicles, renewable energy, energy storage and smart water heaters – as well as demand response and other time-of-use value through device-level insights.

Hawai'i has the most ambitious clean energy goals in the nation and to transform the way residents think about the state's energy future, Hawai'i Energy will continue to explore collaborations with public and private entities to provide an energy exhibit or display that will be accessible to all demographics. The combination of tactile, hands-on approaches coupled with digital technologies through interactive smart displays and exhibits provide an immersive user experience to tell the story of Hawai'i's clean energy transformation.

Locational Net Benefit Analysis

PY18 Hawai'i Energy will continue its data visualization work with Kevala (of the current EEx cohort) to expand our ability to quantify the value to the grid of individual energy efficiency measures for the purpose of supporting energy efficient incentives and refined targeting of energy efficiency programs. We anticipate this tool will allow market participants to analyze the costs and benefits of existing and forecasted technology adoption in relationship to utility infrastructure, the savings for potential Hawai'i Energy participants, demonstrate the benefits to ratepayers and model scenarios using open data and transparent analysis.

APPENDIX E Stakeholder Findings

On February 14, 2018 Hawai'i Energy hosted its first interactive stakeholder meeting to inform program design and PY18 planning efforts. Attendees included representatives from the Consumer Advocate, Aloha United Way, Maui Economic Development Board, Hawai'i Green Growth, Oahu Economic Development Board, PUC, HECO, HNEI, Blue Planet Foundation, Ulu Pono, Kamehameha Schools, Chamber of Commerce Small Business Program, EPA, City and County of Honolulu, HCATT and DERC.

Facilitated in collaboration with the Elemental Excelerator, the meeting fostered meaningful dialogue around the ways the Program can evolve in order to continue to play a pivotal role in Hawai'i's dynamic energy landscape. Through these efforts we were able to identify key initiatives that Hawai'i Energy can implement to drive energy efficiency and economic growth, improve resiliency, and enable a 100% clean energy future. The group work focused on **defining the purpose of suggested initiatives, pinpointing specific actions that need to take place in order to enable them, and identifying the metrics that could be used to measure success**. The table below summarizes some of the key takeaways from the meeting.

| Initiatives | Purpose | Actions | Metrics | | | | | |
|---|---|---|--|--|--|--|--|--|
| Low Income/ALICE | Reduce overall monthly cost of utilities for ALICE population | Focus groups- understand families and their actions/behaviors, figure out the incentives that drive them | % of ALICE population coming down | | | | | |
| | Increase participation in EE initiatives, grow | Financial literacy, personal visibility into monthly costs | Household occupancy numbers and trends | | | | | |
| | education/awareness | Research low-income rates from the utility (can they be developed) EE benefit sharing between | % of 211 calls regarding utility assistance | | | | | |
| | | landlords and tenants | | | | | | |
| | | How can AUW leverage 211 to educate? Mobilize to drive action? | # of ALICE households | | | | | |
| Energy Efficiency as a Grid Resource | Utilize EE as a resource to manage grid constraints, | Formally introduce iDSM to PUC as a program with specific metrics | Defined at the meter level rather than the end use | | | | | |
| | integrate renewables, optimize behind the meter consumption | HE involvement in national agencies that promote the integration of control technologies with end uses | GHG reduction metrics | | | | | |
| | | Commercial layering – maximize EE while pursuing DR | Measure effect on peak and trough | | | | | |
| | | Revisit EEPS | Define for individual | | | | | |
| | | Time based rates | customers – locational targets | | | | | |

| Initiatives | - Purpose | Actions | Metrics |
|---|--|--|--|
| Energy Efficiency and Transportation | Develop incentives to support policy and plans that reduce fuel use and increase efficiency – bundle EE incentives with EV or multimodal transportation incentives Develop special programs to expand mandates into transportation space - Car buy back Workplace charging | PUC application to allow for a demo project to expand the program Engaging stakeholders to recognize and support the value of experimentation in this space. Identify community leaders to advocate on behalf of HE, let community have leaders come forward #hashtag - go viral | This is a challenge, but consider directional metrics instead of discrete |
| Education and Training / Workforce Development | Make energy efficiency sexy! | Increase total budget and % for Transformational programs Reframing EE – develop school programs, targeted outreach to ALICE population Reframe millennials as "rebounder generation" – give them the platform and permission to succeed and contribute | Existing metrics + community led events Number of community leaders as place-based campus Number of student advocates TBD- ask the community! |
| Codes and Standards | Drive code adoption at state, city/county level within two years of publication Move toward a performance based code | Collaboration w/DPP with focus on COI exception Calculate long term cost of living savings and efficient use of resources Increase flexibility with Provide funding for SBCC Collaboration with non- conventional advocates (unions, environmental organizations) | Number of early adopters before code is enhanced Ranking against other states in timing on code adoption Number of unique voices participating- at least 10 groups |

Appendix F Summary of Programs by Measure

| | Incentives Residential Resource Acquisition Programs Business Resource Acquisition Programs Sub-Total: Resource Acquisition Programs | | \$ | PY18 \$7,589,588.65 \$11,298,334.61 18,887,923 | 40.2% 59.8% | Resource Acquisition Residential Program Business Program Total Program | | kW 11,852 9,359 21,211 | kWh 46,378,144 81,185,602 127,563,746 | kW TRB \$39,467,563 \$54,820,773 \$94,288,336 | kWh TRB \$72,175,730 \$168,297,807 \$240,473,537 | TRB \$111,643,293 \$223,118,580 \$334,761,873 | Avg \$/kWh \$0.1636 \$0.1392 \$0.1481 | Avg. Life 10.7 14.2 12.9 | Cost-Effectiveness Residential Program Business Program Total Program | TRC \$34,173; \$45,567; \$79,741, |
|--|---|--------------------------------------|----------------------------------|---|-------------------|--|-------------------------------------|------------------------------------|--|--|---|---|--|-----------------------------------|--|--|
| | Incentives Residential Transformation Business Transformational Sub-Total: Transformational | nal Programs Programs Programs | \$ \$ \$ | PY18 1,051,373 1,098,627 2,150,000 | - | | | Occurry Long | Decement laws | | | | | | | |
| | Quantity | Unit | Average Incentive per Unit | Incentive Budget per Measure | % of Budget | Demand Savings per Unit (kW) | Energy Savings per Unit (kWh) | 1st Year Demand Savings (kW) | 1st Year Energy Savings (kWh) | Demand Derived TRB | Energy Derived TRB | Utility Avoided Cost Total Resource Benefit (TRB) | Program-Level 1st Year \$/kWh | Measure Life | Average TRC per Unit | Total Reso Cost (TRC) |
| ect Incentives | | | | | | | | | | | | | | | | |
| RESIDENTIAL RESOURCE ACQUISITION | | | | | | | | 0.227 | 42 454 454 | 622 242 046 | 600 4 45 272 | 6402 450 240 | | | | 600 C |
| REEM | | | | \$6,272,063 | 33.2% | | | 9,237 | 43,451,454 | \$33,313,046 | \$69,145,272 | \$102,458,318 | | | | \$30,68 |
| Behavioral Energy Awareness / Responsibility | 207,000 | | | \$1,311,000 | 6.9% | 6 | | 4,053 | 12,159,563 | 0 | 2,139,220 | 2,139,220 | | | | |
| Peer Group Comparison - Quarterly Paper Report | 207,000 | each | \$6.33 | \$1,311,000 | 6.9% | i 0.0177 | 53.1 | 4,053.2 | 12,159,562.5 | \$0.00 | \$2,139,220.25 | \$2,139,220.25 | \$0.1078 | 1 | \$6.33 | \$1,3 |
| Upstream High Efficiency Lighting: LED | 1,374,642 | | | \$2,036,963 | 10.8% | 6 | | 2,800 | 19,687,366 | \$18,798,893 | \$42,822,487 | \$61,621,380 | | | | \$1 |
| LED (upstream) | 1,374,642 | each | \$1.48 | \$2,036,963 | 10.8% | 0.0032 | 22.5 | 2,800.0 | 19,687,366.5 | \$18,798,893.22 | \$42,822,487.20 | \$61,621,380.42 | \$0.1035 | 15 | \$7.41 | \$10,1 |
| Scheduling & Control Systems: Occupancy Controls, Sensors & Timers Room Occupancy Sensors & Timers (upstream) | 3,000 | each | \$6 | \$25,500 | 0.1% | o 6 0.0000 | 20.8 | 13 | 9.086.4 | \$30,308 | \$124,940 | \$155,249 \$11.590.89 | \$0.3302 | 8 | \$30.00 | 5 5 |
| Advanced Power Strip - Tier I (upstream) | 2,500 | each | \$9 | \$22,500 | 0.1% | 0.0060 | 62.4 | 13.1 | 136,361.1 | \$30,308.41 | \$113,349.25 | \$143,657.66 | \$0.1650 | 5 | \$24.23 | i ș |
| High Efficiency Electronics: Televisions Electronics - TVs | 18,000 15,000 | each | \$10 | \$174,000 \$150,000 | 0.9% | 6 0.0100 | 82.7 | 136 | 1,200,817 1,084,592.1 | \$394,119 \$376,602.86 | \$1,198,392 \$1,066,855.39 | \$1,592,511 \$1,443,458.25 | \$0.1383 | 6 | \$50.00 | 57 |
| Electronics - Soundbars | 3,000 | each | \$8 | \$24,000 | 0.1% | 6 0.0020 | 44.3 | 5.2 | 116,225.0 | \$17,516.59 | \$131,536.13 | \$149,052.72 | \$0.2065 | 7 | \$40.00 |) \$1 |
| High Efficiency Appliances | 10,000 | | | \$832,500 | 4.4% | 6 | | 702 | 4,195,256 | \$4,465,133 | \$8,631,425 | \$13,096,558 | | | | s |
| Garage Refrigerator / Freezer Bounty (Customer incentive) | 1,000 | each | \$75 | \$75,000 | 0.4% | 0.1400 | 859.0 | 122.4 | 751,221.3 | \$778,963.93 | \$1,545,581.56 | \$2,324,545.49 | \$0.0998 | 14 | \$375.00 | \$3 |
| Garage Refrigerator / Freezer Bounty (Recycler Incentive) Refrigerator (with Recycling of Old) | 1,000 | each each | \$25 \$150 | \$25,000 \$600.000 | 0.1% | 6 0.0000 6 0.1340 | 0.0 822.0 | 468.7 | 2.875.454.6 | \$0.00 \$2.982.319.06 | \$0.00 \$5.916.032.79 | \$0.00 \$8.898.351.85 | \$0.0000 \$0.2087 | 14 | \$125.00 \$750.00 | , Ş1 J \$3.0 |
| Clothes Washers - Tier II | 2,000 | each | \$30 | \$60,000 | 0.3% | 6 0.0300 | 156.8 | 52.5 | 274,252.6 | \$333,841.69 | \$564,254.22 | \$898,095.91 | \$0.2188 | 14 | \$150.00 |) \$3 |
| Clothes Washers - Tier III Clothes Drvers | 500 1.500 | each each | \$40 \$35 | \$20,000 \$52,500 | 0.1% | 6 0.0340 6 0.0330 | 176.4 165.6 | 43.3 | 77,120.4 217.207.0 | \$94,588.48 \$275.419.39 | \$158,669.51 \$446.887.18 | \$253,257.99 \$722,306.58 | \$0.2593 \$0.2417 | 14 | \$200.00 \$175.00 |) \$1) \$2 |
| High Efficiency HVAC | 1,750 | | | \$87,500 | 0.5% | 6 | | \$68 | 259,552 | \$408,819 | \$592,258 | \$1,001,078 | | | | |
| Solar Attic Fans Whole House Fans | 250 | each | \$50 | \$12,500 | 0.1% | 6 0.0000 6 0.1020 | 158.0 | 0.0 | 34,543.9 138,429,4 | \$0.00 | \$93,804.21 | \$93,804.21 | \$0.3619 | 20 | \$250.00 |) Ş D Š1 |
| Window AC with Recycling (Customer Incentive) | 500 | each | \$50 | \$25,000 | 0.1% | 6 0.0540 | 198.0 | 23.6 | 86,578.5 | \$95,897.05 | \$122,548.50 | \$218,445.55 | \$0.2888 | 9 | \$250.00 | J \$1 |
| Window AC with Recycling (Recycler Incentive) | 500 | each | \$25 | \$12,500 | 0.1% | 0.0000 | 0.0 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | \$0.0000 | 9 | \$125.00 | / \$ |
| Pool VFD Controller Pumps | 250 | each | \$100 | \$25,000 | 0.1% | 6 0.0060 | 597.2 | 1.3 | 130,573.9 | \$5,695.65 | \$202,563.24 | \$208,258.89 | \$0.1915 | 10 | \$500.00 | s1 د |
| On-Line Retail | 7.000 | | | \$44.600 | 0.2% | 4 | | 180 | 250.010 | \$478 558 | \$340.036 | \$818 595 | | | | |
| LED (online) | 5,000 | each | \$5.00 | \$25,000 | 0.1% | 6 0.0032 | 22.5 | 14.0 | 98,384.6 | \$93,944.61 | \$213,998.88 | \$307,943.49 | \$0.2541 | 15 | \$25.00 | J \$1 |
| Advanced Power Strip - Tier I (online) | 750 | each | \$10.00 | \$7,500 | 0.0% | 0.0060 | 62.4 | 3.9 | 40,908.3 | \$9,092.52 | \$34,004.77 | \$43,097.30 | \$0.1833 | 5 | \$50.00 |) \$ |
| Aerator Bathroom (online) | 100 | each | \$1.00 | \$150 | 0.0% | 6 0.2150 6 0.3480 | 140.9 | 30.4 | 12,324.8 | \$70,315.52 | \$10,244.87 | \$80,560.39 | \$0.0122 | 5 | \$7.50 | 3 |
| Showerhead (online) | 150 | each | \$3.00 | \$450 | 0.0% | 0.5920 | 127.9 | 77.7 | 16,776.5 | \$179,425.81 | \$13,945.39 | \$193,371.21 | \$0.0268 | 5 | \$15.00 | , |
| Trade Ally Provided | 750 | each | \$15.00 | \$11,250 | 0.1% | . 0.0120 | 119.2 | 7.9 | 76,163.0 | \$18,185.05 | \$64,989.08 | \$65,174.15 | 50.1459 | 5 | \$75.00 | |
| High Efficiency HVAC | 2,520 | | 6150 | \$445,000 | 2.4% | 6 0.2350 | 910 7 | 603.5 | 2,202,444.9 | \$4,051,713.81 | \$4,790,593.35 | \$8,842,307.17 | 60.2002 | 15 | 6750.00 | \$ |
| VRF Split System AC 2-3 tons | 2,000 | each | \$250 | \$125,000 | 0.7% | 0.2250 0.4530 | 1,652.3 | 198.1 | 722,488.6 | \$1,329,903.45 | \$1,571,503.14 | \$2,901,406.60 | \$0.1730 | 15 | \$1,250.00 |) \$6 |
| Central AC Retrofit | 20 | each | \$1,000 | \$20,000 | 0.1% | 0.6780 | 2,640.4 | 11.9 | 46,181.8 | \$79,618.06 | \$100,451.26 | \$180,069.33 | \$0.4331 | 15 | \$5,000.00 | ı \$1 |
| Smart Thermostats | 750 | each | \$50 | \$37,500 | 0.2% | 6 0.0000 | 138.0 | 0.0 | 90,533.5 | \$0.00 | \$152,399.97 | \$152,400 \$152,399.97 | \$0.4142 | 11 | \$250.00 |) \$1 |
| High Efficiency Water Heating | 1,770 | | 4250 | \$1,252,500 | 6.6% | | | 679.2 | 3,129,890.4 | \$4,679,804.56 | \$8,150,957.06 | \$12,830,761.61 | 40.4700 | 10 | 41.050.01 | \$1 |
| PV Water Heating | 150 | each | \$750 | \$37,500 \$75,000 | 0.2% | 6 0.2100 6 0.4600 | 2,057.0 | 40.2 | 179,890.8 | \$270,090.77 | \$334,558.51 \$391,285.06 | \$454,167.18 \$661,375.83 | \$0.1739 | 10 | \$1,250.00 |) \$6 |
| Solar Water Heater (SWH) Incentive | 1,500 | each | \$750 | \$1,125,000 | 6.0% | 0.4600 | 2,057.0 | 603.4 | 2,698,362.3 | \$4,233,656.36 | \$7,327,414.62 | \$11,561,070.99 | \$0.4169 | 20 | \$6,600.00 | ر \$9,9 د د د |
| | 20 | each | \$750 | \$15,000 | 0.1% | . 0.4600 | 2,037.0 | 8.0 | 35,978.2 | \$50,446.75 | \$97,698.86 | \$154,147.61 | \$0.4169 | 20 | \$6,800.00 | |
| | | | | \$125,000 | 0.7% | | | 0 | 262,359 | ŞU | \$371,359 | \$371,359 | | | | \$6. |
| TBD | 300,000 | | | \$125,000 | 0.7% | 6 | | 0.0 | 262,359 | \$0 | \$371,359 | \$371,359 | | | | |
| New Construction | 200,000 | kWh | \$0.25 | \$50,000 | 0.3% | 6 0.0000 | 1.0 | 0.0 | 174,906.0 | \$0.00 | \$247,572.72 | \$247,572.72 | \$0.2859 | 9 | \$1.25 | , \$2 c c2 |
| Emerging rech. & innovation | 100,000 | RVVII | \$0.75 | \$75,000 | 0.4% | . 0.0000 | 1.0 | 0.0 | 87,433.0 | \$0.00 | 5125,786.56 | \$125,786.36 | \$0.8376 | 9 | \$3.75 | ¢2.0 |
| RESIVI Trade Ally Bravided | | | | \$418,750 | 2.2% | | | 207 | 1,180,845 | \$146,491 | \$564,495 | \$710,985 | | | | \$2,0 |
| Commissioning / Recommissioning | 4,750 | | | \$418,750 | 2.2% | 6 | | \$207 | 1,180,845 | \$146,491 | \$564,495 | \$710,985 | | | | \$ |
| Central, VRF Air Conditioning Tune up Solar Water Heater Tune Un | 2,250 | each | \$75 \$100 | \$168,750 | 0.9% | 6 0.0730 0.0290 | 323.5 | 143.6 | 636,450.1 544 394 9 | \$0.00 | \$111,970.07 \$452 524 66 | \$111,970.07 | \$0.2651 \$0.4592 | 1 | \$375.00 \$500.00 | / \$8 0 \$1.2 |
| | 1,500 | cuch | \$100 | 6772 776 | 4 4 0/ | 0.0250 | 249.0 | 2 407 | 1 402 407 | ¢c 000 037 | ¢2.004.004 | ¢0.100.001 | Ş0.4552 | 2 | \$300.00 | 67 |
| REAL REAL REAL REAL REAL REAL REAL REAL | | | | \$773,776 | 4.1% | | | 2,407 | 1,483,487 | \$6,008,027 | \$2,094,604 | \$8,102,631 | | | | \$7. |
| R Scheduled Multi-Family Direct Install (Energy Smart 4 Homes) | 25,140 | | | \$534,776 | 2.8% | 6 | | 2,336 | 1,109,050 | \$5,602,126 | \$1,360,049 | \$6,962,175 | | | | |
| Advanced Power Strips - Tier I Aerator Bathroom | 3,900 | each | \$24.23 | \$94,497 | 0.5% | 0.0060 | 62.4 | 25.9 | 269,270.0 | \$59,849.53 \$1,144,046,72 | \$223,828.90 | \$283,678.43 | \$0.3509 | 5 | \$24.23 | , ş |
| Aerator Kitchen | 1,600 | each | \$8.51 | \$13,616 | 0.1% | 6 0.3480 | 123.8 | 616.4 | 219,256.8 | \$1,424,111.83 | \$182,255.80 | \$1,606,367.62 | \$0.0621 | 5 | \$8.51 | 1 Ş |
| LED A19 | 11,000 | each | \$6.50 | \$71,500 | 0.4% | 0.0032 | 22.5 | 39.0 | 273,982.5 | \$261,617.91 | \$595,946.24 | \$857,564.16 | \$0.2610 | 15 | \$6.50 | / \$ |
| LED G25 Globe | 1,750 | each | \$9.43 | \$16,503 | 0.0% | 6 0.0032 | 22.5 | 6.2 | 43,588.1 | \$41,621.03 | \$94,809.63 | \$136,430.66 | \$0.3786 | 15 | \$9.43 | s ş |
| Showerhead Fixed | 1,000 | each | \$15.80 | \$15,800 | 0.1% | 0.7180 | 160.0 | 794.8 | 177,120.0 | \$1,836,408.57 | \$147,229.82 | \$1,983,638.39 | \$0.0892 | 5 | \$15.80 | , , |
| Site Visit Fee | 450 3,000 | eacn each | \$23.32 | \$10,494 \$294,330 | 0.1% | 6 0.7180 6 0.0000 | 160.0 | 0.0 | /9,704.0 0.0 | \$826,383.86 | \$0.00 | \$892,637.28 \$0.00 | \$0.1317 | 5 | \$23.32 \$98.11 | 1 \$2 |
| Special Need Opportunities | 670 | aadh | 69.000 | \$239,000 | 1.3% | 6 | 2 052 0 | 71 | 374,436 | 405,901 | 734,555 | 1,140,456 | 62.5102 | | 60.000.00 | |
| Window AC with Recycling | 360 | each | \$150 | \$54,000 | 0.4% | 0.0540 | 2,057.0 | 21.5 | 22,343.3 78,907.0 | \$87,399.85 | \$111.689.77 | \$199,089.62 | \$0.6844 | 20 | \$6,000.00 | د . غ د |

| \$34,173,916 | 3.27 | 495.140.011 | \$0.0153 | Residential Program | 56.823.439 | 682,374,009 | | | | |
|--------------------|-----------|----------------|----------------------|---------------------|-----------------------|-----------------------|--|--|--|--|
| \$45,567,896 | 4.90 | 1.152.006.293 | \$0.0098 | Business Program | 94.232.175 | 1.341.594.489 | | | | |
| \$79,741,812 | 4.20 | 1,647,146,304 | \$0.0115 | Total Program | 152,405,876 | 2,027,808,761 | | | | |
| | | | | | | | | | | |
| | | | | Customer Savings | 1st Year Bill Savings | Lifetime Bill Savings | | | | |
| | | | | Residential Program | \$16,762,914 | \$201,300,333 | | | | |
| | | | | Business Program | \$21,626,284 | \$307,895,935 | | | | |
| | | | | Total Program | \$38,389,199 | \$509,196,268 | | | | |
| | | Program-Level | | Customer-Level | Customer-Level | Customer-Level | | | | |
| Total Resource | TRB / TRC | Lifetime | Program-Level | 1st Year | 1st Year | Lifetime | | | | |
| Cost | Ratio | Energy Savings | Lifetime | Demand Savings | Energy Savings | Energy Savings | | | | |
| (TRC) | | (kWh) | \$/kWh | (kW) | (kWh) | (kWh) | | | | |
| | | () | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| \$30,681,391 | | 475,631,878 | | | 55,183,137 | 667,214,179 | | | | |
| | | | | | | | | | | |
| 1,311,000 | | 12,159,563 | | 3,661 | 10,984,248 | 10,984,248 | | | | |
| \$1,311,000.00 | 1.6 | 12,159,562.5 | \$0.1078 | 3,661.4 | 10,984,248.0 | 10,984,248.0 | | | | |
| *** *** | | | | 4 200 | | | | | | |
| \$10,184,815 | (1 | 295,310,497 | ¢0.0000 | 4,399 | 30,929,447 | 463,941,710 | | | | |
| \$10,164,815.77 | 0.1 | 295,510,496.8 | \$0.0069 | 4,398.9 | 30,929,447.3 | 403,941,709.7 | | | | |
| \$15,000,00 | 0.8 | 72 690 9 | \$0.0413 | 0.0 | 10 390.0 | 83 120 0 | | | | |
| \$60,575.00 | 2.4 | 681,805.5 | \$0.0330 | 15.0 | 155,925.0 | 779,625.0 | | | | |
| \$870,000 | | 7,321,128 | | 156 | 1,373,100 | 8,371,500 | | | | |
| \$750,000.00 | 1.9 | 6,507,552.6 | \$0.0231 | 150.0 | 1,240,200.0 | 7,441,200.0 | | | | |
| \$120,000.00 | 1.2 | 813,575.3 | \$0.0295 | 6.0 | 132,900.0 | 930,300.0 | | | | |
| | | FO 700 FO - | | | | | | | | |
| \$4,162,500 | 6.2 | 58,733,583.5 | 60 0071 | 803 | 4,797,155 | 67,160,170 | | | | |
| \$375,000.00 | 0.2 | 10,517,097.8 | \$0.0071 | 140.0 | 859,000.0 | 12,028,000.0 | | | | |
| \$3,000,000,00 | 3.0 | 40.256.365.0 | \$0.0149 | 536.0 | 3,288,000,0 | 46.032.000.0 | | | | |
| \$300.000.00 | 3.0 | 3.839.536.5 | \$0.0156 | 60.0 | 313.600.0 | 4.390.400.0 | | | | |
| \$100,000.00 | 2.5 | 1,079,686.0 | \$0.0185 | 17.0 | 88,185.0 | 1,234,590.0 | | | | |
| \$262,500.00 | 2.8 | 3,040,898.2 | \$0.0173 | 49.5 | 248,370.0 | 3,477,180.0 | | | | |
| \$437,500 | | 4,238,672.0 | | 78 | 296,790 | 4,846,800 | | | | |
| \$62,500.00 | 1.5 | 690,878.7 | \$0.0181 | 0.0 | 39,500.0 | 790,000.0 | | | | |
| \$187,500.00 | 3.7 | 2,768,587.1 | \$0.0135 | 51.0 | 158,290.0 | 3,165,800.0 | | | | |
| \$125,000.00 | 1./ | //9,206.2 | \$0.0321 | 27.0 | 99,000.0 | 891,000.0 | | | | |
| \$125.000 | 0.0 | 1.305.739 | 50.0000 | 2 | 149.308 | 1.493.075 | | | | |
| \$125,000.00 | 1.7 | 1,305,738.9 | \$0.0191 | 1.5 | 149,307.5 | 1,493,075.0 | | | | |
| | | | | | | | | | | |
| \$223,000 | | 2,233,895 | | 206 | 285,879 | 2,554,395 | | | | |
| \$125,000.00 | 2.5 | 1,475,769.4 | \$0.0169 | 16.0 | 112,500.0 | 1,687,500.0 | | | | |
| \$37,500.00 | 1.1 | 204,541.6 | \$0.0367 | 4.5 | 46,777.5 | 233,887.5 | | | | |
| \$1,250.00 | 88.4 | 17,162.7 | \$0.0146 | 53.3 | 3,925.0 | 19,625.0 | | | | |
| \$750.00 | 107.4 | 83 882 7 | \$0.0024 | 34.6 | 14,095.0 | 70,403.0 | | | | |
| \$56,250.00 | 1.5 | 390.914.9 | \$0.0288 | 9.0 | 89.400.0 | 447.000.0 | | | | |
| | | | | | | | | | | |
| \$2,225,000 | | 33,036,673 | | 690 | 2,518,433 | 37,776,489 | | | | |
| \$1,500,000.00 | 3.8 | 21,506,616.7 | \$0.0139 | 450.0 | 1,639,480.0 | 24,592,200.0 | | | | |
| \$625,000.00 | 4.6 | 10,837,328.8 | \$0.0115 | 226.5 | 826,145.0 | 12,392,175.0 | | | | |
| \$100,000.00 | 1.8 | 692,727.5 | \$0.0289 | 13.6 | 52,807.6 | 792,114.0 | | | | |
| \$187,500.00 | 0.8 | 995 868 9 | \$0.0377 | 0.0 | 103,523 | 1 138 747 5 | | | | |
| \$10,879,500 | 0.0 | 59.541.763 | 50.0377 | 777 | 3.578.940 | 68.084.300 | | | | |
| \$187,500.00 | 2.4 | 2,156,591.0 | \$0.0174 | 31.5 | 246,600.0 | 2,466,000.0 | | | | |
| \$660,000.00 | 1.0 | 2,698,362.3 | \$0.0278 | 46.0 | 205,700.0 | 3,085,500.0 | | | | |
| \$9,900,000.00 | 1.2 | 53,967,246.3 | \$0.0208 | 690.0 | 3,085,500.0 | 61,710,000.0 | | | | |
| \$132,000.00 | 1.2 | 719,563.3 | \$0.0208 | 9.2 | 41,140.0 | 822,800.0 | | | | |
| \$625.000 | | 2,361.231 | | | 300.000 | 2.700.000 | | | | |
| | | | | | | | | | | |
| \$625,000 | | 2,361,231 | | 0 | 300,000 | 2,700,000 | | | | |
| \$250,000.00 | 1.0 | 1,574,154.0 | \$0.0318 | 0.0 | 200,000.0 | 1,800,000.0 | | | | |
| \$375,000.00 | 0.3 | 787,077.0 | \$0.0953 | 0.0 | 100,000.0 | 900,000.0 | | | | |
| \$2 093 750 | | 3 358 425 | | | 1 350 263 | 3 840 263 | | | | |
| <i>\$2,033,130</i> | | 3,330,423 | | | 1,350,203 | 3,040,203 | | | | |
| \$2,093,750 | | 3,358,425 | | 164 | 1.350.263 | 3.840.263 | | | | |
| \$843,750.00 | 0.1 | 636,450.1 | \$0.2651 | 164.3 | 727,762.5 | 727,762.5 | | | | |
| \$1,250,000.00 | 0.5 | 2,721,974.6 | \$0.0918 | 72.5 | 622,500.0 | 3,112,500.0 | | | | |
| \$772 776 | | 12 700 /70 | | | 1 240 202 | 12 459 920 | | | | |
| \$775,776 | | 13,760,478 | | | 1,540,502 | 12,459,830 | | | | |
| \$E24 776 | | 9 905 643 | | 2 110 | 1 001 053 | 7 054 540 | | | | |
| \$94.497.00 | 3.0 | 1.346.350.0 | \$0.0702 | 2,110 | 243,243,0 | 1 216 215 0 | | | | |
| \$15,435.00 | 76.1 | 188,300.7 | \$0.0820 | 447.3 | 34,020.0 | 170,100.0 | | | | |
| \$13,616.00 | 118.0 | 1,096,284.2 | \$0.0124 | 556.8 | 198,064.0 | 990,320.0 | | | | |
| \$71,500.00 | 12.0 | 4,109,737.5 | \$0.0174 | 35.2 | 247,500.0 | 3,712,500.0 | | | | |
| \$2,601.00 | 10.2 | 127,028.3 | \$0.0205 | 1.1 | 7,650.0 | 114,750.0 | | | | |
| \$16,502.50 | 8.3 | 653,821.9 | \$0.0252 | 5.6 | 39,375.0 | 590,625.0 | | | | |
| \$15,800.00 | 125.5 | 885,600.0 | \$0.0178 | 718.0 | 160,000.0 | 800,000.0 | | | | |
| \$10,494.00 | 85.1 | 396,520.0 | \$0.0263 \$0.0000 | 323.1 | 72,000.0 | 560,000.0 | | | | |
| \$239.000 | 0.0 | 4,982.835 | ÷0.0000 | 64 | 338.450 | 4,505.320 | | | | |
| \$80,000.00 | 1.2 | 450,865.6 | \$0.1774 | 4.6 | 20,570.0 | 411,400.0 | | | | |
| \$54,000.00 | 3.7 | 710,162.6 | \$0.0760 | 19.4 | 71,280.0 | 641,520.0 | | | | |
| \$105,000.00 | 8.0 | 3,821,806.8 | \$0.0275 | 40.2 | 246,600.0 | 3,452,400.0 | | | | |

| Quantity | Unit | Average Incentive per Unit | Incentive Budget per Measure | % of Budget | Demand Savings per Unit (kW) | Energy Savings per Unit (kWh) | Program-Level 1st Year Demand Savings (kW) | Program-Level 1st Year Energy Savings (kWh) | Demand Derived TRB | Energy Derived TRB | Utility Avoided Cost Total Resource Benefit (TRB) | Program-Level 1st Year \$/kWh | Measure Life | Average TRC per Unit | Total Resource Cost (TRC) | TRB / TRC Ratio | Program-Level Lifetime Energy Savings (kWh) | Program-Level Lifetime \$/kWh | Customer-Level 1st Year Demand Savings (kW) | Customer-Level 1st Year Energy Savings (kWh) | Customer-Level Lifetime Energy Savings (kWh) |
|----------|---------------|----------------------------------|------------------------------------|-------------------|------------------------------------|-------------------------------------|---|--|--------------------------|----------------------------------|---|-------------------------------------|-----------------|----------------------------|---------------------------------|--------------------|--|-------------------------------------|--|---|---|
| | | | \$3,437,25 | 4 18.2% | | | 4,429 | 35,892,827 | \$28,989,492 | \$77,151,668 | \$106,141,161 | | | | \$17,186,268 | | 532,227,095 | | | 43,219,895 | 640,884,032 |
| 257.554 | | | \$1.160.3 | 08 6.1% | | | 1.553 | 20.694.676 | \$10.384.284 | \$44.934.969 | \$55.319.252 | | | | \$5.801.538 | | 309.829.900 | | | 24.925.837 | 373.176.633 |
| 330 | Sensors | \$20 | \$6,6 | 00 0.0% | 0.0070 | 67.8 | 1.9 | 18,587.0 | \$7,154.97 | \$23,710.20 | \$30,865.17 | \$0.3551 | 8 | \$100.00 | \$33,000.00 | 0.9 | 148,696 | \$0.0444 | 2.3 | 22,387.2 | 179,097.6 |
| 1 | lamps removed | \$5 | | \$5 0.0% | 0.0060 | 71.4 | 0.0 | 59.3 | \$31.69 | \$121.96 | \$153.66 | \$0.0843 | 14 | \$25.00 | \$25.00 | 6.1 | 830 | \$0.0060 | 0.0 | 71.4 | 999.6 |
| 1 | lamps removed | \$8 | | \$8 0.0% | 0.0090 | 102.3 | 0.0 | 84.9 | \$47.54 | \$174.70 | \$222.24 | \$0.0883 | 14 | \$37.50 | \$37.50 | 5.9 | 1,189 | \$0.0063 | 0.0 | 102.3 | 1,431.8 |
| 3 | lamps removed | \$10 | \$ | 30 0.0% | 0.0110 | 133.2 | 0.0 | 331.6 | \$174.32 | \$682.33 | \$856.65 | \$0.0905 | 14 | \$50.00 | \$150.00 | 5.7 | 4,643 | \$0.0065 | 0.0 | 399.5 | 5,592.3 |
| 1 | lamps removed | \$15 | ş | 15 0.0% | 0.0250 | 297.2 | 0.0 | 246.7 | \$132.06 | \$507.64 | \$639.69 | \$0.0608 | 14 | \$75.00 | \$75.00 | 8.5 | 3,454 | \$0.0043 | 0.0 | 297.2 | 4,160.5 |
| 0 | lamps | \$3 | | \$0 0.0% | 0.0060 | 71.8 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | \$0.0000 | 14 | \$15.00 | \$0.00 | 0.0 | 0 | \$0.0000 | 0.0 | 0.0 | 0.0 |
| 0 | lamps | \$4 | | \$0 0.0% | 0.0060 | 71.8 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | \$0.0000 | 14 | \$20.00 | \$0.00 | 0.0 | 0 | \$0.0000 | 0.0 | 0.0 | 0.0 |
| 138 | lamps | \$2 | 62.7 | \$0 0.0% | 0.0010 | 11.6 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | \$0.0000 | 14 | \$10.00 | \$0.00 | 0.0 | 494 202 | \$0.0000 | 0.0 | 0.0 | 0.0 |
| 138 | lamps | \$20 | \$2,7 | 25 0.0% | 0.0240 | 201.7 | 2.7 | 32,280.2 | \$16,401.90 | \$70,213.52 CCE 994.67 | \$66,073.42 | \$0.0655 | 15 | \$100.00 | \$15,800.00 | 0.4 | 464,205 | \$0.0037 | 3.3 | 30,000.1 | 565,201.6 |
| 69 | lamps | 525 | \$1,/. \$2.4 | 15 0.0% | 0.0440 | 526.7 | 2.5 | 50,290.1 | \$10,923.41 | \$05,664.07 | \$62,808.08 | \$0.0569 | 15 | \$125.00 | \$6,625.00 | 9.6 | 454,551 | \$0.0038 | 3.0 | 50,465.1 | 547,245.9 |
| 69 | lamps | \$45 | \$2,4 | 05 0.0% | 0.0780 | 1 350.8 | 4.5 | 77 383 6 | \$43,462,39 | \$168 319 06 | \$211 781 45 | \$0.0401 | 15 | \$225.00 | \$15,525,00 | 13.6 | 1 160 754 | \$0.0030 | 7.8 | 93 205 2 | 1 398 078 0 |
| 138 | lamps | \$20 | \$2.7 | 60 0.0% | 0.0550 | 319.7 | 6.3 | 36,634,1 | \$42,308,52 | \$79,683,65 | \$121,992,17 | \$0.0753 | 15 | \$100.00 | \$13,800.00 | 8.8 | 549.511 | \$0.0050 | 7.6 | 44 124 1 | 661 861 8 |
| 69 | lamps | \$25 | \$1.7 | 25 0.0% | 0.1030 | 600.1 | 5.9 | 34,375,8 | \$39,616,16 | \$74,771,64 | \$114,387,80 | \$0.0502 | 15 | \$125.00 | \$8,625,00 | 13.3 | 515.637 | \$0.0033 | 7.1 | 41.404.1 | 621.062.1 |
| 69 | lamps | \$35 | \$2.4 | 15 0.0% | 0.1810 | 1.055.6 | 10.4 | 60.471.3 | \$69,616,75 | \$131.532.60 | \$201.149.35 | \$0.0399 | 15 | \$175.00 | \$12.075.00 | 16.7 | 907.069 | \$0.0027 | 12.5 | 72.835.0 | 1.092.525.3 |
| 69 | lamps | \$45 | \$3,1 | 05 0.0% | 0.2630 | 1,533.0 | 15.1 | 87,821.4 | \$101,155.83 | \$191,022.44 | \$292,178.27 | \$0.0354 | 15 | \$225.00 | \$15,525.00 | 18.8 | 1,317,320 | \$0.0024 | 18.1 | 105,777.0 | 1,586,655.0 |
| 450 | lamps | \$15 | \$6,7 | 50 0.0% | 0.0350 | 306.6 | 13.1 | 114,549.6 | \$87,794.36 | \$249,159.71 | \$336,954.07 | \$0.0589 | 15 | \$75.00 | \$33,750.00 | 10.0 | 1,718,244 | \$0.0039 | 15.8 | 137,970.0 | 2,069,550.0 |
| 225 | lamps | \$3 | \$6 | 75 0.0% | 0.0030 | 36.7 | 0.6 | 6,848.3 | \$3,762.62 | \$14,895.95 | \$18,658.56 | \$0.0986 | 15 | \$15.00 | \$3,375.00 | 5.5 | 102,725 | \$0.0066 | 0.7 | 8,248.5 | 123,727.5 |
| 90,000 | lamps | \$4 | \$360,0 | 00 1.9% | 0.0040 | 52.1 | 298.9 | 3,893,042.3 | \$2,006,728.32 | \$8,467,854.36 | \$10,474,582.69 | \$0.0925 | 15 | \$20.00 | \$1,800,000.00 | 5.8 | 58,395,634 | \$0.0062 | 360.0 | 4,689,000.0 | 70,335,000.0 |
| 75 | lamps | \$3 | \$2 | 25 0.0% | 0.0040 | 44.4 | 0.2 | 2,763.5 | \$1,672.27 | \$6,010.93 | \$7,683.20 | \$0.0814 | 15 | \$15.00 | \$1,125.00 | 6.8 | 41,452 | \$0.0054 | 0.3 | 3,328.5 | 49,927.5 |
| 30,000 | lamps | \$4 | \$120,0 | 00 0.6% | 0.0050 | 61.8 | 124.5 | 1,538,038.1 | \$836,136.80 | \$3,345,425.51 | \$4,181,562.31 | \$0.0780 | 15 | \$20.00 | \$600,000.00 | 7.0 | 23,070,572 | \$0.0052 | 150.0 | 1,852,500.0 | 27,787,500.0 |
| 68 | lamps | \$5 | \$3 | 40 0.0% | 0.0040 | 44.4 | 0.2 | 2,505.6 | \$1,516.19 | \$5,449.91 | \$6,966.11 | \$0.1357 | 15 | \$25.00 | \$1,700.00 | 4.1 | 37,583 | \$0.0090 | 0.3 | 3,017.8 | 45,267.6 |
| 27,000 | lamps | \$8 | \$216,0 | 00 1.1% | 0.0050 | 61.8 | 112.1 | 1,384,234.3 | \$752,523.12 | \$3,010,882.96 | \$3,763,406.08 | \$0.1560 | 15 | \$40.00 | \$1,080,000.00 | 3.5 | 20,763,515 | \$0.0104 | 135.0 | 1,667,250.0 | 25,008,750.0 |
| 9,500 | lamps | \$4 | \$38,0 | 00 0.2% | 0.0050 | 75.5 | 39.4 | 595,812.3 | \$264,776.65 | \$1,295,966.37 | \$1,560,743.03 | \$0.0638 | 15 | \$20.00 | \$190,000.00 | 8.2 | 8,937,185 | \$0.0043 | 47.5 | 717,630.0 | 10,764,450.0 |
| 42,750 | lamps | 52 | \$64,1 | 25 0.3% | 0.0050 | /5.5 | 1/7.5 | 2,681,155.4 | \$1,191,494.94 | 55,831,848.68 | \$7,023,343.63 | \$0.0239 | 15 | \$7.50 | \$320,625.00 | 21.9 | 40,217,331 | \$0.0016 | 213.8 | 3,229,335.0 | 48,440,025.0 |
| 11,0/5 | lamps | 20 | \$39,5 692 1 | 75 0.3% | 0.0130 | 205.7 | 147.9 | 2,028,139.9 | \$992,912.45 | \$4,411,458.21 \$5 704 749 77 | \$5,404,570.67 | \$0.0295 | 15 | \$25.00 | \$290,875.00 | 10.2 | 20.061.494 | \$0.0020 | 1/0.1 | 2,442,600.5 | 30,042,093.6 |
| 19,020 | lamps | \$5 | \$95.0 | 00 0.5% | 0.0140 | 265.9 | 299.7 | 4 194 506 0 | \$2,012,302,57 | \$9 123 575 82 | \$1,052,154.38 | \$0.0312 | 15 | \$25.00 | \$475,020,00 | 23.4 | 62 917 590 | \$0.0021 | 361.0 | 5,052,100,0 | 46,131,608.8 |
| 4,750 | lamps | \$5 | \$23.7 | 50 0.1% | 0.0150 | 212.6 | 59.2 | 838 428 0 | \$397 164 98 | \$1,823,685,80 | \$2 220 850 78 | \$0.0283 | 15 | \$25.00 | \$118,750.00 | 18.7 | 12 576 419 | \$0.0019 | 71.3 | 1,009,850,0 | 15,147,750.0 |
| 95 | lamps | \$25 | \$2.3 | 75 0.0% | 0.0270 | 155.3 | 2.1 | 12.250.7 | \$4,920,32 | \$10.183.29 | \$15,103,61 | \$0.1939 | 5 | \$125.00 | \$11.875.00 | 1.3 | 61.253 | \$0.0388 | 2.6 | 14.755.4 | 73,777.0 |
| 95 | lamps | \$50 | \$4.7 | 50 0.0% | 0.0330 | 194.2 | 2.6 | 15.313.3 | \$6.013.73 | \$12,729,11 | \$18,742,84 | \$0.3102 | 5 | \$250.00 | \$23,750.00 | 0.8 | 76.567 | \$0.0620 | 3.1 | 18.444.3 | 92.221.3 |
| 95 | lamps | \$50 | \$4,7 | 50 0.0% | 0.0400 | 233.0 | 3.2 | 18,376.8 | \$7,289.37 | \$15,275.59 | \$22,564.95 | \$0.2585 | 5 | \$250.00 | \$23,750.00 | 1.0 | 91,884 | \$0.0517 | 3.8 | 22,134.1 | 110,670.3 |
| 375 | lamps | \$20 | \$7,5 | 00 0.0% | 0.0090 | 102.7 | 2.8 | 31,962.5 | \$18,813.08 | \$69,522.55 | \$88,335.63 | \$0.2346 | 15 | \$100.00 | \$37,500.00 | 2.4 | 479,438 | \$0.0156 | 3.4 | 38,497.5 | 577,462.5 |
| 375 | lamps | \$20 | \$7,5 | 00 0.0% | 0.0010 | 9.3 | 0.3 | 2,883.0 | \$2,090.34 | \$6,270.98 | \$8,361.32 | \$2.6014 | 15 | \$100.00 | \$37,500.00 | 0.2 | 43,246 | \$0.1734 | 0.4 | 3,472.5 | 52,087.5 |
| 375 | lamps | \$50 | \$18,7 | 50 0.1% | 0.0220 | 267.1 | 6.8 | 83,150.6 | \$45,987.52 | \$180,862.91 | \$226,850.44 | \$0.2255 | 15 | \$250.00 | \$93,750.00 | 2.4 | 1,247,259 | \$0.0150 | 8.3 | 100,151.3 | 1,502,268.8 |
| 350 | lamps | \$10 | \$3,5 | 0.0% | 0.0070 | 79.1 | 2.0 | 22,991.3 | \$13,656.90 | \$50,008.92 | \$63,665.82 | \$0.1522 | 15 | \$50.00 | \$17,500.00 | 3.6 | 344,869 | \$0.0101 | 2.5 | 27,692.0 | 415,380.0 |
| 1,050 | lamps | \$4 | \$4,2 | 0.0% | 0.0040 | 52.1 | 3.5 | 45,418.8 | \$23,411.83 | \$98,791.63 | \$122,203.46 | \$0.0925 | 15 | \$20.00 | \$21,000.00 | 5.8 | 681,282 | \$0.0062 | 4.2 | 54,705.0 | 820,575.0 |
| 350 | lamps | \$10 | \$3,5 | 0.0% | 0.0070 | 86.8 | 2.0 | 25,234.6 | \$13,656.90 | \$54,888.46 | \$68,545.36 | \$0.1387 | 15 | \$50.00 | \$17,500.00 | 3.9 | 378,519 | \$0.0092 | 2.5 | 30,394.0 | 455,910.0 |
| 350 | lamps | \$4 | \$1,4 | 00 0.0% | 0.0050 | 61.8 | 1.5 | 17,943.8 | \$9,754.93 | \$39,029.96 | \$48,784.89 | \$0.0780 | 15 | \$20.00 | \$7,000.00 | 7.0 | 269,157 | \$0.0052 | 1.8 | 21,612.5 | 324,187.5 |
| 350 | lamps | \$15 | \$5,2 | 50 0.0% | 0.0070 | 86.8 | 2.0 | 25,234.6 | \$13,656.90 | \$54,888.46 | \$68,545.36 | \$0.2080 | 15 | \$75.00 | \$26,250.00 | 2.6 | 378,519 | \$0.0139 | 2.5 | 30,394.0 | 455,910.0 |
| 350 | lamps | 58 | 52.8 | UUI U.U% | 0.0050 | 61.8 | 1.5 | 17.943.8 | 59.754.93 | 539.029.96 | 548.784.89 | 50.1560 | 15 | \$40.00 | 514.000.00 | 3.5 | 269.157 | 50.0104 | 1.8 | 21.612.5 | 324.187.5 |

| | Quantity | Unit | Average Incentive | Incentive % Budget of | Demand Savings per Unit | Energy Savings per Unit | Program-Level 1st Year Demand Savings | Program-Level 1st Year Energy Savings | Demand Derived | Energy Derived | Utility Avoided Cost Total Resource Benefit | Program-Level 1st Year | Measure Life | Average TRC | Total Resource Cost | TRB / TRC Ratio | Program-Level Lifetime Energy Savings | Program-Level Lifetime | Customer-Level 1st Year Demand Savings | Customer-Level 1st Year Energy Savings | Customer-Level Lifetime Energy Savings |
|--|----------|---------------|----------------------|--------------------------|----------------------------|----------------------------|---|---|------------------------------|------------------------------|--|---------------------------|-----------------|----------------|------------------------|--------------------|---|---------------------------|--|--|--|
| irect Incentives | | | per Unit | per measure Budget | (W) | (KW/N) | (kW) | (kWh) | IND | IND | (110) | \$/KW/N | | per unit | (IRC) | | (kWh) | \$/KWh | (kW) | (kWh) | (kWh) |
| | | | | | | | | | | | | | | | | | | | | | |
| DEEM | | | | 62 A27 2EA 10 20/ | | | 4 4 2 0 | 25 002 027 | 628 080 402 | 677 151 669 | \$106 141 161 | | | | 617 106 260 | | E22 227 00E | | | 42 210 805 | 640 884 021 |
| | | | | <i>33,437,234</i> 18.2/0 | | | 4,423 | 33,092,027 | 320,303,4 <u>3</u> 2 | \$77,151,008 | \$100,141,101 | | | | \$17,100,200 | | 332,227,033 | | | 43,219,895 | 040,884,032 |
| Milostream Ligh Efficiency Lighting | 257 55 | | | \$1 160 200 E 1W | | | 1 552 | 20 604 676 | \$10 294 294 | \$44.024.050 | ¢55 210 252 | | | | CE 901 E29 | | 200 920 000 | | | 24 025 927 | 272 176 621 |
| Orcumancy Controls Sensors & Timers: Controls Cercumancy Sensor | 330 | Sensors | \$20 | \$6,600 0.0% | 0.0070 | 67.8 | 1.553 | 18 587 0 | \$7 154 97 | \$23,710,20 | \$30,865,17 | \$0.3551 | 8 | \$100.00 | \$33,000,00 | 0.9 | 148 696 | \$0.0444 | 2.3 | 24,525,637 | 179.097 (|
| Fluorescent: Delamoing with Reflectors [2 ft Jann] | | lamps removed | \$5 | \$5 0.0% | 0.0060 | 71.4 | 0.0 | 59.3 | \$31.69 | \$121.96 | \$153.66 | \$0.0843 | 14 | \$25.00 | \$25.00 | 6.1 | 830 | \$0.0060 | 0.0 | 71.4 | 999 / |
| Fluorescent: Delamoing with Reflectors [3 ft Jamp] | | lamps removed | \$8 | \$8 0.0% | 0.0090 | 102.3 | 0.0 | 84.9 | \$47.54 | \$174.70 | \$222.24 | \$0.0883 | 14 | \$37.50 | \$37.50 | 5.9 | 1.189 | \$0.0063 | 0.0 | 102.3 | 1.431.0 |
| Fluorescent: Delamping with Reflectors [4 ft. Lamp] | | lamps removed | \$10 | \$30 0.0% | 0.0110 | 133.2 | 0.0 | 331.6 | \$174.32 | \$682.33 | \$856.65 | \$0.0905 | 14 | \$50.00 | \$150.00 | 5.7 | 4,643 | \$0.0065 | 0.0 | 399.5 | 5.592. |
| Fluorescent: Delamping with Reflectors [8 ft. Lamp] | | lamps removed | \$15 | \$15 0.0% | 0.0250 | 297.2 | 0.0 | 246.7 | \$132.06 | \$507.64 | \$639.69 | \$0.0608 | 14 | \$75.00 | \$75.00 | 8.5 | 3,454 | \$0.0043 | 0.0 | 297.2 | 4,160. |
| Fluorescent: T12 to Standard T8 with electronic ballast [2 ft. Lamp] | (|) lamps | \$3 | \$0 0.0% | 0.0060 | 71.8 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | \$0.0000 | 14 | \$15.00 | \$0.00 | 0.0 | 0 | \$0.0000 | 0.0 | 0.0 | 0.0 |
| Fluorescent: T12 to Standard T8 with electronic ballast [3 ft. Lamp] | (|) lamps | \$4 | \$0 0.0% | 0.0060 | 71.8 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | \$0.0000 | 14 | \$20.00 | \$0.00 | 0.0 | 0 | \$0.0000 | 0.0 | 0.0 | 0./ |
| Fluorescent: Blended T12/T8 to LWT8 [4 ft. Lamp] | (|) lamps | \$2 | \$0 0.0% | 0.0010 | 11.6 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | \$0.0000 | 14 | \$10.00 | \$0.00 | 0.0 | 0 | \$0.0000 | 0.0 | 0.0 | 0.0 |
| LED: Corn Cob [<29W] | 13 | 8 lamps | \$20 | \$2,760 0.0% | 0.0240 | 281.7 | 2.7 | 32,280.2 | \$18,461.90 | \$70,213.52 | \$88,675.42 | \$0.0855 | 15 | \$100.00 | \$13,800.00 | 6.4 | 484,203 | \$0.0057 | 3.3 | 38,880.1 | 583,201.8 |
| LED: Corn Cob [30-49W] | 65 |) lamps | \$25 | \$1,725 0.0% | 0.0440 | 528.7 | 2.5 | 30,290.1 | \$16,923.41 | \$65,884.67 | \$82,808.08 | \$0.0569 | 15 | \$125.00 | \$8,625.00 | 9.6 | 454,351 | \$0.0038 | 3.0 | 36,483.1 | 547,245.9 |
| LED: Corn Cob [50-79W] | 65 |) lamps | \$35 | \$2,415 0.0% | 0.0780 | 930.1 | 4.5 | 53,284.0 | \$30,000.59 | \$115,899.41 | \$145,900.00 | \$0.0453 | 15 | \$175.00 | \$12,075.00 | 12.1 | 799,260 | \$0.0030 | 5.4 | 64,178.3 | 962,674.7 |
| LED: Corn Cob [80-125W] | 65 | amps lamps | \$45 | \$3,105 0.0% | 0.1130 | 1,350.8 | 6.5 | 77,383.6 | \$43,462.39 | \$168,319.06 | \$211,781.45 | \$0.0401 | 15 | \$225.00 | \$15,525.00 | 13.6 | 1,160,754 | \$0.0027 | 7.8 | 93,205.2 | 1,398,078.0 |
| LED: Corn Cob (Exterior) [<29W] | 13 | 8 lamps | \$20 | \$2,760 0.0% | 0.0550 | 319.7 | 6.3 | 36,634.1 | \$42,308.52 | \$79,683.65 | \$121,992.17 | \$0.0753 | 15 | \$100.00 | \$13,800.00 | 8.8 | 549,511 | \$0.0050 | 7.6 | 44,124.1 | 661,861.8 |
| LED: Corn Cob (Exterior) [30-49W] | 65 | amps lamps | \$25 | \$1,725 0.0% | 0.1030 | 600.1 | 5.9 | 34,375.8 | \$39,616.16 | \$74,771.64 | \$114,387.80 | \$0.0502 | 15 | \$125.00 | \$8,625.00 | 13.3 | 515,637 | \$0.0033 | 7.1 | 41,404.1 | 621,062.1 |
| LED: Corn Cob (Exterior) [50-79W] | 65 |) lamps | \$35 | \$2,415 0.0% | 0.1810 | 1,055.6 | 10.4 | 60,471.3 | \$69,616.75 | \$131,532.60 | \$201,149.35 | \$0.0399 | 15 | \$175.00 | \$12,075.00 | 16.7 | 907,069 | \$0.0027 | 12.5 | 72,835.0 | 1,092,525.3 |
| LED: Corn Cob (Exterior) [80-125W] | 65 | amps | \$45 | \$3,105 0.0% | 0.2630 | 1,533.0 | 15.1 | 87,821.4 | \$101,155.83 | \$191,022.44 | \$292,178.27 | \$0.0354 | 15 | \$225.00 | \$15,525.00 | 18.8 | 1,317,320 | \$0.0024 | 18.1 | 105,777.0 | 1,586,655.0 |
| LED: Exit Sign [New LED Fixture] | 450 |) lamps | \$15 | \$6,750 0.0% | 0.0350 | 306.6 | 13.1 | 114,549.6 | \$87,794.36 | \$249,159.71 | \$336,954.07 | \$0.0589 | 15 | \$75.00 | \$33,750.00 | 10.0 | 1,718,244 | \$0.0039 | 15.8 | 137,970.0 | 2,069,550.0 |
| LED: Linear Type A [2 ft. Lamp] | 225 | amps | \$3 | \$675 0.0% | 0.0030 | 36.7 | 0.6 | 6,848.3 | \$3,762.62 | \$14,895.95 | \$18,658.56 | \$0.0986 | 15 | \$15.00 | \$3,375.00 | 5.5 | 102,725 | \$0.0066 | 0.7 | 8,248.5 | 123,727.5 |
| LED: Linear lype A (4 ft. Lamp) | 90,000 | iamps | \$4 | \$360,000 1.9% | 0.0040 | 52.1 | 298.9 | 3,893,042.3 | \$2,006,728.32 | \$8,467,854.36 | \$10,474,582.69 | \$0.0925 | 15 | \$20.00 | \$1,800,000.00 | 5.8 | 58,395,634 | \$0.0062 \$0.0054 | 360.0 | 4,689,000.0 | 70,335,000.0 |
| LED. Linear type B [21]. Lamp] | 20.000 | anips | 22 | \$225 0.0% | 0.0040 | 44.4 | 124.5 | 2,703.5 | \$1,072.27 | 56,010.95 | \$7,083.20 | 50.0814 | 15 | \$15.00 | \$1,125.00 | 0.0 | 41,452 | \$0.0054 | 0.3 | 3,326.5 | 49,927.3 |
| LED. Linear type 6 [41, Lamp] | 50,000 | anips lamor | 94 65 | \$120,000 0.8% | 0.0050 | 01.0 | 124.5 | 1,556,056.1 | \$630,130.00 | \$5,545,425.51 \$5,440.01 | \$4,181,502.51 | \$0.0780 | 15 | \$20.00 | \$600,000.00 | 7.0 | 23,070,572 | \$0,0052 | 150.0 | 1,652,500.0 | 27,787,500.0 |
| | 27.00 |) lamps | 00 00 | \$340 0.0% | 0.0040 | 44.4 61.9 | 112.1 | 1 204 224 2 | \$757 572 17 | \$3,443.31 | \$2,762,406,09 | \$0.1557 | 15 | \$25.00 | \$1,700.00 | 4.1 | 20 762 515 | \$0.0050 | 125.0 | 1 667 250 0 | 45,207.0 |
| LED. Enter Type C [41: Eating] | 27,000 |) lamps | 20 ¢ A | \$28,000 0.2% | 0.0050 | 75 5 | 20.4 | 1,304,234.3 E0E 913 2 | \$752,525.12 \$764 776 65 | \$1,205,066,27 | \$1,50,742,02 | \$0.1500 | 15 | \$40.00 | \$1,080,000.00 | 3.5 | 20,703,515 | \$0.0042 | 133.0 | 717 620 0 | 10 764 450 (|
| IED: Omni Directional (Tribuc) | 42 750 |) lamps | \$2 | \$64,125 0.3% | 0.0050 | 75.5 | 177.5 | 2 681 155 4 | \$1 191 494 94 | \$5 831 848 68 | \$7,023,343,63 | \$0.0239 | 15 | \$7.50 | \$320,625,00 | 21.9 | 40 217 331 | \$0.0045 | 213.8 | 3 229 335 0 | 48 440 025 (|
| IED: MR16 | 11.87 | lamps | \$5 | \$59.375 0.3% | 0.0150 | 205.7 | 147.9 | 2,001,139.9 | \$992.912.45 | \$4 411 458 21 | \$5 404 370 67 | \$0.0293 | 15 | \$25.00 | \$296,825.00 | 18.2 | 30 422 098 | \$0.0020 | 178.1 | 2 442 806 3 | 36 642 093 (|
| LED: PAR20 | 16.62 | amps | \$5 | \$83,125 0.4% | 0.0140 | 193.0 | 193.2 | 2.664.098.9 | \$1.297.405.60 | \$5,794,748,77 | \$7.092.154.38 | \$0.0312 | 15 | \$25.00 | \$415.625.00 | 17.1 | 39,961,484 | \$0.0021 | 232.8 | 3.208.791.3 | 48.131.868./ |
| LED: PAR30 | 19.00 |) lamps | \$5 | \$95,000 0.5% | 0.0190 | 265.9 | 299.7 | 4,194,506.0 | \$2.012.302.57 | \$9.123.575.82 | \$11.135.878.39 | \$0.0226 | 15 | \$25.00 | \$475,000,00 | 23.4 | 62.917.590 | \$0.0015 | 361.0 | 5.052.100.0 | 75,781,500,0 |
| LED: PAR38 | 4,750 |) lamps | \$5 | \$23,750 0.1% | 0.0150 | 212.6 | 59.2 | 838,428.0 | \$397,164.98 | \$1,823,685.80 | \$2,220,850.78 | \$0.0283 | 15 | \$25.00 | \$118,750.00 | 18.7 | 12,576,419 | \$0.0019 | 71.3 | 1,009,850.0 | 15,147,750.0 |
| LED: Refrigerated Case Lighting [4 ft. retrofit kit] | 95 | i lamps | \$25 | \$2,375 0.0% | 0.0270 | 155.3 | 2.1 | 12,250.7 | \$4,920.32 | \$10,183.29 | \$15,103.61 | \$0.1939 | 5 | \$125.00 | \$11,875.00 | 1.3 | 61,253 | \$0.0388 | 2.6 | 14,755.4 | 73,777.0 |
| LED: Refrigerated Case Lighting [5 ft. retrofit kit] | 95 | amps | \$50 | \$4,750 0.0% | 0.0330 | 194.2 | 2.6 | 15,313.3 | \$6,013.73 | \$12,729.11 | \$18,742.84 | \$0.3102 | 5 | \$250.00 | \$23,750.00 | 0.8 | 76,567 | \$0.0620 | 3.1 | 18,444.3 | 92,221.5 |
| LED: Refrigerated Case Lighting [6 ft. retrofit kit] | 95 | i lamps | \$50 | \$4,750 0.0% | 0.0400 | 233.0 | 3.2 | 18,376.8 | \$7,289.37 | \$15,275.59 | \$22,564.95 | \$0.2585 | 5 | \$250.00 | \$23,750.00 | 1.0 | 91,884 | \$0.0517 | 3.8 | 22,134.1 | 110,670.7 |
| LED: Troffer [1 ft. x 4 ft.] | 37 | iamps | \$20 | \$7,500 0.0% | 0.0090 | 102.7 | 2.8 | 31,962.5 | \$18,813.08 | \$69,522.55 | \$88,335.63 | \$0.2346 | 15 | \$100.00 | \$37,500.00 | 2.4 | 479,438 | \$0.0156 | 3.4 | 38,497.5 | 577,462.5 |
| LED: Troffer [2 ft. x 2 ft.] | 37 | amps | \$20 | \$7,500 0.0% | 0.0010 | 9.3 | 0.3 | 2,883.0 | \$2,090.34 | \$6,270.98 | \$8,361.32 | \$2.6014 | 15 | \$100.00 | \$37,500.00 | 0.2 | 43,246 | \$0.1734 | 0.4 | 3,472.5 | 52,087.5 |
| LED: Troffer [2 ft. x 4 ft.] | 37 | iamps | \$50 | \$18,750 0.1% | 0.0220 | 267.1 | 6.8 | 83,150.6 | \$45,987.52 | \$180,862.91 | \$226,850.44 | \$0.2255 | 15 | \$250.00 | \$93,750.00 | 2.4 | 1,247,259 | \$0.0150 | 8.3 | 100,151.3 | 1,502,268.8 |
| LED: U-bend Type A [2 ft. x 2 ft. Conversion Kit | 350 |) lamps | \$10 | \$3,500 0.0% | 0.0070 | 79.1 | 2.0 | 22,991.3 | \$13,656.90 | \$50,008.92 | \$63,665.82 | \$0.1522 | 15 | \$50.00 | \$17,500.00 | 3.6 | 344,869 | \$0.0101 | 2.5 | 27,692.0 | 415,380.0 |
| LED: U-bend Type A [4 ft. Lamp Equivalent | 1,050 |) lamps | \$4 | \$4,200 0.0% | 0.0040 | 52.1 | 3.5 | 45,418.8 | \$23,411.83 | \$98,791.63 | \$122,203.46 | \$0.0925 | 15 | \$20.00 | \$21,000.00 | 5.8 | 681,282 | \$0.0062 | 4.2 | 54,705.0 | 820,575.0 |
| LED: U-bend Type B [2 ft. x 2 ft. Conversion Kit | 350 |) lamps | \$10 | \$3,500 0.0% | 0.0070 | 86.8 | 2.0 | 25,234.6 | \$13,656.90 | \$54,888.46 | \$68,545.36 | \$0.1387 | 15 | \$50.00 | \$17,500.00 | 3.9 | 378,519 | \$0.0092 | 2.5 | 30,394.0 | 455,910.0 |
| LED: U-bend Type B [4 ft. Lamp Equivalent] | 350 |) lamps | \$4 | \$1,400 0.0% | 0.0050 | 61.8 | 1.5 | 17,943.8 | \$9,754.93 | \$39,029.96 | \$48,784.89 | \$0.0780 | 15 | \$20.00 | \$7,000.00 | 7.0 | 269,157 | \$0.0052 | 1.8 | 21,612.5 | 324,187.5 |
| LED: U-bend Type C [2 ft. x 2 ft. Conversion Kit | 350 |) lamps | \$15 | \$5,250 0.0% | 0.0070 | 86.8 | 2.0 | 25,234.6 | \$13,656.90 | \$54,888.46 | \$68,545.36 | \$0.2080 | 15 | \$75.00 | \$26,250.00 | 2.6 | 378,519 | \$0.0139 | 2.5 | 30,394.0 | 455,910.0 |
| LED: U-bend Type C 4 ft. Lamp Equivalent | 350 |) lamps | \$8 | \$2,800 0.0% | 0.0050 | 61.8 | 1.5 | 17,943.8 | \$9,754.93 | \$39,029.96 | \$48,784.89 | \$0.1560 | 15 | \$40.00 | \$14,000.00 | 3.5 | 269,157 | \$0.0104 | 1.8 | 21,612.5 | 324,187.5 |

| | | Quantity | Unit | Average Incentive per Unit | Incentive Budget per Measure | % of Budget | Demand Savings per Unit (kW) | Energy Savings per Unit (kWh) | Program-Level 1st Year Demand Savings | Program-Level 1st Year Energy Savings | Demand Derived TRB | Energy Derived TRB | Utility Avoided Cost Total Resource Benefit (TRB) | Program-Level 1st Year \$/kWh | Measure Life | Average TRC per Unit | Total Resource Cost (TRC) | TRB / TRC Ratio | Program-Level Lifetime Energy Savings | Program-Level Lifetime \$/kWh | Customer-Level 1st Year Demand Savings | Customer-Level 1st Year Energy Savings | Customer-Level Lifetime Energy Savings |
|----------|--|-----------------|--|----------------------------------|------------------------------------|-------------------|------------------------------------|-------------------------------------|---|---|--------------------------------|--------------------------------|---|-------------------------------------|-----------------|----------------------------|---------------------------------|--------------------|---|-------------------------------------|--|--|--|
| rect inc | centives | | | | | - | | | (kW) | (kWh) | | | | | | | | | (kWh) | | (kW) | (kWh) | (kWh) |
| COMME | RCIAL RESOURCE ACQUISITION | | | | | | | | | | | | | | | | | | | | | | |
| BEE | M (Continued) | | | | | | | | | | | | | | | | | | | | | | |
| Trade | e Ally Provided High Efficiency Lighting | 113.579 | 9 | | \$667.030 | 3.5% | | | 568 | 6.733.347 | \$3,796,989 | \$14.602.438 | \$18,399,428 | | | | \$3.335.150 | | 100.658.840 | | | 8.110.024 | 121.239.194 |
| | Occupancy Controls, Sensors & Timers: Controls: Occupancy Sensor | 670 |) Sensors | \$20 | \$13,400 | 0.1% | 0.0070 | 67.8 | 3.9 | 37,737.2 | \$14,526.75 | \$48,138.89 | \$62,665.64 | \$0.3551 | 8 | \$100.00 | \$67,000.00 | 0.9 | 301,897.5 | \$0.0444 | 4.7 | 45,452.8 | 363,622.4 |
| | Linear Fluorescent: Fluorescent: Delamping with Reflectors [2 ft. Lamp] Linear Fluorescent: Fluorescent: Delamping with Reflectors [3 ft. Lamp] | 19 | lamps removed lamps removed | \$5 \$8 | \$95 | 0.0% | 0.0060 | /1.4 102.3 | 0.1 | 1,126.3 1,613.3 | \$602.18 \$903.27 | \$2,317.31 \$3,319.21 | \$2,919.50 \$4,222.48 | \$0.0843 \$0.0883 | 14 | \$25.00 \$37.50 | \$475.00 \$712.50 | 6.1 5.9 | 15,768.4 22,586.0 | \$0.0060 | 0.1 | 1,356.6 1,943.1 | 18,992.4 27,203.8 |
| | Fluorescent: Delamping with Reflectors [4 ft. Lamp] | 47 | 7 lamps removed | \$10 | \$470 | 0.0% | 0.0110 | 133.2 | 0.4 | 5,195.7 | \$2,730.95 | \$10,689.86 | \$13,420.81 | \$0.0905 | 14 | \$50.00 | \$2,350.00 | 5.7 | 72,740.4 | \$0.0065 | 0.5 | 6,258.1 | 87,612.7 |
| | Fluorescent: Delamping with Reflectors [8 ft. Lamp] Fluorescent: Delamping without Reflectors [2 ft. Lamp] | 19 | lamps removed lamps removed | \$15 | \$285 | 0.0% | 0.0250 | 297.2 | 0.4 | 4,687.9 | \$2,509.09 \$633.88 | \$9,645.09 \$2.439.28 | \$12,154.18 \$3.073.15 | \$0.0608 | 14 | \$75.00 \$12.50 | \$1,425.00 \$250.00 | 8.5 | 65,631.2 16.598.4 | \$0.0043 | 0.5 | 5,646.4 | 79,049.9 19.992.0 |
| | Fluorescent: Delamping without Reflectors [3 ft. Lamp] | 20 | D lamps removed | \$4 | \$75 | 0.0% | 0.0090 | 102.3 | 0.1 | 1,698.2 | \$950.81 | \$3,493.91 | \$4,444.72 | \$0.0442 | 14 | \$18.75 | \$375.00 | 11.9 | 23,774.7 | \$0.0032 | 0.2 | 2,045.4 | 28,635.6 |
| | Fluorescent: Delamping without Reflectors [4 ft. Lamp] Fluorescent: Delamping without Reflectors [8 ft. Lamp] | 100 |) lamps removed) lamps removed | \$5 \$7.50 | \$500 \$150 | 0.0% | 0.0110 0.0250 | 133.2 297.2 | 0.9 | 11,054.8 4,934.7 | \$5,810.54 \$2.641.15 | \$22,744.38 \$10.152.72 | \$28,554.92 \$12,793.87 | \$0.0452 \$0.0304 | 14 14 | \$25.00 \$37.50 | \$2,500.00 \$750.00 | 11.4 | 154,766.9 69.085.4 | \$0.0032 \$0.0022 | 1.1 | 13,315.0 5.943.6 | 186,410.0 83,210.4 |
| | Fluorescent: T12 to Standard T8 with electronic ballast [2 ft. Lamp] | 100 | D lamps | \$3 | \$300 | 0.0% | 0.0060 | 71.8 | 0.5 | 5,960.4 | \$3,169.38 | \$12,263.00 | \$15,432.39 | \$0.0503 | 14 | \$15.00 | \$1,500.00 | 10.3 | 83,445.1 | \$0.0036 | 0.6 | 7,179.0 | 100,506.0 |
| | Fluorescent: I12 to Standard 18 with electronic ballast [3 ft. Lamp] Fluorescent: Blended T12/T8 to LWT8 [4 ft. Lamp] | 100 | D lamps D lamps | \$4 \$2 | \$400 \$2,000 | 0.0% | 0.0060 | 71.8 | 0.5 | 5,960.4 9,614.3 | \$3,169.38 \$5,282.31 | \$12,263.00 \$19,780.69 | \$15,432.39 \$25,063.00 | \$0.0671 \$0.2080 | 14 | \$20.00 | \$2,000.00 | 2.5 | 83,445.1 134,600.1 | \$0.0048 | 0.6 | 7,179.0 11,580.0 | 100,506.0 162,120.0 |
| | LED: Corn Cob [<29W] | 112 | 2 lamps | \$20 | \$2,240 | 0.0% | 0.0240 | 281.7 | 2.2 | 26,198.4 | \$14,983.57 | \$56,984.89 | \$71,968.46 | \$0.0855 | 15 | \$100.00 | \$11,200.00 | 6.4 | 392,976.6 | \$0.0057 | 2.7 | 31,554.9 | 473,323.2 |
| | LED: Corn Cob [30-49W] LED: Corn Cob [50-79W] | 56 | 5 lamps 5 lamps | \$25 | \$1,400 \$1,960 | 0.0% | 0.0440 | 528.7 | 2.0 | 24,583.2 43,245.0 | \$13,734.94 \$24,348.30 | \$53,471.62 \$94,063.29 | \$67,206.56 \$118,411.59 | \$0.0569 | 15 | \$125.00 \$175.00 | \$7,000.00 \$9,800.00 | 9.6 | 368,748.6 648,675.0 | \$0.0038 | 2.5 | 29,609.4 52,086.7 | 444,141.6 781,300.8 |
| | LED: Corn Cob [80-125W] | 56 | 5 lamps | \$45 | \$2,520 | 0.0% | 0.1130 | 1,350.8 | 5.3 | 62,804.1 | \$35,273.82 | \$136,606.77 | \$171,880.60 | \$0.0401 | 15 | \$225.00 | \$12,600.00 | 13.6 | 942,061.4 | \$0.0027 | 6.3 | 75,644.8 | 1,134,672.0 |
| | LED: Corn Cob (Exterior) [<29W] LED: Corn Cob (Exterior) [30-49W] | 56 | z lamps 5 lamps | \$20 | \$2,240 | 0.0% | 0.0550 | 600.1 | 5.1 | 29,732.0 27,899.2 | \$34,337.35 \$32,152.25 | \$60,684.23 | \$99,008.14 \$92,836.48 | \$0.0753 | 15 | \$100.00 | \$7,000.00 | 8.8 | 445,979.7 418,487.8 | \$0.0033 | 5.8 | 33,603.4 | 537,163.2 |
| | LED: Corn Cob (Exterior) [50-79W] | 56 | 5 lamps | \$35 | \$1,960 | 0.0% | 0.1810 | 1,055.6 | 8.4 | 49,078.1 | \$56,500.55 | \$106,751.09 | \$163,251.64 | \$0.0399 | 15 | \$175.00 | \$9,800.00 | 16.7 | 736,172.0 | \$0.0027 | 10.1 | 59,112.5 | 886,687.2 |
| | LED: Exit Sign [New LED Fixture] | 2,550 | o lamps D lamps | \$15 | \$2,520 | 0.0% | 0.2630 | 306.6 | 74.1 | 649,114.4 | \$497,501.40 | \$1,411,905.01 | \$1,909,406.40 | \$0.0354 \$0.0589 | 15 | \$225.00 | \$12,600.00 | 18.8 | 9,736,715.4 | \$0.0024 | 89.3 | 85,848.0 781,830.0 | 1,287,720.0 |
| | LED: Linear Type A [2 ft. Lamp] | 150 | D lamps | \$3 | \$450 | 0.0% | 0.0030 | 36.7 | 0.4 | 4,565.5 | \$2,508.41 | \$9,930.63 | \$12,439.04 | \$0.0986 | 15 | \$15.00 | \$2,250.00 | 5.5 | 68,483.2 | \$0.0066 | 0.5 | 5,499.0 | 82,485.0 |
| | LED: Linear Type A [4 ft. Lamp] LED: Linear Type B [2 ft. Lamp] | 50,000 | D lamps D lamps | \$4 \$3 | \$240,000 | 0 0.0% | 0.0040 | 44.4 | 199.3 | 2,595,361.5 | \$1,337,818.88 \$1,114.85 | \$5,645,236.24 \$4,007.29 | \$5,122.14 | \$0.0925 | 15 | \$20.00 | \$1,200,000.00 \$750.00 | 5.8 | 38,930,422.5 27,634.9 | \$0.0054 | 0.2 | 3,126,000.0 | 46,890,000.0 |
| | LED: Linear Type B [4 ft. Lamp] | 20,000 | D lamps | \$4 | \$80,000 | 0.4% | 0.0050 | 61.8 | 83.0 | 1,025,358.8 | \$557,424.53 | \$2,230,283.67 | \$2,787,708.21 | \$0.0780 | 15 | \$20.00 | \$400,000.00 | 7.0 | 15,380,381.3 | \$0.0052 | 100.0 | 1,235,000.0 | 18,525,000.0 |
| | LED: Linear Type C [2 ft. Lamp] LED: Linear Type C [4 ft. Lamp] | 45 | 5 lamps D lamps | \$5 \$8 | \$223 | 0.0% | 0.0040 | 44.4 61.8 | 0.1 | 1,639.7 922,822.9 | \$992.22 \$501,682.08 | \$3,566.49 \$2,007,255.31 | \$4,558.70 \$2,508,937.39 | \$0.1357 \$0.1560 | 15 | \$25.00 \$40.00 | \$1,112.50 | 4.1 3.5 | 24,595.0 13,842,343.1 | \$0.0090 | 90.0 | 1,974.9 1,111,500.0 | 29,623.7 16,672,500.0 |
| | LED: Omni-Directional [Pin Base] | 500 | D lamps | \$4 | \$2,000 | 0.0% | 0.0050 | 75.5 | 2.1 | 31,358.5 | \$13,935.61 | \$68,208.76 | \$82,144.37 | \$0.0638 | 15 | \$20.00 | \$10,000.00 | 8.2 | 470,378.1 | \$0.0043 | 2.5 | 37,770.0 | 566,550.0 |
| | LED: Omni-Directional [Screw Base] LED: MR16 | 2,250 | 5 lamps | \$2 \$5 | \$3,375 | 0.0% | 0.0050 | 205.7 | 9.3 | 141,113.4 106,744.2 | \$62,710.26 \$52,258.55 | \$306,939.40 \$232,182.01 | \$369,649.66 \$284,440.56 | \$0.0239 | 15 | \$7.50 \$25.00 | \$16,875.00 \$15,625.00 | 21.9 | 2,116,/01.6 1,601,163.1 | \$0.0016 | 11.3 9.4 | 169,965.0 128,568.8 | 2,549,475.0 1,928,531.3 |
| | LED: PAR20 | 875 | 5 lamps | \$5 | \$4,375 | 0.0% | 0.0140 | 193.0 | 10.2 | 140,215.7 | \$68,284.51 | \$304,986.78 | \$373,271.28 | \$0.0312 | 15 | \$25.00 | \$21,875.00 | 17.1 | 2,103,236.0 | \$0.0021 | 12.3 | 168,883.8 | 2,533,256.3 |
| | LED: PAR30 LED: PAR38 | 1,000 | D lamps | \$5 | \$5,000 \$1,250 | 0.0% | 0.0190 | 265.9 | 15.8 | 220,763.5 44.127.8 | \$105,910.66 \$20,903.42 | \$480,188.20 \$95.983.46 | \$586,098.86 \$116.886.88 | \$0.0226 | 15 | \$25.00 \$25.00 | \$25,000.00 \$6,250.00 | 23.4 | 3,311,452.1 661,916.8 | \$0.0015 \$0.0019 | 19.0 | 265,900.0 53,150.0 | 3,988,500.0 797.250.0 |
| | LED: Refrigerated Case Lighting [4 ft. retrofit kit] | 5 | lamps | \$25 | \$125 | 0.0% | 0.0270 | 155.3 | 0.1 | 644.8 | \$258.96 | \$535.96 | \$794.93 | \$0.1939 | 5 | \$125.00 | \$625.00 | 1.3 | 3,223.9 | \$0.0388 | 0.1 | 776.6 | 3,883.0 |
| | LED: Refrigerated Case Lighting [5 ft. retrofit kit] LED: Refrigerated Case Lighting [6 ft. retrofit kit] | 5 | 5 lamps 5 lamps | \$50 \$50 | \$250 \$250 | 0.0% | 0.0330 0.0400 | 194.2 233.0 | 0.1 | 806.0 967.2 | \$316.51 \$383.65 | \$669.95 \$803.98 | \$986.47 \$1,187.63 | \$0.3102 \$0.2585 | 5 | \$250.00 \$250.00 | \$1,250.00 \$1,250.00 | 0.8 | 4,029.8 4,836.0 | \$0.0620 \$0.0517 | 0.2 | 970.8 1,165.0 | 4,853.8 5,824.8 |
| | LED: Troffer [1 ft. x 4 ft.] | 1,125 | 5 lamps | \$20 | \$22,500 | 0.1% | 0.0090 | 102.7 | 8.4 | 95,887.6 | \$56,439.23 | \$208,567.64 | \$265,006.88 | \$0.2346 | 15 | \$100.00 | \$112,500.00 | 2.4 | 1,438,314.7 | \$0.0156 | 10.1 | 115,492.5 | 1,732,387.5 |
| | LED: Troffer [2 ft. x 2 ft.] LED: Troffer [2 ft. x 4 ft.] | 1,125 | 5 lamps 5 lamps | \$50 | \$22,500 \$56,250 | 0.1% | 0.0010 | 9.3 267.1 | 20.5 | 249,451.7 | \$6,271.03 \$137,962.57 | \$18,812.94 \$542,588.74 | \$25,083.97 \$680,551.31 | \$2.6014 \$0.2255 | 15 | \$250.00 | \$112,500.00 \$281,250.00 | 2.4 | 3,741,775.9 | \$0.0150 | 24.8 | 300,453.8 | 4,506,806.3 |
| | LED: U-bend Type A [2 ft. x 2 ft. Conversion Kit] | 150 | D lamps | \$10 | \$1,500 | 0.0% | 0.0070 | 79.1 | 0.9 | 9,853.4 | \$5,852.96 | \$21,432.39 | \$27,285.35 | \$0.1522 | 15 | \$50.00 | \$7,500.00 | 3.6 | 147,801.1 | \$0.0101 | 1.1 | 11,868.0 | 178,020.0 |
| | LED: U-bend Type A [4 ft. Lamp Equivalent] LED: U-bend Type B [2 ft. x 2 ft. Conversion Kit] | 450 |) lamps) lamps | \$4 \$10 | \$1,800 \$1,500 | 0.0% | 0.0040 | 52.1 | 1.5 | 19,465.2 | \$10,033.64 \$5.852.96 | \$42,339.27 \$23.523.62 | \$52,372.91 \$29.376.58 | \$0.0925 \$0.1387 | 15 | \$20.00 | \$9,000.00 \$7,500.00 | 5.8 | 291,978.2 162.222.5 | \$0.0062 | 1.8 | 23,445.0 13.026.0 | 351,675.0 195.390.0 |
| | LED: U-bend Type B [4 ft. Lamp Equivalent] | 150 | D lamps | \$4 | \$600 | 0.0% | 0.0050 | 61.8 | 0.6 | 7,690.2 | \$4,180.68 | \$16,727.13 | \$20,907.81 | \$0.0780 | 15 | \$20.00 | \$3,000.00 | 7.0 | 115,352.9 | \$0.0052 | 0.8 | 9,262.5 | 138,937.5 |
| | LED: U-bend Type C [2 ft. x 2 ft. Conversion Kit] LED: U-bend Type C [4 ft. Lamp Equivalent] | 150 | D lamps D lamps | \$15 \$8 | \$2,250 \$1,200 | 0.0% | 0.0070 | 86.8 | 0.9 | 10,814.8 7,690.2 | \$5,852.96 \$4,180.68 | \$23,523.62 \$16,727.13 | \$29,376.58 \$20,907.81 | \$0.2080 | 15 | \$75.00 \$40.00 | \$11,250.00 \$6,000.00 | 2.6 | 162,222.5 115,352.9 | \$0.0139 \$0.0104 | 1.1 0.8 | 13,026.0 9,262.5 | 195,390.0 138,937.5 |
| | High Efficiency HVAC | 23,670 | 0 | | \$859,936 | 4.6% | | | 1,714 | 3,809,487 | \$11,584,329 | \$8,946,927 | \$20,531,255 | | | | \$4,299,680 | | 63,256,677 | | | 4,588,361 | 76,189,915 |
| | Chillers: Meets 2015 Energy Code Package Units: Better than Current Code | 5,500 | D Tons D Tons | \$45 \$175 | \$247,500 | 0 1.3% | 0.0550 | 267.8 | 251.2 46.5 | 1,222,875.2 458,464.1 | \$1,762,081.80 \$312,157.74 | \$3,320,723.00 \$997,216.72 | \$5,082,804.80 \$1,309,374.46 | \$0.2024 \$0.3817 | 20 | \$225.00 \$875.00 | \$1,237,500.00 \$875,000.00 | 4.1 1.5 | \$24,457,504.50 \$6,876,960.75 | \$0.0101 \$0.0254 | 302.5 | 1,472,900.0 552,200.0 | 29,458,000.0 8,283,000.0 |
| | Split Units: Better than Current Code | 270 | D Tons | \$175 | \$47,250 | 0.3% | 0.0870 | 725.2 | 19.5 | 162,566.3 | \$130,939.02 | \$353,602.00 | \$484,541.02 | \$0.2907 | 15 | \$875.00 | \$236,250.00 | 2.1 | \$2,438,494.07 | \$0.0194 | 23.5 | 195,804.0 | 2,937,060.0 |
| | Packaged VRF Air Conditioners - Existing Facility Packaged VRF Air Conditioners - New Construction | 250 | D Tons D Tons | \$250 | \$12,500 | 0.3% | 0.0680 | 676.7 | 2.8 | 28,091.5 | \$94,762.17 \$18,952.43 | \$61,102.55 | \$400,274.92 \$80,054.98 | \$0.4450 | 15 | \$1,250.00 | \$312,500.00 | 1.3 | \$421,372.63 | \$0.0297 | 3.4 | 33,835.0 | 2,537,625.0 |
| | Split VRF Air Conditioners - Existing Facility | 700 | D Tons | \$250 | \$175,000 | 0.9% | 0.0680 | 676.7 | 39.5 | 393,281.1 | \$265,334.08 | \$855,435.69 | \$1,120,769.76 | \$0.4450 | 15 | \$1,250.00 | \$875,000.00 | 1.3 | \$5,899,216.84 | \$0.0297 | 47.6 | 473,690.0 | 7,105,350.0 |
| | VFD - AHU | 600 | D hp | \$50 | \$30,000 | 0.1% | 0.1900 | 764.7 | 2.8 | 380,935.3 | \$635,463.97 | \$828,581.99 | \$1,464,045.96 | \$0.0788 | 15 | \$250.00 | \$150,000.00 | 9.8 | \$5,714,029.58 | \$0.0053 | 114.0 | 458,820.0 | 6,882,300.0 |
| | VFD - Chilled Water / Condenser Water | 1,200 | D hp | \$80 | \$96,000 | 0.5% | 0.2720 | 986.7 | 271.0 | 983,059.2 | \$1,819,433.68 | \$2,138,276.80 | \$3,957,710.48 | \$0.0977 | 15 | \$400.00 | \$480,000.00 | 8.2 | \$14,745,887.60 | \$0.0065 | 326.4 | 1,184,052.0 | 17,760,780.0 |
| | High Efficiency Motors | 14,030 | | 30 | \$1,080 | 0.5% | 0.0855 | 1.0 | 29 | 253,763 | \$193,426 | \$551,965 | \$745,392 | 50.1445 | 15 | \$0.80 | \$485,000 | 111.2 | 3,806,439 | \$0.0096 | 1,170.8 | 305,646 | 4,584,690 |
| | ECM - Fan Coil Fans | 900 | 0 motors | \$50 | \$45,000.00 | 0.2% | 0.0270 | 232.1 | 20.2 | 173,460.8 | \$135,454.16 | \$377,298.99 | \$512,753.15 | \$0.2594 | 15 | \$250.00 | \$225,000.00 | 2.3 | \$2,601,912.17 | \$0.0173 | 24.3 | 208,926.0 | 3,133,890.0 |
| | High Efficiency Water Heating | 640 |) Hiotors | 380 | \$101,900 | 0.5% | 0.0180 | 140.8 | 26 | 418,607 | \$160,160 | \$845,181 | \$1,005,342 | \$0.6476 | 15 | \$400.00 | \$200,000.00 | 0.9 | 5,867,808 | \$0.0432 | 10.4 | 504,194 | 7,067,520 |
| | Commercial Solar Water Heating - Elec. Res. | 160 | D Tons | \$250 | \$40,000.00 | 0.2% | 0.0330 | 942.6 | 4.4 | 125,216.3 | \$30,756.34 | \$340,025.44 | \$370,781.78 | \$0.3194 | 20 | \$1,250.00 | \$200,000.00 | 1.9 | \$2,504,326.25 | \$0.0160 | 5.3 | 150,817.6 | 3,016,352.0 |
| | Heat Pump - End-of-Life Upgrade | 300 | D Tons | \$65 | \$19,500.00 | 0.1% | 0.0330 | 942.6 | 8.2 | 234,780.6 | \$35,687.94 | \$364,222.25 | \$399,910.19 | \$0.0831 | 10 | \$325.00 | \$97,500.00 | 4.1 | \$2,347,805.86 | \$0.0083 | 9.9 | 282,783.0 | 2,827,830.0 |
| | Heat Pump - Conversion from Electric Resistance | 20 | D Tons | \$120 | \$2,400.00 | 0.0% | 0.0330 | 942.6 | 0.5 | 15,652.0 | \$2,379.20 | \$24,281.48 | \$26,660.68 | \$0.1533 | 10 | \$600.00 | \$12,000.00 | 2.2 | \$156,520.39 | \$0.0153 | 0.7 | 18,852.2 | 188,522.0 |
| | VFD Dom. Water Pomping VFD Dom. Water Boosters - VFD (\$3K per Sys.) | 200 |) hp | \$300 | \$60,000.00 | 0.3% | 0.0560 | 588.2 | 9.3 | 97,662.3 | \$62,431.55 | \$212,427.75 | \$274,859.30 | \$0.6144 | 15 | \$1,500.00 | \$300,000.00 | 0.9 | \$1,464,934.61 | \$0.0410 | 11.2 | 117,630.0 | 1,764,450.0 |
| | VFD Dom. Water Boosters - added HP Reduction | 300 | D hp reduced | \$80 | \$24,000.00 | 0.1% | 0.3730 | 3,921.0 | 92.9 | 976,618.1 | \$623,758.05 | \$2,124,266.64 | \$2,748,024.70 | \$0.0246 | 15 | \$400.00 | \$120,000.00 | 22.9 | \$14,649,271.40 | \$0.0016 | 111.9 | 1,176,294.0 | 17,644,410.0 |
| | Envelope Improvements | 72,400 | 0 11 <u>0</u> | 3223 | \$33,830 | 0.0% | 0.0950 | 1,125.2 | 60 | 292,736 | \$260,991 | \$454,131 | \$25,467.89 \$715,121 | 30.2413 | 15 | \$1,125.00 | \$169,150 | 2.5 | 2,927,362 | 30.0101 | 0.9 | 352,588 | 3,525,880 |
| | Window Tinting | 7,200 | D square feet | \$0.85 | \$6,120.00 | 0.0% | 0.0010 | 4.9 | 6.0 | 29,111.9 | \$25,954.87 | \$45,162.15 | \$71,117.02 | \$0.2102 | 10 | \$4.25 | \$30,600.00 | 2.3 | \$291,118.86 | \$0.0210 | 7.2 | 35,064.0 | 350,640.0 |
| | High Efficiency HVAC | 65,200 3,550 | o square reet | \$0.43 | \$365,000 | 0.1% | 0.0010 | 4.9 | 54.1 317 | 2,172,266 | \$1,554,266 | \$3,611,171 | \$5,165,437 | \$0.1051 | 10 | \$2.13 | \$1,825,000 | 4.6 | \$2,036,243.01 23,916,348 | \$0.0105 | 65.2 | 317,524.0 2,616,400 | 3,175,240.0 28,806,200 |
| | Guest Room Energy Management System | 1,500 | D units | \$75 | \$112,500.00 | 0.6% | 0.1000 | 750.0 | 124.5 | 934,031.3 | \$836,136.80 | \$2,031,634.92 | \$2,867,771.73 | \$0.1204 | 15 | \$375.00 | \$562,500.00 | 5.1 | \$14,010,468.75 | \$0.0080 | 150.0 | 1,125,000.0 | 16,875,000.0 |
| | Condominum Submetering | 50 2,000 | units units units | \$50 | \$2,500.00 \$250,000.00 | 0.0% | 0.1170 0.1130 | 1,028.0 720.0 | 4.9 187.6 | 42,674.9 1,195,560.0 | \$18,119.72 \$700,009.81 | \$54,437.55 \$1,525,098.66 | \$72,557.27 \$2,225,108.47 | \$0.0586 | 8 | \$250.00 \$625.00 | \$12,500.00 \$1,250,000.00 | 5.8 | \$341,398.80 \$9,564,480.00 | \$0.0073 | 5.9 226.0 | 51,400.0 1,440,000.0 | 411,200.0 11,520,000.0 |
| | Refrigeration Improvements | 800 | D Line Free | | \$26,000 | 0.1% | 0.0077 | | 18 | 178,288 | \$98,149 | \$321,100 | \$419,250 | 20 DDC | | Aco | \$130,000 | | 2,124,909 | 60.0275 | 0.7 | 214,740 | 2,559,360 |
| | Anti-Sweat Heater Controls | 200 | D Linear Feet | \$10 \$40 | \$2,000.00 | 0.0% | 0.0000 | 43.8 343.3 | 0.0 17.9 | 7,273.0 171,014.9 | \$0.00 \$98,149.39 | \$11,282.81 \$309,817.56 | \$11,282.81 \$407,966.95 | \$0.2750 \$0.1403 | 10 | \$50.00 \$200.00 | \$10,000.00 | 1.1 3.4 | \$72,729.90 \$2,052,178.74 | \$0.0275 | 0.0 21.6 | 8,760.0 205,980.0 | 87,600.0 2,471,760.0 |
| Tradi | tional Retail | | | | ¢ | 0.3% | | | | 256 052 | 1207 124 | ¢526.000 | (202.224 | | | | (200-000- | | 2 504 225 | | | 205.050 | 4 453 - 200 |
| | Garage Refrigerator / Freezer Bounty (Customer incentive) | 600 | D each | \$75 | \$40,000 \$18,750.00 | 0.2% | 0.1400 | 859.0 | 42 30.6 | 256,052 187,805.3 | \$265,524 \$194,740.98 | \$526,808 \$386,395.39 | \$792,331 \$581,136.37 | \$0.0998 | 14 | \$375.00 | \$200,000 \$93,750.00 | 6.2 | 3,584,726 \$2,629,274.45 | \$0.0071 | 35.0 | 296,950 214,750.0 | 4,157,300 3,006,500.0 |
| | Garage Refrigerator / Freezer Bounty (Recycler Incentive) | 250 | D each | \$25 | \$6,250.00 | 0.0% | 0.0000 | 0.0 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | \$0.0000 | 0 | \$125.00 | \$31,250.00 | 0.0 | \$0.00 | \$0.0000 | 0.0 | 0.0 | 0.0 |
| | Nemgerator (with Netyching of Old) | 100 | eacn | \$150 | \$15,000.00 | U.1% | 0.1340 | 822.0 | 11.1 | b8,24b.b | \$/U,/82.89 | \$14U,412.1/ | \$211,195.06 | 50.2198 | 14 | \$750.00 | \$75,000.00 | 2.8 | \$955,451./0 | 20.0157 | 13.4 | 82,200.0 | 1,150,800.0 |

| | Quantity | Unit | Average Incentive | Incentive Budget | % Deman of | d Savings Ene per Unit | rgy Savings f | 1st Year | 1st Year | Demand Derived | Energy Derived | Utility Avoided Cost Total Resource Benefit | Program-Level 1st Year | Measure | Average TRC | Total Resource Cost | TRB / TRC | Lifetime | Program-Level Lifetime | 1st Year | 1st Year | Lifetime |
|--|------------|---------------|----------------------|-----------------------------|---------------|---------------------------|---------------|-----------------------|-------------------------|------------------------------|----------------------------|--|---------------------------|----------|--------------------------|---------------------------|------------|------------------------------|---------------------------|------------------------|-------------------------|-------------------------|
| | | | per Unit | per Measure B | Budget | (kW) | (kWh) | emand Savings (kW) | Energy Savings (kWh) | TRB | TRB | (TRB) | \$/kWh | Life | per Unit | (TRC) | Ratio | Energy Savings (kWh) | \$/kWh | Demand Savings (kW) | Energy Savings (kWh) | Energy Savings (kWh) |
| irect Incentives | | | | | | | | | | | | | | | | | | | | | | |
| COMMERCIAL RESOURCE ACQUISITION | | | | | | | | | | | | | | | | | | | | | | |
| CBEEM | | | | \$4,658,529 2 | 4.7% | | | 2,260 | 33,061,449 | \$14,380,654 | \$68,021,457 | \$82,402,111 | | | | \$23,292,646 | | 462,860,283 | | | 39,821,077 | 557,495,072 |
| Trade Ally Provided High Efficiency Lighting | 25.000.000 | | | \$3.000.000.00 | 15.9% | | | 1.419 | 20.756.250 | \$9.028.293 | \$42.704.431 | \$51.732.724 | | | | \$15.000.000 | | 290.587.500 | | | 25.000.000 | 350.000.000 |
| Customized Project Measures - Over 5 Year Life: LED | 25,000,000 | kWh | \$0.12 | \$3,000,000.00 | 15.9% | 0.0001 | 1.0 | 1,419.0 | 20,756,250.0 | \$9,028,293.02 | \$42,704,431.46 | \$51,732,724.48 | \$0.1445 | 14 | \$0.60 | \$15,000,000.00 | 3.4 | \$290,587,500.00 | \$0.0103 | 1,709.2 | 25,000,000.0 | 350,000,000.0 |
| High Efficiency HVAC Customized Project Measures - Over 5 Year Life: HVAC | 1,500,000 | kWh | \$0.12 | \$180,000 | 1.0% | 0.0001 | 1.0 | 85.1 | 1,245,375 | \$541,698 \$541,697.58 | \$2,562,265 | \$3,103,963 \$3,103,963.47 | \$0.1445 | 14 | \$0.60 | \$900,000 \$900,000.00 | 3.4 | \$17,435,250 | \$0.0103 | 102.5 | 1,500,000 | 21,000,000 |
| High Efficiency TBD | 13,321,077 | Laud. | 60.42 | \$1,478,529.19 | 7.8% | 0.0004 | 4.0 | 756 | 11,059,824 | \$4,810,663 | \$22,754,760 | \$27,565,423 | 60.4445 | | | \$7,392,646 | | 154,837,533 | 60.0400 | 705.0 | 13,321,077 | 186,495,072 |
| Customized Project Measures - Over 5 Year Life: Non-LED Customized Project Measures - Less than 5 Year Life: Non-LED | 3,000,000 | kWh | \$0.12 \$0.08 | \$1,238,529.19 \$240,000 | 1.3% | 0.0001 | 1.0 | 170.3 | 2,490,750.0 | \$1,083,395.16 | \$5,124,531.78 | \$6,207,926.94 | \$0.0964 | 14 14 | \$0.60 | \$1,200,000.00 | 3.4 5.2 | \$34,870,500.00 | \$0.0069 | 205.1 | 3,000,000.0 | 42,000,000.0 |
| BESM | | | | \$214,883 1 | .1% | | | 91 | 794,416 | \$4,708 | \$146,006 | \$150,714 | | | | \$1,074,413 | | 834,169 | | | 755,400 | 793,200 |
| Trade Ally Provided | | | | 44.000 | a av/ | | | | 5.670 | 44.700 | 67.044 | 44.070 | | | | 65.000 | | | | | | 40.000 |
| Commercial Property Submetering (Pilot / TBD) | 5 | units metered | \$200 | \$1,000 | 0.0% | 0.2400 | 1,080.0 | 1.3 | 5,678.9 | \$4,708 | \$7,244 | \$11,952.25 | \$0.1761 | 8 | \$1,000.00 | \$5,000 | 2.4 | \$45,431 | \$0.0220 | 1.2 | 5,400 | 43,200 |
| High Efficiency HVAC | 5 | Llaite | \$3,500 | \$12,500 | 0.1% | 0.0000 | 0.0 | 0 | 0 | \$0 | \$0 | \$0 | £0.0000 | 20 | 612 500 00 | \$62,500 | 0.0 | 0 | £0.0000 | 0.0 | 0 | c |
| Energy Study Grant | 90,450 | Units | \$2,500 | \$66,383 | 0.4% | 0.0000 | 0.0 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | \$0.0000 | 20 | \$12,500.00 | \$331,913 | 0.0 | \$0.00 | \$0.0000 | 0.0 | 0.0 | 0.0 |
| Design Assistance | 30,000 | square feet | \$0.50 | \$15,000 | 0.1% | 0.0000 | 0.0 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | \$0.0000 | 1 | \$2.50 | \$75,000.00 | 0.0 | \$0.00 | \$0.0000 | 0.0 | 0.0 | 0.0 |
| Energy Study Assistance | 30,225 | square feet | \$0.85 | \$25,691 | 0.1% | 0.0000 | 0.0 | 0.0 | 0.0 | \$0.00 | \$0.00 | \$0.00 | \$0.0000 | 1 | \$4.25 | \$128,456.42 | 0.0 | \$0.00 | \$0.0000 | 0.0 | 0.0 | 0.0 |
| Commissioning / Recommissioning System Retrocommissioning Study Fee | 750,000 | Projects | \$15,000 | \$135,000.00 | 0.7% | 0.0000 | 0.0 | 90 | 788,738 | \$0 \$0.00 | \$138,762 | \$138,762 | \$0,0000 | 1 | \$75,000,00 | \$675,000 | 0.0 | 788,738 | \$0,0000 | 0.0 | 750,000 | 750,000 |
| System Retrocommissioning | 750,000 | kWh | \$0.08 | \$60,000 | 0.3% | 0.0001 | 1.0 | 90.0 | 788,737.5 | \$0.00 | \$138,761.84 | \$138,761.84 | \$0.0761 | 1 | \$0.40 | \$300,000.00 | 0.5 | \$788,737.50 | \$0.0761 | 85.6 | 750,000.0 | 750,000.0 |
| BHTR | | | | \$2,987,669 1 | 5.8% | | | 2,578 | 11,436,910 | \$11,445,918 | \$22,978,675 | \$34,424,594 | | | | \$4,014,569 | | 156,084,746 | | | 10,435,803 | 142,422,186 |
| Trade Ally Provided | 200 | | | 424.0.000 | | | | | 005.070 | 4007 745 | 64 000 000 | 42.001.422 | | | | A4 050 000 | | 40.000.405 | | | 700.000 | |
| Kitchen Equipment Kitchen Exhaust Hood Demand Ventilation | 300 | HP | \$700 | \$210,000 | 1.1% | 0.4520 | 2,633.6 | 149 | 865,875.7 | \$997,745.32 | \$1,883,388 | \$2,881,133 \$2,881,133.31 | \$0.2425 | 15 | \$3,500.00 | \$1,050,000 | 2.7 | \$12,988,135 | \$0.0162 | 135.6 | 790,083 | 11,851,245.0 |
| Traditional Retail | | | | £46.725 | 0.2% | | | 109 | FCA 107 | ¢590.495 | 61 032 132 | ¢1 €11 €00 | | | | 6333 635 | | 6 770 200 | | | 514.912 | (177 73 |
| Commercial Ritchen Combination Oven: <15 pans | 3 | Pans | \$500 | \$46,725 | 0.0% | 2.2260 | 11,604.4 | 7.3 | 38,152.9 | \$40,054.77 | \$69,119.40 | \$1,511,508 \$109,174.17 | \$0.0393 | 12 | \$2,500.00 | \$7,500.00 | 14.6 | \$457,835.15 | \$0.0033 | 6.7 | 34,813.3 | 417,759.5 |
| Combination Oven: > 28 pans | 3 | Pans | \$2,400 | \$7,200 | 0.0% | 4.5560 | 23,755.7 | 15.0 | 78,103.6 | \$81,980.92 | \$141,495.65 | \$223,476.56 | \$0.0922 | 12 | \$12,000.00 | \$36,000.00 | 6.2 | \$937,243.06 | \$0.0077 | 13.7 | 71,267.0 | 855,203.4 |
| Combination Oven: 15-28 pans Commercial Fryer: Large Vat | 3 | Pans Vats | \$500 \$250 | \$1,500 \$750 | 0.0% | 3.0690 | 2.659.3 | 10.1 2.0 | 52,614.7 8.743.2 | \$55,223.76 \$10,922.39 | \$95,318.94 \$15.839.51 | \$150,542.69 \$26,761.91 | \$0.0285 \$0.0858 | 12 | \$2,500.00 \$1.250.00 | \$7,500.00 \$3,750.00 | 20.1 | \$631,376.41 \$104,918.24 | \$0.0024 | 9.2 | 48,009.2 | 576,110. |
| Commercial Fryer: Standard Vat | 3 | Vats | \$250 | \$750 | 0.0% | 0.2500 | 1,093.1 | 0.8 | 3,593.9 | \$4,498.51 | \$6,510.77 | \$11,009.28 | \$0.2087 | 12 | \$1,250.00 | \$3,750.00 | 2.9 | \$43,126.20 | \$0.0174 | 0.8 | 3,279.3 | 39,351.2 |
| Commercial Ice Machine: IHR > 1,500 | 3 | Unit | \$325 | \$975 | 0.0% | 0.4160 | 3,641.0 | 1.4 | 11,970.8 | \$7,485.53 | \$21,686.87 | \$29,172.40 | \$0.0814 | 12 | \$1,625.00 | \$4,875.00 | 6.0 | \$143,650.12 | \$0.0068 | 1.2 | 10,923.0 | 131,076.0 |
| Commercial Ice Machine: IHR 101-300 | 3 | Unit | \$100 | \$300 | 0.0% | 0.0920 | 805.0 | 0.3 | 2,646.7 | \$1,655.45 | \$4,794.82 | \$6,450.27 | \$0.1133 | 12 | \$500.00 | \$1,500.00 | 4.3 | \$31,760.05 | \$0.0094 | 0.3 | 2,415.0 | 28,980.0 |
| Commercial Ice Machine: IHR 301-500 | 3 | Unit | \$100 | \$300 | 0.0% | 0.1280 | 1,117.0 | 0.4 | 3,672.5 | \$2,303.24 | \$6,653.18 | \$8,956.42 | \$0.0817 | 12 | \$500.00 | \$1,500.00 | 6.0 | \$44,069.54 | \$0.0068 | 0.4 | 3,351.0 | 40,212.0 |
| Commercial Ice Machine: IHR 501-1,000 Convection Ovens: Full Size | 3 | Unit | \$100 | \$300 \$1.050 | 0.0% | 0.2060 | 1,807.0 | 0.7 | 5,941.0 | \$3,706.78 | \$10,763.02 | \$14,469.80 | \$0.0505 \$0.1700 | 12 | \$500.00 \$1.750.00 | \$1,500.00 | 9.6 | \$71,292.44 | \$0.0042 | 0.6 | 5,421.0 | 65,052.0 |
| Convection Ovens: Half Size | 3 | Unit | \$275 | \$825 | 0.0% | 0.3810 | 1,987.9 | 1.3 | 6,535.8 | \$6,855.74 | \$11,840.58 | \$18,696.31 | \$0.1262 | 12 | \$1,375.00 | \$4,125.00 | 4.5 | \$78,429.97 | \$0.0105 | 1.1 | 5,963.7 | 71,564.8 |
| Electric Griddle | 3 | Linear Feet | \$1,250 | \$3,750 | 0.0% | 0.1730 | 757.9 | 0.6 | 2,491.8 | \$3,112.97 | \$4,514.16 | \$7,627.13 | \$1.5050 | 12 | \$6,250.00 | \$18,750.00 | 0.4 | \$29,901.00 | \$0.1254 | 0.5 | 2,273.6 | 27,283. |
| Hot Food Holding Cabinet: Full Size Hot Food Holding Cabinet: Half Size | 3 | Unit | \$800 \$125 | \$2,400 \$375 | 0.0% | 0.7200 | 3,942.0 | 2.4 | 12,960.5 | \$12,955.72 \$5,938.04 | \$23,479.71 \$10.761.54 | \$36,435.43 \$16,699.57 | \$0.1852 \$0.0631 | 12 | \$4,000.00 \$625.00 | \$12,000.00 \$1.875.00 | 3.0 | \$155,525.62 \$71.282.57 | \$0.0154 | 2.2 | 11,826.0 5.420.3 | 141,912.0 65.043.0 |
| Reach-In Freezer: Glass Door: 0 <v<15 (1="" door)<="" td=""><td>3</td><td>Unit</td><td>\$0</td><td>\$0</td><td>0.0%</td><td>0.1780</td><td>1,562.0</td><td>0.6</td><td>5,135.6</td><td>\$3,202.94</td><td>\$9,303.85</td><td>\$12,506.79</td><td>\$0.0000</td><td>12</td><td>\$0.00</td><td>\$0.00</td><td>0.0</td><td>\$61,627.12</td><td>\$0.0000</td><td>0.5</td><td>4,686.1</td><td>56,232.</td></v<15> | 3 | Unit | \$0 | \$0 | 0.0% | 0.1780 | 1,562.0 | 0.6 | 5,135.6 | \$3,202.94 | \$9,303.85 | \$12,506.79 | \$0.0000 | 12 | \$0.00 | \$0.00 | 0.0 | \$61,627.12 | \$0.0000 | 0.5 | 4,686.1 | 56,232. |
| Reach-In Freezer: Glass Door: 15 <v<30 (1="" door)<="" td=""><td>3</td><td>Unit</td><td>\$100</td><td>\$300</td><td>0.0%</td><td>0.2280</td><td>2,001.1</td><td>0.7</td><td>6,579.2</td><td>\$4,102.64</td><td>\$11,919.20</td><td>\$16,021.85</td><td>\$0.0456</td><td>12</td><td>\$500.00</td><td>\$1,500.00</td><td>10.7</td><td>\$78,950.75</td><td>\$0.0038</td><td>0.7</td><td>6,003.3</td><td>72,040.0</td></v<30> | 3 | Unit | \$100 | \$300 | 0.0% | 0.2280 | 2,001.1 | 0.7 | 6,579.2 | \$4,102.64 | \$11,919.20 | \$16,021.85 | \$0.0456 | 12 | \$500.00 | \$1,500.00 | 10.7 | \$78,950.75 | \$0.0038 | 0.7 | 6,003.3 | 72,040.0 |
| Reach-In Freezer: Glass Door: 50 <v (3="" door)<="" td=""><td>3</td><td>Unit</td><td>\$200</td><td>\$600</td><td>0.0%</td><td>0.7750</td><td>6,789.0</td><td>2.5</td><td>22,320.8</td><td>\$13,945.39</td><td>\$40,437.28</td><td>\$54,382.68</td><td>\$0.0269</td><td>12</td><td>\$1,000.00</td><td>\$3,000.00</td><td>13.5</td><td>\$267,849.68</td><td>\$0.0022</td><td>2.3</td><td>20,367.0</td><td>244,404.0</td></v> | 3 | Unit | \$200 | \$600 | 0.0% | 0.7750 | 6,789.0 | 2.5 | 22,320.8 | \$13,945.39 | \$40,437.28 | \$54,382.68 | \$0.0269 | 12 | \$1,000.00 | \$3,000.00 | 13.5 | \$267,849.68 | \$0.0022 | 2.3 | 20,367.0 | 244,404.0 |
| Reach-In Freezer: Solid Door: 0 <v<15 (1="" door)<="" td=""><td>3</td><td>Unit</td><td>\$100</td><td>\$300</td><td>0.0%</td><td>0.0520</td><td>458.1</td><td>0.2</td><td>1,506.1</td><td>\$935.69</td><td>\$2,728.46</td><td>\$3,664.15</td><td>\$0.1992</td><td>12</td><td>\$500.00</td><td>\$1,500.00</td><td>2.4</td><td>\$18,072.85</td><td>\$0.0166</td><td>0.2</td><td>1,374.2</td><td>16,490.9</td></v<15> | 3 | Unit | \$100 | \$300 | 0.0% | 0.0520 | 458.1 | 0.2 | 1,506.1 | \$935.69 | \$2,728.46 | \$3,664.15 | \$0.1992 | 12 | \$500.00 | \$1,500.00 | 2.4 | \$18,072.85 | \$0.0166 | 0.2 | 1,374.2 | 16,490.9 |
| Reach-In Freezer: Solid Door: 15 <v<30 (1="" door)<br="">Reach-In Freezer: Solid Door: 30<v<50 (2="" door)<="" td=""><td>3</td><td>Unit</td><td>\$250</td><td>\$750</td><td>0.0%</td><td>0.0990</td><td>868.7</td><td>0.3</td><td>2,856.1</td><td>\$1,781.41</td><td>\$5,174.23</td><td>\$6,955.64</td><td>\$0.2626 \$0.1452</td><td>12</td><td>\$1,250.00</td><td>\$3,750.00</td><td>1.9</td><td>\$34,273.24</td><td>\$0.0219</td><td>0.3</td><td>2,606.1</td><td>31,273.2</td></v<50></v<30> | 3 | Unit | \$250 | \$750 | 0.0% | 0.0990 | 868.7 | 0.3 | 2,856.1 | \$1,781.41 | \$5,174.23 | \$6,955.64 | \$0.2626 \$0.1452 | 12 | \$1,250.00 | \$3,750.00 | 1.9 | \$34,273.24 | \$0.0219 | 0.3 | 2,606.1 | 31,273.2 |
| Reach-In Freezer: Solid Door: 50 <v (3="" door)<="" td=""><td>3</td><td>Unit</td><td>\$300</td><td>\$900</td><td>0.0%</td><td>0.3990</td><td>3,492.0</td><td>1.3</td><td>11,480.8</td><td>\$7,179.63</td><td>\$20,799.14</td><td>\$27,978.77</td><td>\$0.0784</td><td>12</td><td>\$1,500.00</td><td>\$4,500.00</td><td>6.2</td><td>\$137,769.97</td><td>\$0.0065</td><td>1.2</td><td>10,475.9</td><td>125,710.6</td></v> | 3 | Unit | \$300 | \$900 | 0.0% | 0.3990 | 3,492.0 | 1.3 | 11,480.8 | \$7,179.63 | \$20,799.14 | \$27,978.77 | \$0.0784 | 12 | \$1,500.00 | \$4,500.00 | 6.2 | \$137,769.97 | \$0.0065 | 1.2 | 10,475.9 | 125,710.6 |
| Reach-In Refrigerator: Glass Door: 0 <v<15 (1="" door)<="" td=""><td>3</td><td>Unit</td><td>\$100</td><td>\$300</td><td>0.0%</td><td>0.0820</td><td>720.2</td><td>0.3</td><td>2,367.7</td><td>\$1,475.51</td><td>\$4,289.43</td><td>\$5,764.94</td><td>\$0.1267</td><td>12</td><td>\$500.00</td><td>\$1,500.00</td><td>3.8</td><td>\$28,412.42</td><td>\$0.0106</td><td>0.2</td><td>2,160.5</td><td>25,925.4</td></v<15> | 3 | Unit | \$100 | \$300 | 0.0% | 0.0820 | 720.2 | 0.3 | 2,367.7 | \$1,475.51 | \$4,289.43 | \$5,764.94 | \$0.1267 | 12 | \$500.00 | \$1,500.00 | 3.8 | \$28,412.42 | \$0.0106 | 0.2 | 2,160.5 | 25,925.4 |
| Reach-In Refrigerator: Glass Door: 15 <v<30 (1="" door)<br="">Reach-In Refrigerator: Glass Door: 30<v<50 (2="" door)<="" td=""><td>3</td><td>Unit</td><td>\$200</td><td>\$600</td><td>0.0%</td><td>0.0770</td><td>713.6</td><td>0.3</td><td>2,208.1</td><td>\$1,385.54 \$1.457.52</td><td>\$4,000.25</td><td>\$5,385.79</td><td>\$0.2717</td><td>12</td><td>\$1,000.00</td><td>\$3,000.00</td><td>1.8</td><td>\$26,496.96 \$28,153,21</td><td>\$0.0226</td><td>0.2</td><td>2,014.8</td><td>24,177.8</td></v<50></v<30> | 3 | Unit | \$200 | \$600 | 0.0% | 0.0770 | 713.6 | 0.3 | 2,208.1 | \$1,385.54 \$1.457.52 | \$4,000.25 | \$5,385.79 | \$0.2717 | 12 | \$1,000.00 | \$3,000.00 | 1.8 | \$26,496.96 \$28,153,21 | \$0.0226 | 0.2 | 2,014.8 | 24,177.8 |
| Reach-In Refrigerator: Glass Door: 50 <v (3="" door)<="" td=""><td>3</td><td>Unit</td><td>\$300</td><td>\$900</td><td>0.0%</td><td>0.1020</td><td>890.6</td><td>0.3</td><td>2,928.1</td><td>\$1,835.39</td><td>\$5,304.68</td><td>\$7,140.07</td><td>\$0.3074</td><td>12</td><td>\$1,500.00</td><td>\$4,500.00</td><td>1.6</td><td>\$35,137.27</td><td>\$0.0256</td><td>0.3</td><td>2,671.8</td><td>32,061.6</td></v> | 3 | Unit | \$300 | \$900 | 0.0% | 0.1020 | 890.6 | 0.3 | 2,928.1 | \$1,835.39 | \$5,304.68 | \$7,140.07 | \$0.3074 | 12 | \$1,500.00 | \$4,500.00 | 1.6 | \$35,137.27 | \$0.0256 | 0.3 | 2,671.8 | 32,061.6 |
| Reach-In Refrigerator: Solid Door: 0 <v<15 (1="" door)<="" td=""><td>3</td><td>Unit</td><td>\$250</td><td>\$750</td><td>0.0%</td><td>0.0300</td><td>259.7</td><td>0.1</td><td>853.8</td><td>\$539.82</td><td>\$1,546.85</td><td>\$2,086.67</td><td>\$0.8784</td><td>12</td><td>\$1,250.00</td><td>\$3,750.00</td><td>0.6</td><td>\$10,246.07</td><td>\$0.0732</td><td>0.1</td><td>779.1</td><td>9,349.2</td></v<15> | 3 | Unit | \$250 | \$750 | 0.0% | 0.0300 | 259.7 | 0.1 | 853.8 | \$539.82 | \$1,546.85 | \$2,086.67 | \$0.8784 | 12 | \$1,250.00 | \$3,750.00 | 0.6 | \$10,246.07 | \$0.0732 | 0.1 | 779.1 | 9,349.2 |
| Reach-In Refrigerator: Solid Door: 30 <v<50 (2="" door)<="" td=""><td>3</td><td>Unit</td><td>\$300</td><td>\$900</td><td>0.0%</td><td>0.0900</td><td>790.3</td><td>0.2</td><td>2,598.2</td><td>\$1,619.46</td><td>\$4,706.96</td><td>\$6,326.43</td><td>\$0.3464</td><td>12</td><td>\$1,500.00</td><td>\$4,500.00</td><td>1.4</td><td>\$31,178.11</td><td>\$0.0289</td><td>0.2</td><td>2,370.8</td><td>28,449.0</td></v<50> | 3 | Unit | \$300 | \$900 | 0.0% | 0.0900 | 790.3 | 0.2 | 2,598.2 | \$1,619.46 | \$4,706.96 | \$6,326.43 | \$0.3464 | 12 | \$1,500.00 | \$4,500.00 | 1.4 | \$31,178.11 | \$0.0289 | 0.2 | 2,370.8 | 28,449.0 |
| Reach-In Refrigerator: Solid Door: 50 <v (3="" door)<="" td=""><td>3</td><td>Unit</td><td>\$500</td><td>\$1,500</td><td>0.0%</td><td>0.1260</td><td>1,103.8</td><td>0.4</td><td>3,628.9</td><td>\$2,267.25</td><td>\$6,574.32</td><td>\$8,841.57</td><td>\$0.4133</td><td>12</td><td>\$2,500.00</td><td>\$7,500.00</td><td>1.2</td><td>\$43,547.17</td><td>\$0.0344</td><td>0.4</td><td>3,311.3</td><td>39,735.4</td></v> | 3 | Unit | \$500 | \$1,500 | 0.0% | 0.1260 | 1,103.8 | 0.4 | 3,628.9 | \$2,267.25 | \$6,574.32 | \$8,841.57 | \$0.4133 | 12 | \$2,500.00 | \$7,500.00 | 1.2 | \$43,547.17 | \$0.0344 | 0.4 | 3,311.3 | 39,735.4 |
| Steam Cooker: 1 Pan Steam Cooker: 2 Pans | 3 | Unit | \$750 | \$2,250 | 0.0% | 0.7590 | 3,322.3 | 2.5 | 10,922.9 | \$13,657.49 | \$19,788.30 | \$33,445.79 \$66,891,57 | \$0.2060 | 12 | \$3,750.00 | \$11,250.00 | 3.0 | \$131,074.32 \$262,148,65 | \$0.0172 | 2.3 | 9,966.8 | 119,601.0 239,202 (|
| Steam Cooker: 3 Pans | 3 | Unit | \$750 | \$2,250 | 0.0% | 2.2770 | 9,966.8 | 7.5 | 32,768.6 | \$40,972.46 | \$59,364.90 | \$100,337.36 | \$0.0687 | 12 | \$3,750.00 | \$11,250.00 | 8.9 | \$393,222.97 | \$0.0057 | 6.8 | 29,900.3 | 358,803.0 |
| Steam Cooker: 4 Pans | 3 | Unit | \$750 | \$2,250 | 0.0% | 3.0360 | 13,289.0 | 10.0 | 43,691.4 | \$54,629.95 | \$79,153.20 | \$133,783.15 | \$0.0515 | 12 | \$3,750.00 | \$11,250.00 | 11.9 | \$524,297.30 | \$0.0043 | 9.1 | 39,867.0 | 478,404.0 |
| Steam Cooker: 6 Pans | 3 | Unit | \$750 | \$2,250 | 0.0% | 4.5540 | 19,933.5 | 12.5 | 65,537.2 | \$81,944.93 | \$118,729.80 | \$200,674.72 | \$0.0343 | 12 | \$3,750.00 | \$11,250.00 | 14.5 | \$786,445.94 | \$0.0029 | 13.7 | 59,800.5 | 717,606.0 |
| Program Direct Install Energy Advantage Program (formerly SBDII) | 8,250.000 | | | \$2,310,000.00 | 12.2% | | | 1.032 | 9.041.423 | \$6,566,701 | \$18,602,050 | \$25,168,752 | | | | \$2,310,000 | | 126,579,915 | | | 8,250,000 | 115,500,000 |
| Flat Rate Measures (Energy Advantage Program, formerly SBDIL) | 8,250,000 | kWh | \$0.28 | \$2,310,000 | 12.2% | 0.0001 | 1.0 | 1,032.1 | 9,041,422.5 | \$6,566,701.26 | \$18,602,050.34 | \$25,168,751.61 | \$0.2555 | 14 | \$0.28 | \$2,310,000.00 | 10.9 | \$126,579,915.00 | \$0.0182 | 941.8 | 8,250,000.0 | 115,500,000.0 |
| Non-Profit Program | 175,000 | kW/b | \$0.78 | \$49,000.00 | 0.3% | 0.0001 | 1.0 | 22 | 191,788 | \$139,294 | \$394,589 | \$533,883 | \$0.2555 | 14 | \$0.78 | \$49,000 | 10.9 | 2,685,029 | \$0.0182 | 20.0 | 175,000 | 2,450,000 |
| G, J or P Scheduled Multi-Family Direct Install (Energy Smart 4 Homes) | 13,465 | NYVII | <i>2</i> 0.28 | \$287,444.35 | 1.5% | 0.0001 | 1.0 | 1,233 | 588,261 | \$2,957,533 | \$721,617 | \$3,679,150 | 30.2333 | 14 | 20.28 | \$287,444 | 10.9 | 4,672,325 | 20.0102 | 20.0 | 536,769 | 4,263,343 |
| Advanced Power Strips - Tier I | 2,100 | each | \$24.23 | \$50,883 | 0.3% | 0.0060 | 62.4 | 13.8 | 143,541.6 | \$31,904.40 | \$119,318.02 | \$151,222.42 | \$0.3545 | 5 | \$24.23 | \$50,883.00 | 3.0 | \$717,708.12 | \$0.0709 | 12.6 | 130,977.0 | 654,885.0 |
| Aerator Bathroom Aerator Kitchen | 1,100 | each | \$7.35 \$8.51 | \$8,085 \$7,234 | 0.0% | 0.2130 | 16.2 | 256.8 | 19,529.5 115.315.4 | \$593,269.95 \$748.993.81 | \$16,233.74 \$95.855.16 | \$609,503.69 \$844.848.97 | \$0.4140 \$0.0627 | 5 | \$7.35 \$8.51 | \$8,085.00 \$7,233.50 | 75.4 | \$97,647.36 \$576.576.99 | \$0.0828 \$0.0125 | 234.3 | 17,820.0 | 89,100.0 526 107 0 |
| LED A19 | 5,900 | each | \$6.50 | \$38,350 | 0.2% | 0.0032 | 22.5 | 20.7 | 145,484.7 | \$138,919.11 | \$316,447.46 | \$455,366.57 | \$0.2636 | 15 | \$6.50 | \$38,350.00 | 11.9 | \$2,182,270.61 | \$0.0176 | 18.9 | 132,750.0 | 1,991,250.0 |
| LED 5W Candelabra | 180 | each | \$7.65 | \$1,377 | 0.0% | 0.0032 | 22.5 | 0.6 | 4,438.5 | \$4,238.21 | \$9,654.33 | \$13,892.54 | \$0.3102 | 15 | \$7.65 | \$1,377.00 | 10.1 | \$66,577.75 | \$0.0207 | 0.6 | 4,050.0 | 60,750.0 |
| Showerhead Fixed | 940 530 | each | \$15.80 | \$8,374 | 0.0% | 0.7180 | 160.0 | 5.3 417.0 | 25,178.9 92,934.9 | \$963,563.58 | \$77,251.49 | \$1,040,815.06 | \$0.0901 | 13 | \$9.43 \$15.80 | \$8,374.00 | 124.3 | \$464,674.32 | \$0.0255 | 3.0 380.5 | 21,130.0 84,800.0 | 424,000.0 |
| Showerhead Handheld | 250 | each | \$23.32 | \$5,830 | 0.0% | 0.7180 | 160.0 | 196.7 | 43,837.2 | \$454,511.12 | \$36,439.38 | \$490,950.50 | \$0.1330 | 5 | \$23.32 | \$5,830.00 | 84.2 | \$219,186.00 | \$0.0266 | 179.5 | 40,000.0 | 200,000.0 |
| Site Visit Fee Special Need Opportunities | 1,615 | each | \$98.11 | \$158,448 \$84,500.00 | 0.4% | 0.0000 | 0.0 | 0.0 | 0.0 185,3 <u>66</u> | \$0.00 \$195,160 | \$0.00 \$354,908 | \$0.00 \$550.068 | \$0.0000 | 0 | \$98.11 | \$158,447.65 \$84,500 | 0.0 | \$0.00 2,388,974 | \$0.0000 | 0.0 | 0.0 169.140 | 0.0 2,179.860 |
| Window AC with Recycling | 190 | each | \$150.00 | \$28,500.00 | 0.2% | 0.0540 | 123.8 | 11.2 | 41,228.9 | \$45,666.42 | \$58,357.90 | \$104,024.32 | \$0.6913 | 9 | \$150.00 | \$28,500.00 | 3.6 | \$371,059.98 | \$0.0768 | 10.3 | 37,620.0 | 338,580.0 |
| Retrigerator (with Recycling of Old) | 160 | each | \$350.00 | \$56,000.00 | 0.3% | 0.1340 | 22.5 | 23.5 | 144,136.7 | \$149,493.46 | \$296,550.50 | \$446,043.97 | \$0.3885 | 14 | \$350.00 | \$56,000.00 | 8.0 | \$2,017,913.99 | \$0.0278 | 21.4 | 131,520.0 | 1,841,280.0 |

| DENTIAL | PROGRAMS | Budget |
|------------------------------------|--|--|
| RTRAN | | \$1.051.373 |
| Program Ma | nagement | \$238,55 |
| Ū | Program Management | \$238,55 |
| Behavior Ch | ange | \$451,35 |
| | Community Workshops (Hard to Reach, Energy Literacy) | \$270,46 |
| | Youth Energy Education and Events | \$86,65 |
| | Enhanced Engagement (Gamification) | \$94,24 |
| Professional | Development and Technical Training | \$101,34 |
| | Clean Energy Ally Support | \$5,63 |
| | Educator Training and Grants | \$95,71 |
| Energy in De | cision Making | \$83,43 |
| | Community Based Energy Efficiency | \$83,43 |
| Codes and S | tandards | \$98,15 |
| | Codes Training, Technical Support, Advocacy | \$39,26 |
| | Standards Enhancement and Leading Edge Tech | \$58,88 |
| Clean Energy | / Collaboration | \$78,53 |
| | Innovation and Emerging Technologies | \$78,53 |
| BTRAN | | \$1,098,627 |
| Program Ma | nagement | \$213,45 |
| | Program Management | \$213,45 |
| Behavior Ch | ange | \$12,32 |
| | Community Education Support, Events | \$12,32 |
| Professional | Development and Technical Training | \$401,93 |
| | Clean Energy Ally Support | \$101,77 |
| | Targeted Ally Training Opportunities | \$208,00 |
| | Targeted Participant Training Opportunities | \$26,19 |
| | Energy Industry Workforce Development | \$65,96 |
| Energy in De | cision Making | \$298,55 |
| | Strategic Energy Management, Customer Engagement | \$230,99 |
| | Data Analytics | \$56,30 |
| | Rural Water/Wastewater Support | \$11,26 |
| | tandards | \$92,33 |
| Codes and S | | \$44.89 |
| Codes and S | Codes Training, Technical Support, Advocacy | Ç0,++Ç |
| Codes and S | Codes Training, Technical Support, Advocacy Standards Enhancement and Leading Edge Tech | \$47,43 |
| Codes and S Clean <u>Energy</u> | Codes Training, Technical Support, Advocacy Standards Enhancement and Leading Edge Tech / Collaboration | \$47,43 \$80,02 |
| Codes and Si Clean Energy | Codes Training, Technical Support, Advocacy Standards Enhancement and Leading Edge Tech / Collaboration Integrated Demand Side Management | \$47,43 \$47,43 \$80,02 \$23,71 |

| % of Budget | |
|--|--|
| 48.9% | |
| 1.3% | |
| 1.3% | |
| 2.4% | |
| 1.4% | |
| 0.5% | |
| 0.5% | |
| 0.5% | |
| 0.0% | |
| 0.5% | |
| 0.4% | |
| 0.4% | |
| 0.5% | |
| 0.2% | |
| 0.3% | |
| 0.4% | |
| 0.4% | |
| | |
| 51.1% | |
| 1.1% | |
| | |
| 1.1% | |
| 1.1% 0.1% | |
| 1.1% 0.1% 0.1% | |
| 1.1% 0.1% 0.1% 2.1% | |
| 1.1% 0.1% 0.1% 2.1% 0.5% | |
| 1.1% 0.1% 0.1% 2.1% 0.5% 1.1% | |
| 1.1% 0.1% 0.1% 0.5% 1.1% 0.1% | |
| 1.1% 0.1% 0.1% 2.1% 0.5% 1.1% 0.1% 0.3% | |
| 1.1% 0.1% 0.1% 2.1% 0.5% 1.1% 0.1% 0.3% 1.6% | |
| 1.1% 0.1% 0.1% 2.1% 0.5% 1.1% 0.1% 0.3% 1.6% 1.2% | |
| 1.1% 0.1% 0.1% 2.1% 0.5% 1.1% 0.1% 0.3% 1.6% 1.2% 0.3% | |
| 1.1% 0.1% 0.1% 2.1% 0.5% 1.1% 0.1% 0.3% 1.6% 1.2% 0.3% 0.3% | |
| 1.1% 0.1% 0.1% 2.1% 0.5% 1.1% 0.1% 0.3% 1.6% 1.2% 0.3% 0.1% 0.5% | |
| 1.1% 0.1% 0.1% 2.1% 0.5% 1.1% 0.1% 0.3% 1.6% 1.2% 0.3% 0.1% 0.5% 0.2% | |
| 1.1% 0.1% 0.1% 2.1% 0.5% 1.1% 0.1% 0.3% 1.2% 0.3% 0.1% 0.3% 0.1% 0.3% 0.1% 0.3% 0.1% 0.3% 0.2% 0.3% | |
| 1.1% 0.1% 0.1% 2.1% 0.5% 1.1% 0.3% 1.6% 1.2% 0.3% 0.1% 0.3% 0.1% 0.3% 0.1% 0.3% 0.1% 0.3% 0.1% 0.3% 0.4% | |
| 1.1% 0.1% 0.1% 0.5% 1.1% 0.3% 1.6% 1.2% 0.3% 0.1% 0.3% 0.1% 0.3% 0.1% 0.2% 0.3% 0.4% 0.1% | |

APPENDIX G Key Reporting Assumptions

This is an on-going process to improve alignment between the Annual Plan, the Annual Report and the TRM across a given Program year. As in previous Annual plans, the Total Resource Benefit table applicable to the given year is pictured below. Key Program reporting assumptions are listed for further reference in the PY18 Technical Reference Manual.

Figure G-1: PY18 Total Resource Benefit Values

| Demonstration TRB Values Using Modified Current EEPS Utility Avoided Cost | | | | | | | | | | | | | | | |
|---|--------|-------------------|-----------|------------|------------|----------|-------------------|-----------|----|--------------------------------|----|-----------|----|------------|--|
| | | | _ | | _ | | 1 | | | | | | | | |
| Di | | Discount | Factored | | Es | calation | | | | | | | | | |
| | | Rate | EEPS | | Rate | | | | | | | | | | |
| 6% | | | | 76% | | 3% | | | | | - | | | | |
| | | | Uti | lity Avoid | ed (| Costs* | NPV for each Year | | | NPV Cumulative From Final Year | | | | | |
| Year | Period | NPV Multiplier | \$/kW/yr. | | \$/kWh/yr. | | \$/ | \$/kW/yr. | | \$/kWh/yr. | | \$/kW/yr. | | \$/kWh/yr. | |
| 2018 | 1 | 1.00 | \$ | - | \$ | 0.176 | \$ | - | \$ | 0.176 | \$ | - | \$ | 0.176 | |
| 2019 | 2 | 0.94 | \$ | - | \$ | 0.181 | \$ | - | \$ | 0.171 | \$ | - | \$ | 0.347 | |
| 2020 | 3 | 0.89 | \$ | 904.0 | \$ | 0.187 | \$ | 805 | \$ | 0.166 | \$ | 805 | \$ | 0.513 | |
| 2021 | 4 | 0.84 | \$ | 986.0 | \$ | 0.192 | \$ | 828 | \$ | 0.161 | \$ | 1,633 | \$ | 0.674 | |
| 2022 | 5 | 0.79 | \$ | 856.0 | \$ | 0.198 | \$ | 678 | \$ | 0.157 | \$ | 2,311 | \$ | 0.831 | |
| 2023 | 6 | 0.75 | \$ | 750.0 | \$ | 0.204 | \$ | 560 | \$ | 0.152 | \$ | 2,871 | \$ | 0.983 | |
| 2024 | 7 | 0.70 | \$ | 663.0 | \$ | 0.210 | \$ | 467 | \$ | 0.148 | \$ | 3,338 | \$ | 1.131 | |
| 2025 | 8 | 0.67 | \$ | 590.0 | \$ | 0.216 | \$ | 392 | \$ | 0.144 | \$ | 3,730 | \$ | 1.275 | |
| 2026 | 9 | 0.63 | \$ | 527.0 | \$ | 0.223 | \$ | 331 | \$ | 0.140 | \$ | 4,061 | \$ | 1.415 | |
| 2027 | 10 | 0.59 | \$ | 474.0 | \$ | 0.230 | \$ | 281 | \$ | 0.136 | \$ | 4,342 | \$ | 1.551 | |
| 2028 | 11 | 0.56 | \$ | 1,020.0 | \$ | 0.236 | \$ | 570 | \$ | 0.132 | \$ | 4,912 | \$ | 1.683 | |
| 2029 | 12 | 0.53 | \$ | 1,066.0 | \$ | 0.244 | \$ | 562 | \$ | 0.128 | \$ | 5,474 | \$ | 1.811 | |
| 2030 | 13 | 0.50 | \$ | 964.0 | \$ | 0.251 | \$ | 479 | \$ | 0.125 | \$ | 5,953 | \$ | 1.936 | |
| 2031 | 14 | 0.47 | \$ | 875.0 | \$ | 0.258 | \$ | 410 | \$ | 0.121 | \$ | 6,363 | \$ | 2.057 | |
| 2032 | 15 | 0.44 | \$ | 795.0 | \$ | 0.266 | \$ | 352 | \$ | 0.118 | \$ | 6,715 | \$ | 2.175 | |
| 2033 | 16 | 0.42 | \$ | 724.0 | \$ | 0.274 | \$ | 302 | \$ | 0.114 | \$ | 7,017 | \$ | 2.289 | |
| 2034 | 17 | 0.39 | \$ | - | \$ | 0.282 | \$ | - | \$ | 0.111 | \$ | 7,017 | \$ | 2.400 | |
| 2035 | 18 | 0.37 | \$ | - | \$ | 0.291 | \$ | - | \$ | 0.108 | \$ | 7,017 | \$ | 2.508 | |
| 2036 | 19 | 0.35 | \$ | - | \$ | 0.300 | \$ | - | \$ | 0.105 | \$ | 7,017 | \$ | 2.613 | |
| 2037 | 20 | 0.33 | \$ | - | \$ | 0.308 | \$ | - | \$ | 0.102 | \$ | 7,017 | \$ | 2.715 | |
| 2038 | 21 | 0.31 | \$ | - | \$ | 0.318 | \$ | - | \$ | 0.099 | \$ | 7,017 | \$ | 2.814 | |
| 2039 | 22 | 0.29 | \$ | - | \$ | 0.327 | \$ | - | \$ | 0.096 | \$ | 7,017 | \$ | 2.910 | |
| 2040 | 23 | 0.28 | \$ | - | \$ | 0.337 | \$ | - | \$ | 0.094 | \$ | 7,017 | \$ | 3.004 | |
| 2041 | 24 | 0.26 | \$ | - | \$ | 0.347 | \$ | - | \$ | 0.091 | \$ | 7,017 | \$ | 3.095 | |
| 2042 | 25 | 0.25 | Ś | - | Ś | 0.358 | Ś | - | Ś | 0.088 | Ś | 7.017 | Ś | 3.183 | |

* EEPS (2013-0156) Avoided Capacity Cost factored by 76% to reflect contribution of kW reductions achieved on Oahu in PY13.

\$161/MWh Avoided Costs per Guidance Recommendations. This is a conservative estimate based on EEPS 2014 Projections of

192, 225 and 192/MWh for HECO, HELCO and MECO respectively.

Key calculations for program savings can be found in the PY18 TRM, as listed below.

Key Metrics

Avoided Costs Calculation & Development Total Resource Benefit Gross-to-Net Calculations System Loss Factor

Savings Factors

Effective Useful Life (EUL)

Interactive Factor

Persistence Factor

Commercial Lighting Hours of Operation & Coincidence Factor

APPENDIX H Program Logic Model: Codes & Standards

Program Logic Model: Codes & Standards

| | | Code Development | & Adoption | | Code Compliance | | | | | | |
|--|---|---|--|---|---|--|--|--|--|--|--|
| Inputs | Tranformational budg design, constru | get, Stakeholders (e.g. commur uction and engineering firms, (| nity organizers, realto county building depa | rs, building owners, artments, etc.) | Building industry | Architects, Engineers, construction designers | Planning & Permitting departments | | | | |
| Barriers | Lack of uniformity am | ong counties and a uniform pr and counties for adoption | ocess across state | Incomplete or limited knowledge of new code requirements | Drivers of non- compliance Drivers of non-enforcement | | | | | | |
| Activity Type | OutreachPromotion Advocacy | Stakeholder enga | agement | Resources and support | Compliance studies, ide department feed | entification of adequate back for non-compliar | ate and relevant training, industry and planning ance and non-enforcement, gap analysis | | | | |
| Action | Participate with SBCC and promote existing training opportunities | Advocate for enhanced code adoption with industry org groups and energy efficie | e development and ganizations, trade ency contractors | Lead EECC committee, develop & deploy resources for industry | Develop programs to improve areas of low compliance | Develop i | interventions to address feedback | | | | |
| Program Outputs | More proponents for energy codes | Facilitate energy code ac facilitate discussion around i adoption or | doption, address stak innovative energy co integration with Prog | eholder concerns, de practices for future gram | New collaborations national code organizations and other C&S programs | Engage key stakeholders to address gap analysis findings | | | | | |
| Short Term Outcomes | Widespread awareness of code & changes | Adoption of code enhanceme | ent proposals by Dep Permitting | artment of Planning & | Compliance study results used to inform planning efforts within the C&S sector | Widespread impact on current building construction pr | | | | | |
| Medium Term Outcomes | Widespread understanding and acceptance of code & new changes | New code pass | ed into law with amer | ndments | Measurable increase in code compliance | Design community and planning departments equipped with training, resources & tools to maximize code compliance and verification | | | | | |
| Long Term Outcomes | Legislative support for code from developers and plan reviewers | Code adopti | ion by all Hawai'i cou | inties | Energy savings realized and claimed toward Program resource acquisition | | | | | | |
| Approximate Program Activities Timeline | PY14 | PY15 | PY16 | PY17 | PY18 | | | | | | |
Hawai'i Energy Codes and Standards Activities



Codes & Standards logic model created for the PY18 Annual Plan illustrating thoughtful development of C&S program historically and informing future C&S intervention design. Timeline of Program energy code activities depicts evolution with the changing codes and standards landscape and is reflective of the codes and standards logic model historically.