EEPS TECHNICAL WORKING GROUP

June 6, 2023
1:00 p.m. to 4:30 p.m.

Hawai'i Energy Offices with Teams Web conference option

AGENDA

- 1:00 – Welcome & Meeting Objectives
- 1:15 – EE + DR Working Group Report Out
- 2:00 – TSB Working Group Report Out
- 2:35 – Break
- 2:50 – Equity Working Group Report Out
- 3:35 – Potential New EEPS Savings Sources
- 4:15 – 3rd EEPS Report to Legislature
- 4:30 – Wrap up & adjourn

WELCOME & MEETING OBJECTIVES

JENNIFER BARNES

ENERGY EFFICIENCY MANAGER TEAM

BACKGROUND

- There was proposed legislation (HB193) that would extend EEPS to 2045 and increase the target commensurately
  - The legislation was not passed in the 2023 legislative session
- HPUC was looking to TWG for recommendations on how to execute the proposed changes
- The February 9th TWG meeting participants identified three policy objectives that to explore:
  - Equity
  - Demand (peak demand reduction, demand response & demand flexibility)
  - Time and locational value of energy savings/total system benefit (TSB) metric

WORKING GROUP CHARTERS

The following three working groups were formed to explore the identified policy objectives:

Equity Working Group

- Develop a recommendation for whether/how to incorporate equity into the EEPS

EE + DR Working Group

- Develop a recommendation for whether/how to incorporate demand flexibility into the EEPS

TSB Working Group

- Develop a recommendation for whether/how to adopt a total system benefit (TSB) metric

The goal of each WG was to develop and present a recommendation to the full TWG in the June TWG meeting

Integrating w/ utility planning

Support 100% RE transition

Support the RPS goal of 100% by 2045

Peak Demand Reduction

-Related Grid Flexibility

Grid Benefits: resiliency & reliablity

increase the utilization of DR resources

Grid flexibility + demand reduction

energy equity/bill savings

Peak Demand Reduction

How do we define & measure demand flex metric & peak demand savings

Peak Demand Reductions

Demand Reduction

Grid Flexibility

- peak demand
- inc. capacity

Grid Flexibility

What is the role of EE to the grid now that there is more dyren(?)

Demand Flexibility

Grid Flexibility/ Demand Reduction

Grid Flexibility

- customer-sited generation
- utility-scale generation

Time & locational value of savings

time & loctional value of savings

time & locational value

particularly important given penetration of renewables

Time & locational value of savings/load shifting

Energy Equity

Many challenges still remain and are getting worse in HTR communities

Equity & Affordability

Bill Savings reductions/ lower energy costs

Energy Equity

Energy Equity

Energy Equity

Cost to administer is more expensive and needs to be considered

Ensure that DEI groups have opportunities

Bill savings/ Equity

Energy Equity

- Generation

Customer Bill Savings

- fuel reserves?
- stabilize cost

Energy equity- ensuring rural communities aren't left behind in the transition and the development in all the other priorities

	EE + DR WG	Equity WG	TSB WG
Members	Yoh Kawanami (HECO) Yvette Maskrey & Burk Gingerich (Honeywell) Caroline Carl (Hawai‘i Energy) Howard Wiig & Gail Suzuki-Jones (HSEO) Scott Sato (KIUC)	Beth Amaro (KIUC) Stephany Vaioletti (Hawai‘i Energy) Noelle Kakimoto & Kaiulani Shinsato (HECO) Sherilyn Hayashida & Dean Nishina (CA)	Brad Rockwell (KIUC) Vinh Ngo (Hawai‘i Energy) Jenn Baker (HECO)
WG Meetings	March 20, 2023 April 12, 2023 May 8, 2023 May 31, 2023	March 16, 2023 April 10, 2023 May 5, 2023 May 31, 2023	March 27, 2023 April 18, 2023 May 23, 2023

Special Guest Participant: Natalie Frick, LBNL

HPUC Attendees: Ashley Norman, Pete Polonsky & Eric Sippert

Additional Support from HECO Team: Therese Klaty, Chris Lau, Marc Asano

TODAY'S WORKSHOP OBJECTIVES

EEPS Targets

- Review & discuss each working group's recommendation for EEPS modifications
- Agree on the final recommendation to the HPUC

Other EEPS Savings Sources

- Begin to discuss upcoming activities that are eligible to be counted towards EEPS
- Identify next steps to determining whether it's feasible to capture/claim these savings

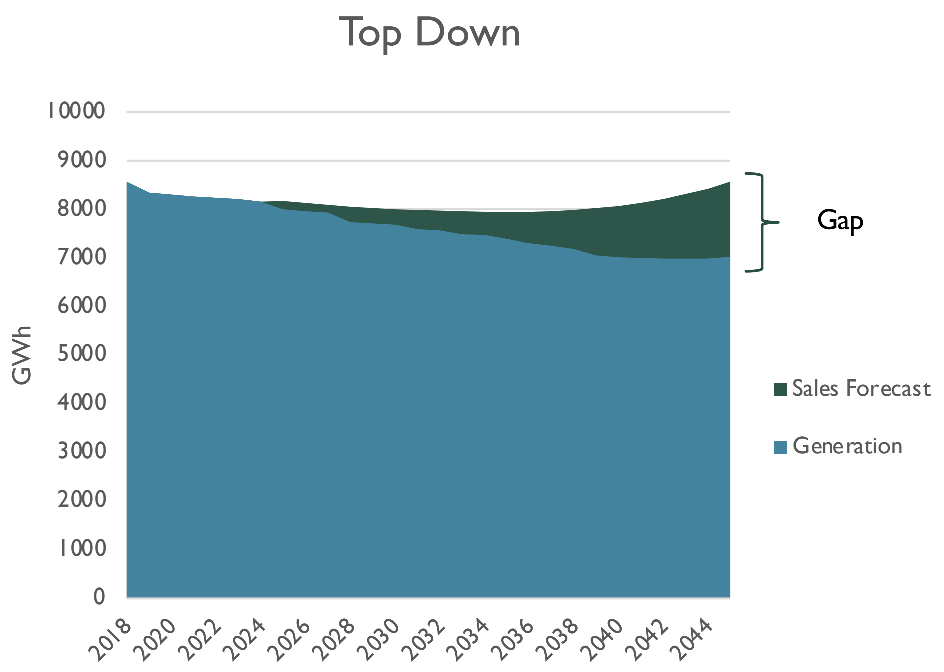
EE + DR WORKING GROUP REPORT OUT

JENNIFER BARNES

ENERGY EFFICIENCY MANAGER TEAM

TOP-DOWN GOAL

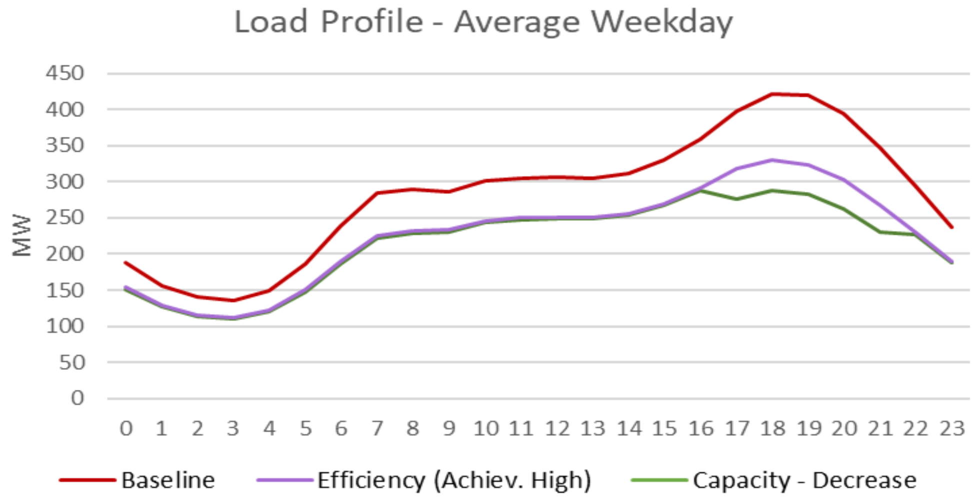
- Example
  - Future incremental goal aligns with the gap between sales and generation
- Data
  - AEG confirmed that the data for the sales forecast is available on the IGP Working Group Website
    - Annual and hourly data in MW
  - Generation forecast is available in annual MW
  - Need to work with HECO to get generation data into an annual sales (MWH) format
- Analysis
  - Actual analysis should be relatively simple and data is already available from the IGP
  - Need to compare to the potential assessment to understand alignment

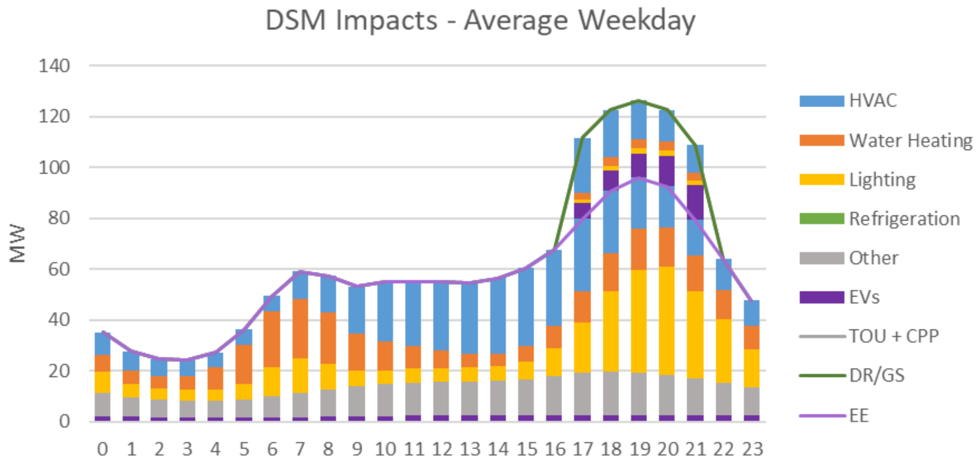


DEFINING DEMAND

- We are using "demand" here instead of demand response (DR) because we believe it is more appropriate for EEPS
  - There are opportunities to add a demand reduction goal
  - Demand is most aligned with energy
- We have defined the demand impact as the peak demand period, as follows
  - Average MW impact from 5-9 pm on an average weekday
- EE and DR (capacity decrease) can contribute to demand impact
  - EE is not flexible
  - DR is flexible and dispatchable

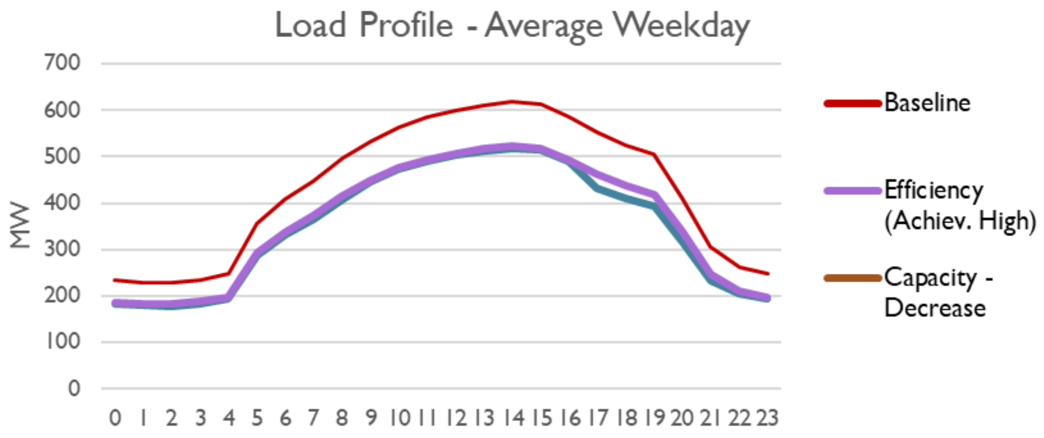
RESIDENTIAL DEMAND POTENTIAL -2030

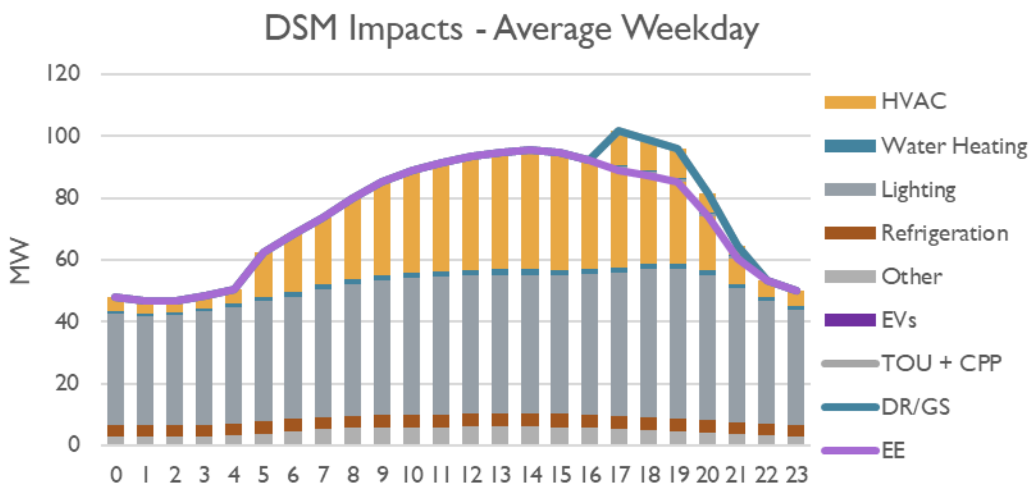




- 22% impact from EE during the on-peak window
  - Average of 88 MW (5-9 pm)
  - Lighting, Water Heat, HVAC largest contributors
    - EISA changes will remove lighting from the picture
      - ~34 MW or 40% of the impact
- 7% impact from DR/Flexible loads during the on-peak
  - Average of 31 MW (5-9 pm)
  - HVAC and EV's are the largest contributors

C&I DEMAND POTENTIAL -2030



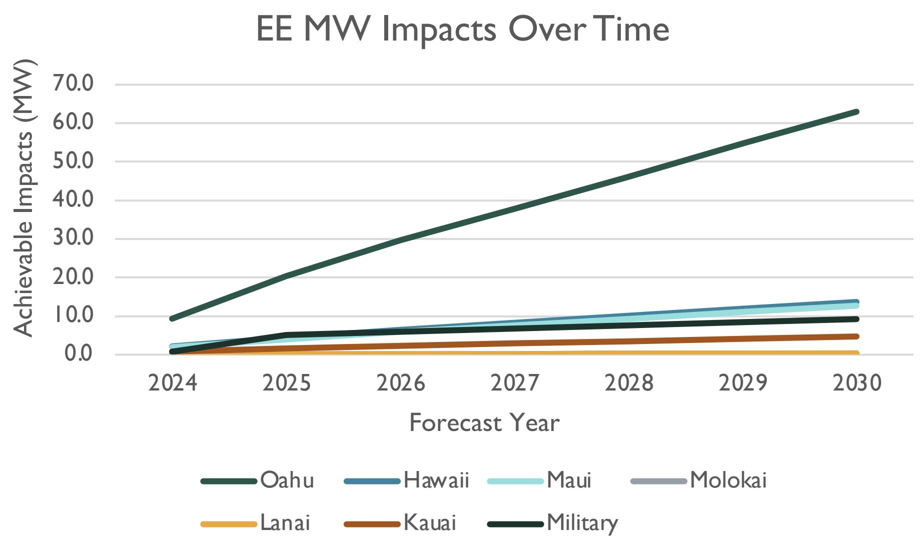


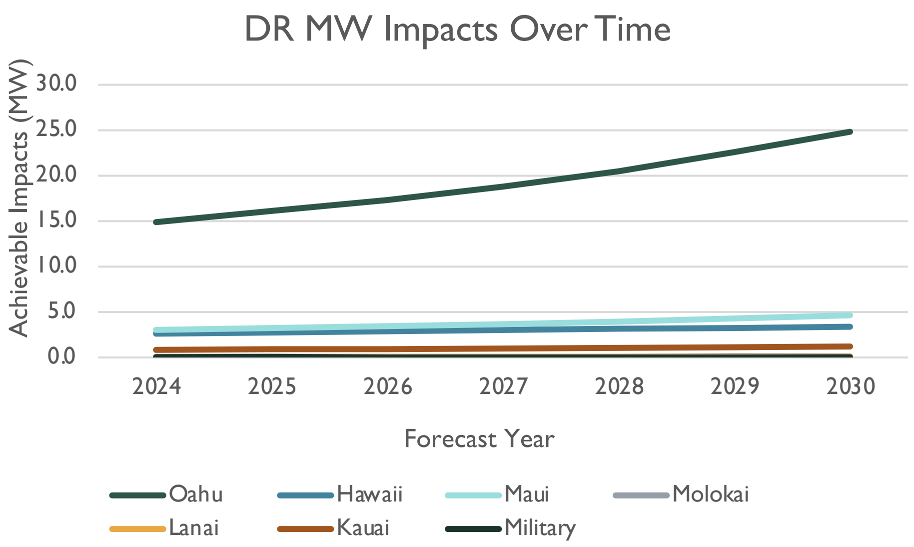
- 17% impact from EE during the on-peak window
  - Average of 79 MW
  - Lighting, HVAC largest contributors
- 2% impact from DR/Flexible loads during the on-peak
  - Average of 9 MW
  - HVAC & Water Heating are the largest contributors

DEVELOPING ISLAND-LEVEL GOALS

- Used the hourly MPS impact data for the Capacity Decrease and Achievable High Scenario
  - This analysis only extends to 2030
- Assumptions include
  - Demand impact = Average MW impact from 5-9 pm on an average weekday
  - Achievable High derated by a factor of 0.70
    - Represents the ratio of Achievable BAU to Achievable High in 2030
  - Removed all Residential Lighting impacts using an additional factor of 0.87
    - Represents the proportion of savings attributable to residential lighting in 2030
  - DR is represented by capacity decrease impacts only
  - EE demand impacts are in cumulative persisting demand beginning in 2024
  - DR impacts are not persisting

EE & DR IMPACTS BY ISLAND OVER TIME





HE PY21 1st Year demand was 17 MW
2024 1st year demand estimate is 15 MW

2030 ISLAND-LEVEL POTENTIAL

Island	EE Impact	% of Baseline	DR Impact	% of Baseline
Oahu	63.0	8%	24.8	3%
Hawaii	13.7	8%	3.4	2%
Maui	12.7	8%	4.6	3%
Molokai	0.3	8%	0.1	3%
Lanai	0.3	8%	0.1	2%
Kauai	4.7	7%	1.2	2%
Military	9.2	7%	0.0	0%

- Impacts are in annual MWs and include residential, commercial & industrial customers
- DR impact represents savings from capacity decrease DR, of which flexible load EE measures are a subset (e.g., smart thermostats, grid-interactive water heaters, managed EV charging)
- Estimates are through 2030 only; values to 2045 will need to be developed through an MPS update

PEAK DEMAND REDUCTION TARGET RECOMMENDATION

Island	2030 Peak Demand Target (Annual MW)
Oahu	88
Hawaii	17
Maui	17
Molokai	0
Lanai	0
Kauai	6
Military	9

- Current EEPS Legislation
  - The energy-efficiency portfolio standards shall be designed to achieve four thousand three hundred gigawatt hours of cumulative persisting electricity savings statewide by 2030
- Peak Demand Reduction Target Recommendation
  - In addition, cumulative persisting 2030 peak demand targets are set for each island. Island targets include residential, commercial, and industrial customers.
  - The peak demand targets can be met through a combination of energy efficiency measures and capacity decrease demand response including efficiency measures that support load flexibility
  - Eligible capacity decrease demand response and efficiency measures that support load flexibility must be capable of providing a minimum of 2 hours of load shifting/curtailment

PROS & CONS

Strengths

- Demand reductions through EE, DR & flexible load will directly support RPS goal
- Will provide flexibility in execution since goal can be met through EE, DR & flexible load
- All data is already being captured/tracked
- Could add/call out other eligible contributors in the future (i.e., managed EV charging)

Weaknesses

- Adds an additional layer of complexity to EEPS reporting
- Will need to work with HECO to report capacity decrease DR accomplishments

TSB WORKING GROUP REPORT OUT

KELLY MARRIN

APPLIED ENERGY GROUP

TOTAL SYSTEM BENEFIT DEFINED

- Total system benefit (TSB) is an expression, in dollar terms, of the lifecycle energy, capacity, and GHG benefits, expressed on an annual basis
  - Represents the total benefits, or "avoided costs," that a measure provides to the electric and natural gas systems
- Calculated by multiplying the DER load shape by the hourly avoided costs through the DER's effective life
  - For EE measures, TSB is the sum of the product of the measure's load shape and avoided cost, through the measure's lifetime
  - For a DR event, TSB is equal to the product of the load shape of the event and the applicable avoided costs
  - The TSB formula can be applied to distributed generation, storage, and other DERs
- To the extent the avoided costs account for the various benefits of energy savings across time, the TSB will capture all the system benefits of the DER

Annual measure energy savings * Measure load shape * 8760 hourly avoided costs * Measure life

WHAT ADVANTAGES DOES TSB CAPTURE?

The value of energy varies with:

- ***Time:*** reducing energy use in the late afternoon and evening is more valuable than saving at noon because there is adequate solar resource at noon but these solar arrays power down and more costly and polluting resources power up
- ***Season:*** cooling loads in hotter months require more resources than in cooler months
- ***Location:*** some locations have more/adequate resources while others are constrained
- ***Measure lifetime***: longer life measures deliver more benefits that shorter life measures with the same annual energy savings

TSB captures the full suite of policy benefits that DERs provide (to the extent they are captured in the avoided costs)

Can provide a common unit of valuation to compare all DERs

EXAMPLE: SYSTEM BENEFITS COMPARISON FROM CALIFORNIA

This slide shows how energy savings and system benefits can vary dramatically using the same measure mix

Filing ID	Measure Application	TRC	Scenario 1			Scenario 2			Scenario 3		
			Quantity	Annual Energy Savings	Benefits	Quantity	Annual Energy Savings	Benefits	Quantity	Annual Energy Savings	Benefits
SCE-2020-001121	Residential Smart Thermostat Heat Pump	1.97	55	8,350	$ 6,533	1	152	$ 119	260	39,471	$ 30,884
SCE-2020-001108	Faucet- Kitchen Aerator- 1.5 gpm- electric-AR	10.35	61	8,243	$ 4,096	1	135	$ 67	40	5,405	$ 2,686
SCE-2020-001106	Efficient Showerhead- Electric- 1.25 gpm	3.62	57	8,254	$ 3,823	1	145	$ 67	40	5,792	$ 2,683
SCE-2020-001252	Faucet- Kitchen Aerator- 1.5 gpm- electric-AR	17.38	52	8,431	$ 4,189	1	162	$ 81	40	6,485	$ 3,223
SCE-2020-001037	Interior LED Lighting - To-Standard Practice interior	2.67	8000	8,000	$ 3,073	16600	16,600	$ 6,376	40	40	$ 15
SCE-2020-001440	2 x 4 LED New Luminaire rated greater than or equal to 125 LPW and < 140 LPW	1.36	1040	8,497	$ 7,880	1	8	$ 8	5200	42,484	$ 39,400
SCE-2020-001401	(1) 48in T8 Lamp LED replacing (1) 48in T8 Linear Fluorescent	1.47	449	10,776	$ 2,897	1	24	$ 6	40	960	$ 258
SCE-2020-001009	Interior LED Lighting - To-Standard Practice Interior	2.84	8000	8,000	$ 3,075	16600	16,600	$ 6,381	36	36	$ 14
SCE-2020-001031	Agricultural pump system overhaul - retrocommissioning	1.18	8000	8,000	$ 1,048	16600	16,600	$ 2,175	40	40	$ 5
SCE-2020-001194	Process Motor - VFD	1.41	8000	8,000	$ 1,542	16600	16,600	$ 3,200	40	40	$ 8
SCE-2020-001150	HVAC - energy management system (EMS)	1.93	8000	8,000	$ 1,542	16500	16,500	$ 3,181	40	40	$ 8
SCE-2020-001144	Economizer - air side	1.24	8000	8,000	$ 1,542	16500	16,500	$ 3,181	40	40	$ 8
Total			49,714	100,550	$ 41,241	99,406	100,026	$ 24,841	5,856	100,833	$ 79,191

Source: *The Electricity Journal* 35 (2022) 107192. Mohit Chhabra, NRDC.

TSB BENEFITS

- Would tie the goals for the program administrators (Hawai‘i Energy and KIUC) directly to the avoided cost value of the EE savings
- Send program administrators a better signal of which types of efficiency programs should be pursued and encourages them to orient their program offerings to resources that will reduce energy during the most valuable hours of the day in order to deliver the highest value
- Accounting of system benefits on an hourly basis supports the integration of demand-side solutions
- Moves EE portfolios towards their true value as demand flexibility resources that the grid needs

DATA REVIEW AND ANALYSIS

DATA NECESSARY TO CALCULATE TSB

- The usefulness of TSB is a function of the robustness of its inputs
- Measure characteristics:
  - Measure energy savings (annual)
  - Measure load shape
  - Measure life
- Utility avoided costs:
  - Avoided value energy, capacity, and carbon emissions
  - Varying by time and location

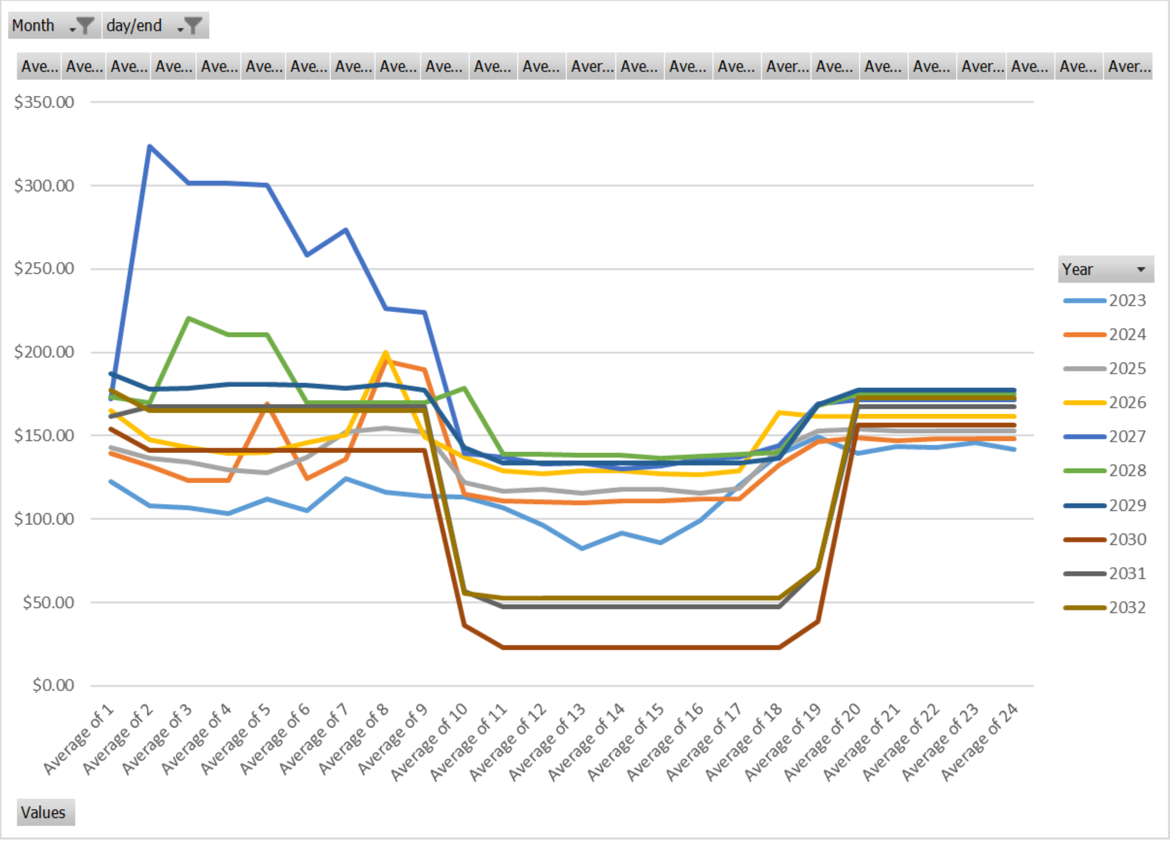
HECO DATA PROVIDED

- HECO provided 10-year forecast of several different types of avoided costs
  - Annual avoided energy costs (IGP filing)
  - Annual avoided capacity costs (IGP filing)
  - Hourly incremental (marginal) capacity costs from PLEXOS model
- Hourly Costs
  - Represent the cost to procure or produce the next MW of generation at each hour of the year
  - Provided by Island
  - Did have gaps that result from times when the modeling violates the parameters of the model

ANALYSIS OF HOURLY COST DATA

- AEG Summarized the Hourly data into 24 day-types
  - Weekdays and non-Weekdays
  - Months of the year
  - Helped to eliminate issues with gaps in data
- Data looks as we would expect – following the Duck Curve
- Shows variation across months of the year
- Shows variation across years
- There is potential to develop a TSB metric

February Weekday Marginal Load Shape Example



Hour of the Day

PY21 HAWAI'I ENERGY ACCOMPLISHMENTS IN TSB APPROACH

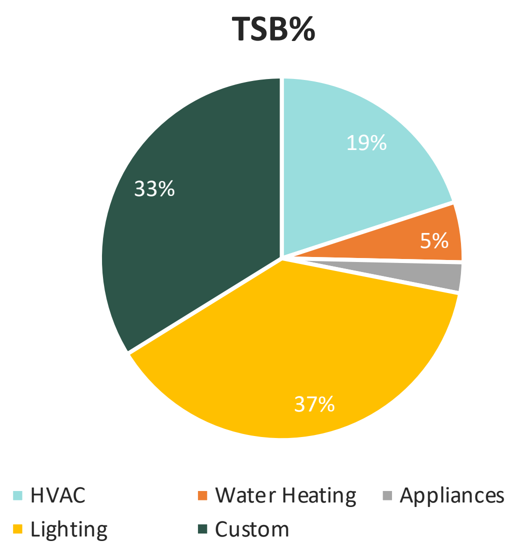
- Mapped PY21 measures and savings to TRM measure categories
- Mapped TRM measure categories to MPS load shape library
- Multiplied annual savings (including dual-baselines where appropriate) by unitized load shapes to develop 8760 savings estimates for each year of the measure life
  - Used weighted average measure lives when needed
- Expand the 24 hourly avoided cost day-types to an 8760 avoided cost
- Multiply avoided costs by savings
- Calculate the net present value of the annual stream
- Compare % contribution based on TSB, Annual kWh, and Lifetime kWh

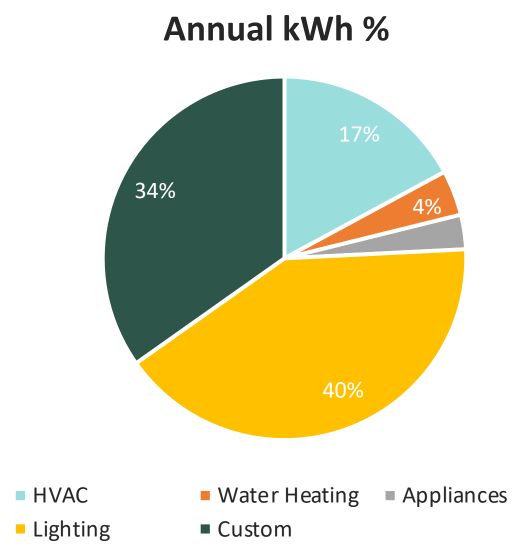
RESULTS SUMMARY

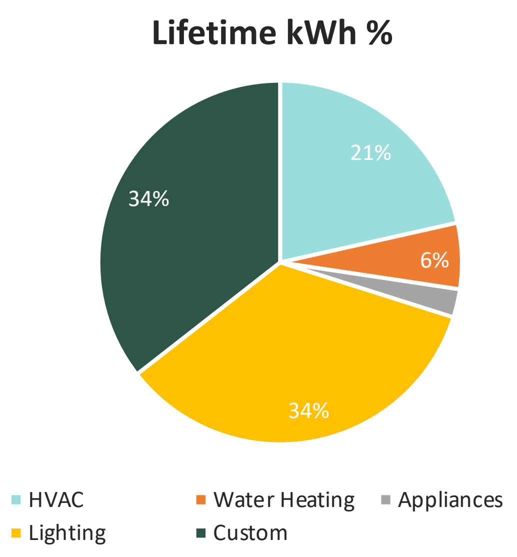
- Total TSB for the 2021 Portfolio is **$198,927,695**
  - Total annual kWh is **133,179,074**
  - Total Lifetime kWh **1,482,816,256**
- Relative contribution comparisons are not dramatically different based on the current portfolio
  - Vary by < 6% across metrics at the sector and measure level
  - Sensitivities, i.e., a variance of counts per measure, could yield larger changes

HIGH-LEVEL CONTRIBUTIONS – MAJOR MEASURES

All Islands & All Sectors







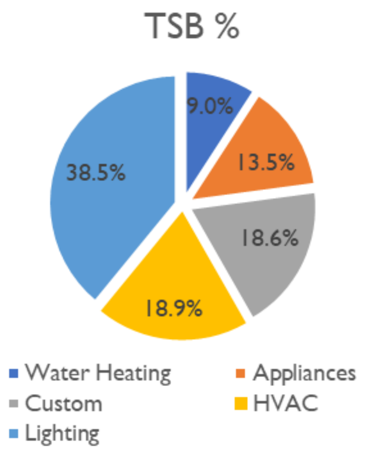
MAJOR MEASURES DETAILS

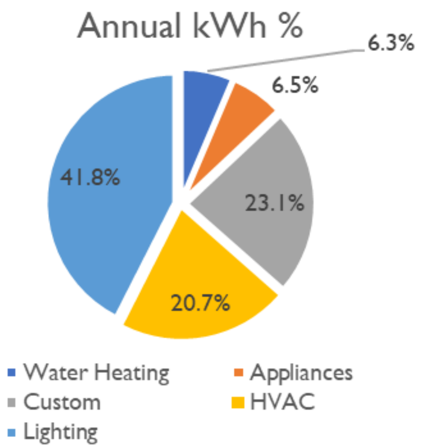
All islands & all sectors

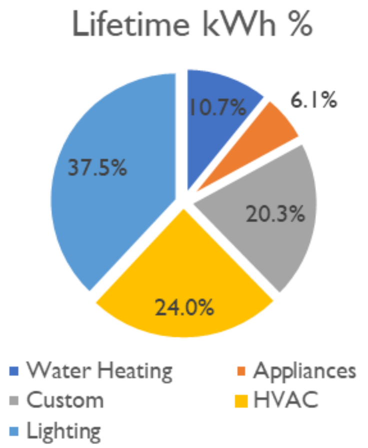
Category	Total TSB	Annual kWh	Lifetime kWh	TSB%	Annual kWh %	Lifetime kWh %
HVAC	$38,553,339	22,066,108	309,233,762	19%	17%	21%
Plug & Process	$351,887	472,227	2,361,133	0%	0%	0%
Water Heating	$10,347,313	5,190,656	84,565,595	5%	4%	6%
Appliances	$5,282,250	3,951,686	36,229,631	3%	3%	2%
Commercial Kitchen	$421,298	264,648	3,279,017	0%	0%	0%
Lighting	$73,447,430	52,862,969	497,382,584	37%	40%	34%
Custom	$65,232,784	44,865,678	511,566,239	33%	34%	34%
Pumps & Motors	$2,909,998	1,608,064	21,862,898	1%	1%	1%
Refrigeration	$117,849	98,063	1,470,948	0%	0%	0%
Electronics	$52,322	61,557	308,976	0%	0%	0%
Submetering	$1,816,341	1,409,354	11,274,834	1%	1%	1%
Building Envelope	$394,884	328,064	3,280,639	0%	0%	0%
Total	**$198,927,695**	**133,179,074**	**1,482,816,256**	**100%**	**100%**	**100%**

OAHU RESIDENTIAL DETAILS

Category	Total TSB	Annual kWh	Lifetime kWh	TSB %	Annual kWh %	Lifetime kWh %
Plug & Process	$193,688	245,263	1,226,314	0.3%	0.6%	0.3%
Water Heating	$5,176,252	2,710,271	43,567,909	9.0%	6.3%	10.7%
Appliances	$7,735,489	2,779,844	24,948,111	13.5%	6.5%	6.1%
Custom	$10,642,969	9,926,066	82,672,195	18.6%	23.1%	20.3%
HVAC	$10,825,635	8,869,766	97,406,997	18.9%	20.7%	24.0%
Lighting	$22,049,483	17,955,591	152,585,864	38.5%	41.8%	37.5%
Electronics	$113,219	55,907	277,108	0.2%	0.1%	0.1%
Pumps & Motors	$497,582	401,776	4,017,763	0.9%	0.9%	1.0%
Total	**$57,234,317**	**42,944,484**	**406,702,261**	**100%**	**100%**	**100%**

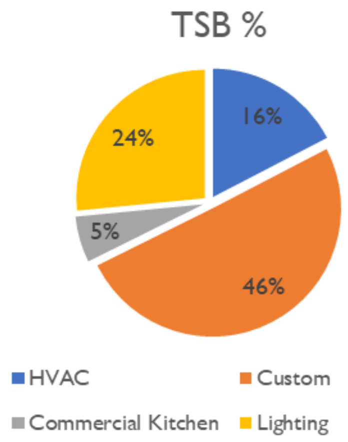


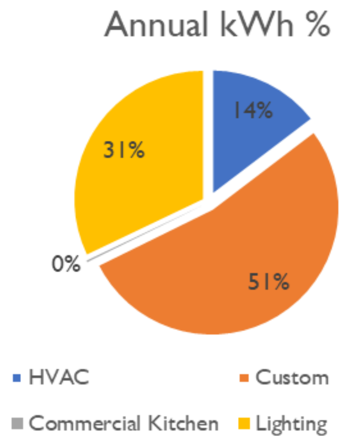


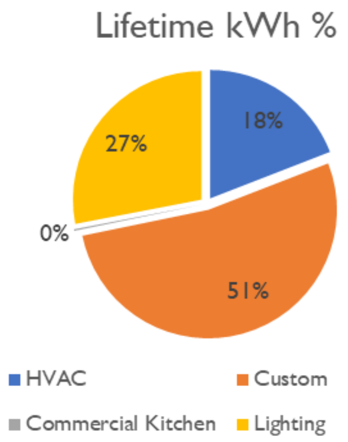


OAHU COMMERCIAL DETAILS

Category	Total TSB	Annual kWh	Lifetime kWh	TSB %	Annual kWh %	Lifetime kWh %
HVAC	$13,316,294	8,121,146	133,227,589	16%	14%	18%
Plug & Process	$377,538	64,370	321,850	0%	0%	0%
Water Heating	$676,042	199,096	3,581,070	1%	0%	0%
Custom	$38,558,592	29,454,572	367,278,975	46%	51%	51%
Commercial Kitchen	$4,447,000	109,797	1,368,955	5%	0%	0%
Pumps & Motors	$2,039,495	818,210	12,273,152	2%	1%	2%
Lighting	$20,344,543	17,802,691	195,524,255	24%	31%	27%
Appliances	$377,758	123,967	1,041,876	0%	0%	0%
Submetering	$2,665,544	1,040,720	8,325,759	3%	2%	1%
Building Envelope	$375,388	328,064	3,280,639	0%	0%	0%
Total	**$83,178,192**	**58,062,633**	**726,224,119**	**100%**	**100%**	**100%**







OBSERVATIONS & RECOMMENDATION

INITIAL OBSERVATIONS

- Primary benefits to using a TSB structure are that, when using robust avoided costs, it can drive investments that align with policy goals

- Not able to use the data as 8760 but can use at day-type level
  - Would need to assess whether using it at a day-type level is beneficial
  - The more the data is aggregated, you lose the variation
  - All we're getting is the time value; we'll get this from the demand recommendation in the EE + DR WG.
  - Geographic diversity is by island
- Adding complexity to something that may not need that much complexity
- Only goes to 2032 so it doesn't support EEPS to 2045
- Doesn't include GHG impacts

RECOMMENDATION

- The TSB working group recommends that the Commission (via the TWG) continue to explore the value of adopting a TSB metric in the future
- Specifically:
  - The TWG should monitor the robustness of the hourly data in future IGP updates
  - Conduct analysis on available data to determine whether the data allow for the use of hourly costs instead of day types
- Assess the level of effort to add in GHG impacts to the hourly values and the impact that the addition of GHG avoided costs have on the hourly values and the resulting portfolio decision drivers

EQUITY WORKING GROUP REPORT OUT

JENNIFER BARNES

ENERGY EFFICIENCY MANAGER TEAM

DEFINING LMI

- MPS Assumptions:
  - low-to-moderate-income was defined using the 2019 Housing and Urban Development (HUD) threshold for household income by family size and island

[20] The values used represent 80% of median income for a given household size and are identified below:

HH Size	Honolulu	Maui	Hawaii
1	$67,500	$54,700	$44,000
2	$77,150	$62,500	$50,250
3	$86,800	$70,300	$56,550
4	$96,400	$78,100	$62,800
5	$104,150	$84,350	$67,850
6	$111,850	$90,600	$72,850
7	$119,550	$96,850	$77,900
8	$127,250	$103,100	$82,900

- Justice 40 Disadvantages Community Definition:
  - A geographically dispersed set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions such as: poverty, high unemployment, air and water pollution, presence of hazardous wastes as well as high incidence of asthma and heart disease.

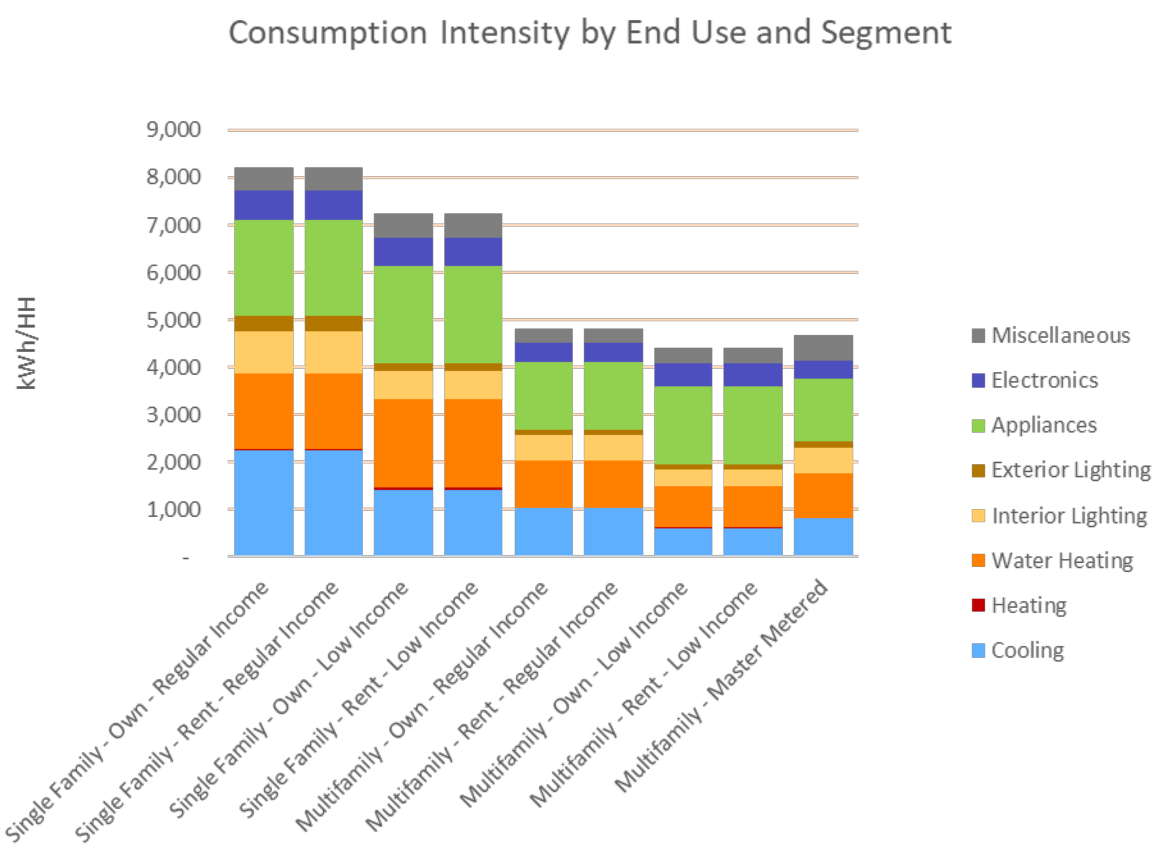
- LIHEAP Definition:
  - Applicants must be at or below 60% of the State Median Income and have an active utility account. Regardless of income, the household qualifies if there is at least one person in the household that receives SNAP (Food Stamps) or SSI.

- SNAP Definitions:

SNAP GROSS INCOME STANDARDS (Effective 10/1/2022)

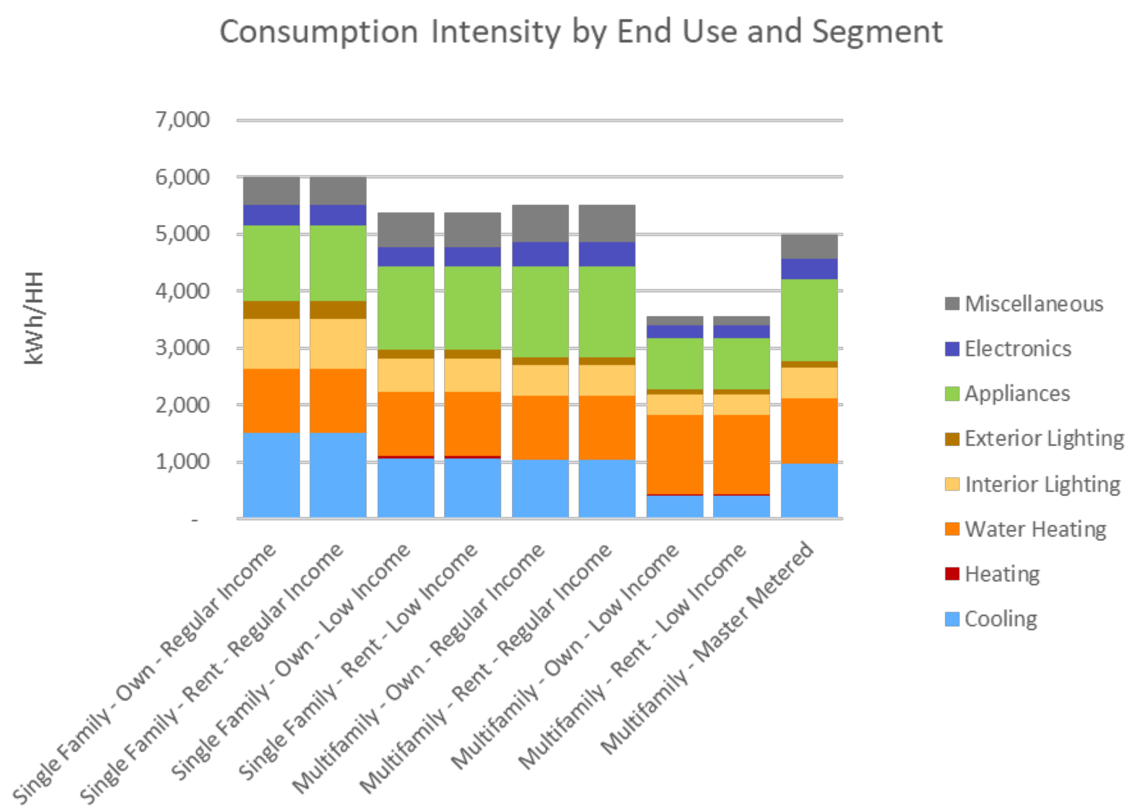
Household Size	200% Monthly Gross Income (BBCE Household)	130% Monthly Gross Income (Regular Household)	100% Monthly Net Income
1	2606	1694	1303
2	3510	2282	1755
3	4416	2870	2208
4	5320	3458	2660
5	6226	4047	3113
6	7130	4635	3565
7	8036	5223	4018
8	8940	5811	4470

RESIDENTIAL CHARACTERIZATION - OAHU



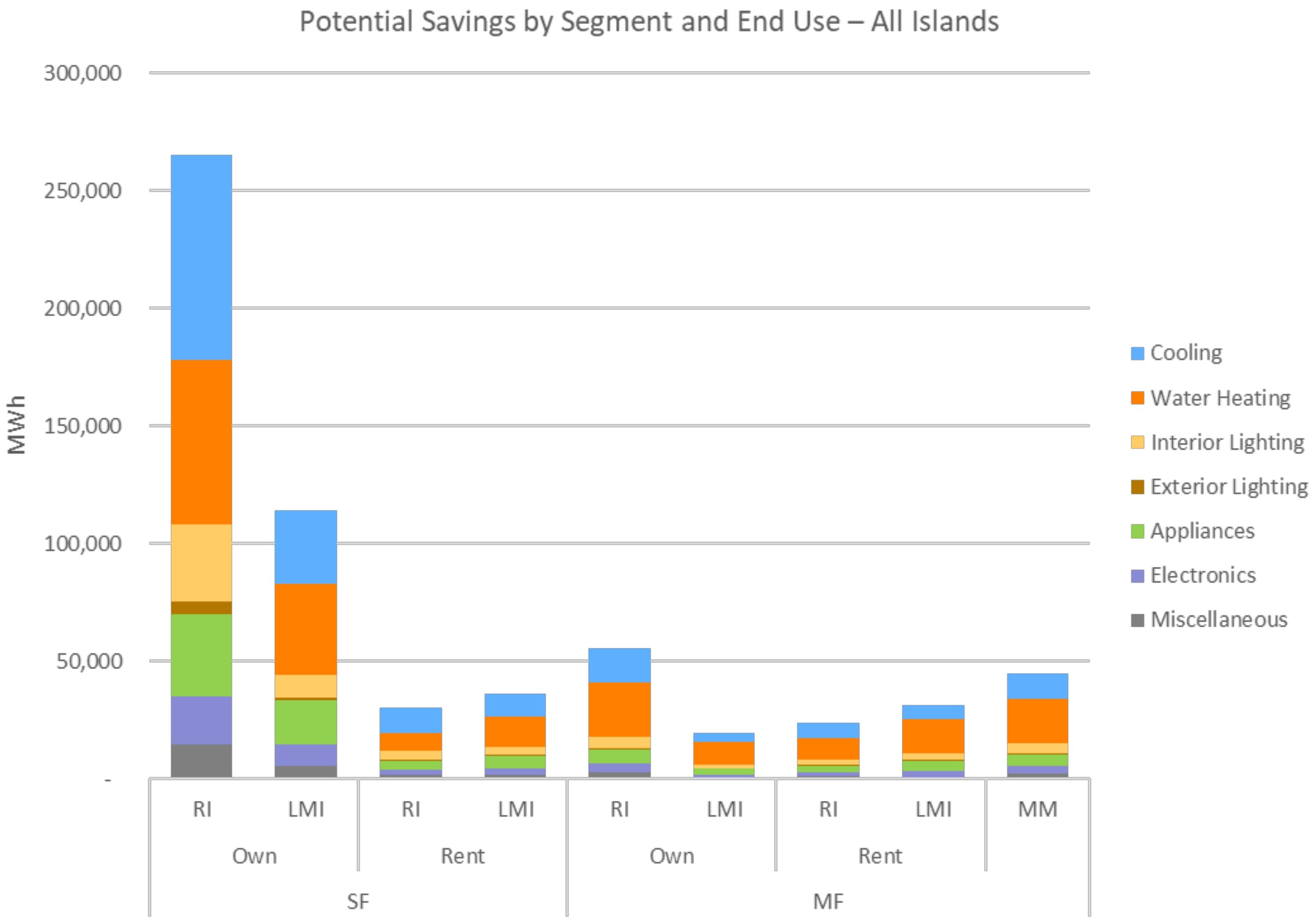
- Differences between RI and LMI:
  - Lower presence of cooling equipment in LMI
    - Ductless split systems are still majority for both RI and LMI
  - Slightly more water heater use due to less penetration of solar WH
    - Units also tend to be smaller – SWH requires a larger tank
  - Low-income single family more likely to have space heating (12% of homes vs ~2% for most others)
  - Lighting loads in LMI are smaller as a function of fewer lamps per home, but portion of lighting that is LED is similar

RESIDENTIAL CHARACTERIZATION – HAWAII ISLAND



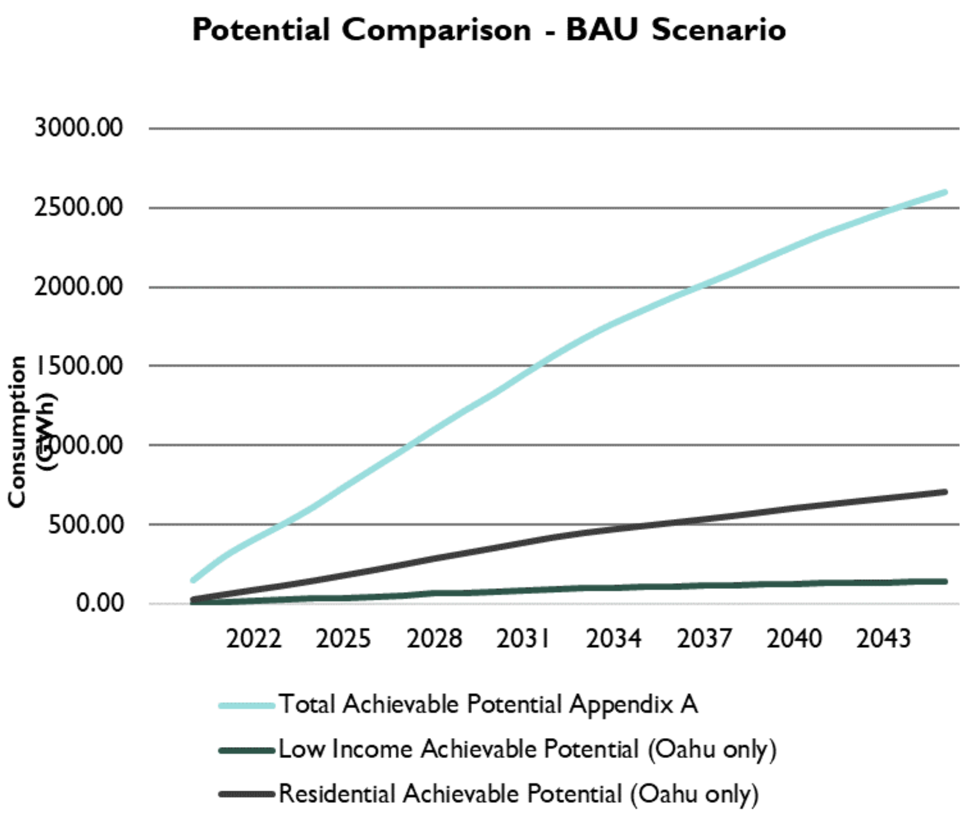
- Differences between RI and LMI:
  - Lower presence of cooling equipment in LMI, particularly in multifamily
    - Ductless split systems are still majority for both RI and LMI
  - Slightly more water heater use due to less penetration of solar WH
    - Units also tend to be smaller – SWH requires a larger tank
  - Lighting loads in LMI are smaller as a function of fewer lamps per home, but portion of lighting that is LED is similar
  - Multifamily LI also has lower presence of appliances

DIFFERENCES IN POTENTIAL



- Potential is proportional to base loads
- Differences in savings totals are due to presence of equipment and baseline UECs noted on previous slides

LMI POTENTIAL VS. ACHIEVABLE POTENTIAL

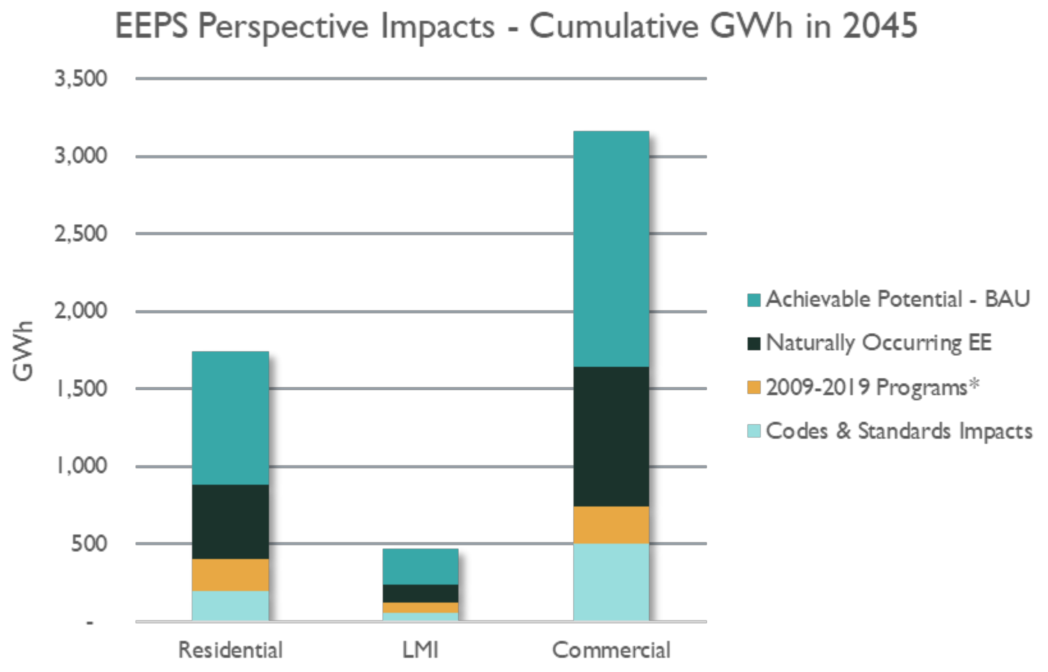


	2020	2025	2030	2035	2040	2045
Total Achievable Potential Appendix A	149	736	1,329	1,858	2,262	2,602
Residential Achievable Potential	30	182	354	495	606	709
Low Income Achievable Potential	6	40	79	108	127	143
Low income as a % of Residential	20%	22%	22%	22%	21%	20%
Low income as a % of Total	4%	5%	6%	6%	6%	6%

- LMI achievable potential is:
  - 20% of total Residential potential
  - 6% of total State level potential
    - FYI High Achievable is only 8% of State level

LMI POTENTIAL EEPS VIEW - 2045

EEPS Layer	Non-LMI Residential	LMI Residential	Comm.	Total
Codes & Standards Impacts	198	**56**	499	753
2009-2019 Programs	208	**67**	241	515
Naturally Occurring EE	480	**118**	907	1,505
Achievable Potential - BAU	855	**226**	1,521	2,602
Total	1,740	**467**	3,168	5,375
Percent of Total	32%	**9%**	59%	



DISCUSSION

- EEPS Legislation
  - The energy-efficiency portfolio standards shall be designed to achieve four thousand three hundred gigawatt hours of <u>cumulative persisting</u> electricity savings statewide by 2030
- Potential Recommendation
  - Residential single and multifamily LMI customers should contribute no less than 9% of the total statewide EEPS savings
- LMI Definition
  - The LMI definition to be developed by the Hawaii PUC within the Energy Equity and Justice Docket (No. 2022-0250)

- Strengths
  - Tied to data supported by the MPS
  - Can potentially be applied across contributing entities vs. budgets which effectively limits to PBFA and KIUC
  - HE BHTR & RHTR is ~30% of the budget
  - HE BHTR & RHTR is ~15% of first year savings
- Weaknesses
  - Leaves out business customers
  - For practical purposes program definitions may not align with LMI target
    - i.e., LMI and HTR might be different
  - Income eligibility can be challenging

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COMBINED RECOMMENDATION

COMBINED RECOMMENDATION

- EEPS Legislation
  - The energy-efficiency portfolio standards shall be designed to achieve four thousand three hundred gigawatt hours of cumulative persisting electricity savings statewide by 2030
- Equity Target Recommendation
  - Residential single and multifamily LMI customers should contribute no less than 9% of the total statewide EEPS savings
  - The definition of LMI shall be developed by the Hawaii PUC within the Energy Equity and Justice Docket (No. 2022-0250)
- Peak Demand Reduction Target Recommendation
  - In addition, cumulative persisting 2030 peak demand targets are set for each island. Island targets include residential, commercial, and industrial customers.
  - The peak demand targets can be met through a combination of energy efficiency measures and capacity decrease demand response including efficiency measures that support load flexibility
  - Eligible capacity decrease demand response and efficiency measures that support load flexibility must be capable of providing a minimum of 2 hours of load shifting/curtailment

Island	2030Peak Demand Target (Annual MW)
Oahu	88
Hawaii	17
Maui	17
Molokai	0
Lanai	0
Kauai	6
Military	9

ADDITIONAL/SUPPORTING DETAILS

TWG recommendation will include the following:

- Any updated legislation should include language that supports:
  - The equitable achievement of savings across low income and other hard-to-reach groups
  - Peak demand reductions and demand flexibility
- However, the subtargets and other details will be memorialized in the EEPS Framework:
  - This will allow the Commission to update the target values
  - Equity and peak demand subtargets can be added to the Framework to support the current 2030 EEPS target
- The TWG will review updates to the MPS and other sources and recommend updates, when needed

POTENTIAL NEW EEPS SAVINGS SOURCES

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ENERGY EFFICIENCY MANAGER TEAM

SOURCES OF SAVINGS FROM EEPS FRAMEWORK

The EEPS Framework includes a variety of potential savings source

To date, EEPS savings have primarily come from PBFA and KIUC program savings

Two new efforts may generate eligible savings in the future:

- HECO TOU Pilot
- City & County of Honolulu Benchmarking Program

c) Legislative Mandates

State building retrofits, time of sale reporting, energy service contracts and mandatory benchmarking are all examples of legislative mandates that may provide savings at a low cost. These concepts are referenced in Act 155 and should be utilized to the extent possible.

d) Support of benchmarking or time of sale energy scores for commercial buildings.

b) Other Utility Programs

Utility delivered programs such as rate design or advanced metering may also contribute to EEPS.

HECO TOU PILOT

PETER YOUNG
HAWAIIAN ELECTRIC

Hawaiian Electric

Time-of-Use ("TOU") Rates

PBF Technical Advisory Group Meeting

June 7, 2023

WHY TOU? PUC Guidance from November 2020

- Desired End State: TOU rates for residential and commercial customers, on an opt-out basis
  - Gradual implementation of TOU rates

- Policy goals
  - Improve grid resilience
  - Promote reliability
  - Reduce environmental impacts
  - Provide cost savings to customers
  - Provide customers the opportunity to better influence and control their bills

Approved Rate Design – The Basics

- Customer Charge: fixed monthly amount to recover customer-specific metering and billing costs
- Grid Access Charge: $ per kW charge to recover customer-related service connection costs
- TOU Energy Charges
  - Recover all other costs, including generation, transmission, distribution
  - Recover surcharges including Energy Cost Recovery, Purchase Power Adjustment, IRP Cost Recovery

More on TOU Energy Charges

- Three daily TOU periods
  - Daytime: 9am – 5pm
  - Overnight: 9pm – 9am
  - Evening Peak: 5pm – 9pm
- Ratio of TOU Energy rates is 1:2:3 for D:O:E periods
- TOU block energy prices shall be adjusted annually. This adjustment will incorporate any cumulative adjustments and reconciliations of applicable surcharges such as the ECRC, PPAC, and IRP.

Other Features

- RBA Rate Adjustment applied as a percentage of bill (excluding Energy Cost Recovery) instead of per kWh.   Effective June 1, 2023 for all customers.
- Existing TOU rate options for Schedule R, G, and J rates are immediately closed to new customers. Will terminate 12 months after TOU rates are implemented
- Bill protection for Schedule R customers on TOU rates for six months. Caps TOU bill increase over Schedule R bill at $10
- Bill protection for Schedule G and J customers on TOU rates for six months. Caps TOU bill increase over regular rate at 4%.
- New bill form for TOU customers

Who gets TOU Rates?

- The Company will rollout TOU rates on July 1, 2023, via selection of customers to a TOU Study.   One year study period.
  - A statistically significant sample of customers who have had AMI installed for a minimum of six months, including DER customers.
  - Will be a small fraction of customers who have AMI meters
  - Estimated 15,000 Schedule R customers; 1,700 Schedule G and Schedule J customers

- Schedule R, G, and J customers not selected for the TOU Study may opt-in to TOU rates

- Customers participating in the TOU Study shall have the option leave the TOU Study altogether and go back onto Schedule R, G, or J rates.

Proposed Rates Oahu TOU: Subject to PUC Approval

	ARD TOU R	ARD TOU G	ARD TOU J
Customer Charge (1 phase)	~ $6 /bill	~ $9 /bill	~ $50 /bill
Customer Charge (3 phase)	~ $7 /bill	~ $11 /bill	~ $55 /bill
Grid Access Charge	~ $9 /bill	~ $20 /bill	~ $4 per kW
Daytime Energy Charge	~ 20 ¢/kWh	~ 23 ¢/kWh	~ 21 ¢/kWh
Overnight Energy Charge	~ 40 ¢/kWh	~ 46 ¢/kWh	~ 42 ¢/kWh
Evening Peak Energy Charge	~ 60 ¢/kWh	~ 69 ¢/kWh	~ 63 ¢/kWh

Importance of the TOU Study

- Assess impacts from customers in the TOU study
  - Changes and shifts in energy usage across TOU periods
  - Bill impacts
  - Incremental cost shifts

- Track, report, evaluate, change, and improve all elements of the TOU rate rollout in response to findings and clearly incorporate these learnings into future rate design initiatives.

MAHALO!

- Contact Hawaiian Electric Company’s Pricing Division for more information

C&C OF HONOLULU BENCHMARKING PROGRAM

MARISSA KUNSCH
C&C OF HONOLULU

City and County of Honolulu
Office of Climate Change, Sustainability, and Resiliency

O’ahu Better Buildings Benchmarking

How did the benchmarking program come to be?

Mayor Blangiardi signs into law Ordinance 22-17, formerly known as Bill 22. Bill signing was attended by utility reps from HECO, BWS, and Hawai'i Gas, as well as reps from Hawai'i Energy and OCCSR.

City-wide: Ordinance 22-17

Large commercial and multi-family buildings on O'ahu required to benchmark and report their energy and water usage annually.

Municipal: Ordinance 20-47

City and County of Honolulu required to benchmark the energy and water use of municipal buildings larger than 10,000 sqft in total floor area.

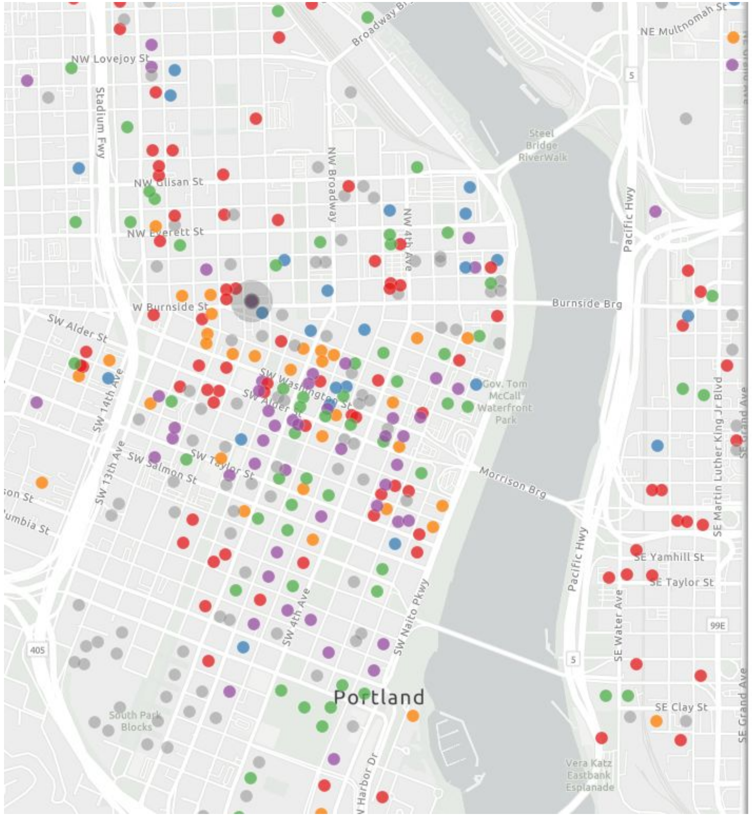
What is benchmarking all about?

You can't manage what you don't measure.

Benchmarking Program Components

Benchmarking	Tracking and reporting energy and water use of a building over time
Reporting	Sharing a building's utility data with the City to improve existing programs and services
Transparency	Making building benchmarking data publicly available

Building Energy Performance Maps: Portland



10 NW 10TH AVE

10 NW 10TH AVE

Building Use: **Office**

30,770 sf built in **1910**

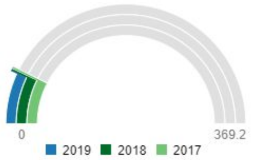
Total GHG Emissions (Mt CO2e): **139.6**

ENERGY STAR® Score: **56** | **Unverified**

Compliance Status: **Compliant**

Energy Performance: **Mid-Performer**

Energy use per square foot



Energy use per square foot decreased from 52.6 kBtu / sf in 2018 to 51.7 kBtu / sf during the 2019 reporting year.

Who needs to benchmark their building & by when?

The City implemented a benchmarking program requiring buildings of a certain size to benchmark and report their energy and water use annually.

Building Sector	Building Size (sq ft.)	Benchmarking Timeline			
		Spring 2022	June 30, 2023	June 30, 2024	June 30, 2025
City Buildings	≥10,000	**Benchmark & Report**			
Commercial & Multifamily Buildings	≥100,000		**Benchmark & Report**		
	≥50,000			**Benchmark & Report**	
	≥25,000				**Benchmark & Report**

Initial reporting deadlines shown above are phased in by building size, recurring annually on June 30th of each year.

What are the basic steps to benchmarking?

ENERGY STAR
ENERGY STAR® Portfolio Manager®

Steps to Benchmark:

Steps to Benchmark	*Est. time for first-time users:*
1. Gather building and consumption data	Varies
2. Create a Portfolio Manager account 3. Add information about your property 4. Enter energy and water data* 5. Analyze results and monitor progress	2-3 hrs.

*Subsequent updates require minimal time to enter usage data annually

---

Building characteristics
(e.g., type, size, schedules, occupancy)

+

Meter consumption
(e.g., electricity, water)

=

Energy Star Score
(1-100)

Energy Use Intensity
(kBtu/sq ft/yr)

What is an *"O'ahu Building ID"*?

O'ahu Building ID

A unique ID used by the City and County of Honolulu to identify individual building structures on O'ahu. The ID is a *Structure Object ID* (SOI) calculated from the US National Grid Coordinate for the center of the structure.

Mahalo!

Contact us!

Energy Program: energyprogram@honolulu.gov

Office of Climate Change, Sustainability and Resiliency

resilientoahu.org/benchmarking

DISCUSSION

C&C of Honolulu Benchmarking

- Will the C&C of Honolulu be estimating savings or is it possible to pull savings from Energy Star Portfolio Manager?
- Will there be sufficient information to estimate savings net of projects participating in Hawai‘i Energy programs?

HECO TOU Pilot

- Will HECO be developing any estimates of energy savings as part of their analysis?
- If not, is it possible for the TWG to receive data & estimate savings?
- Will there be any non-routine events that will prevent the pilot energy savings from being applied to the broader population upon full roll out?

UPDATE ON THE 3RD EEPS REPORT TO LEGISLATURE

JENNIFER BARNES

ENERGY EFFICIENCY MANAGER TEAM

KELLY MARRIN

APPLIED ENERGY GROUP

BACKGROUND

The 3rd EEPS Report to the Legislature is due this year

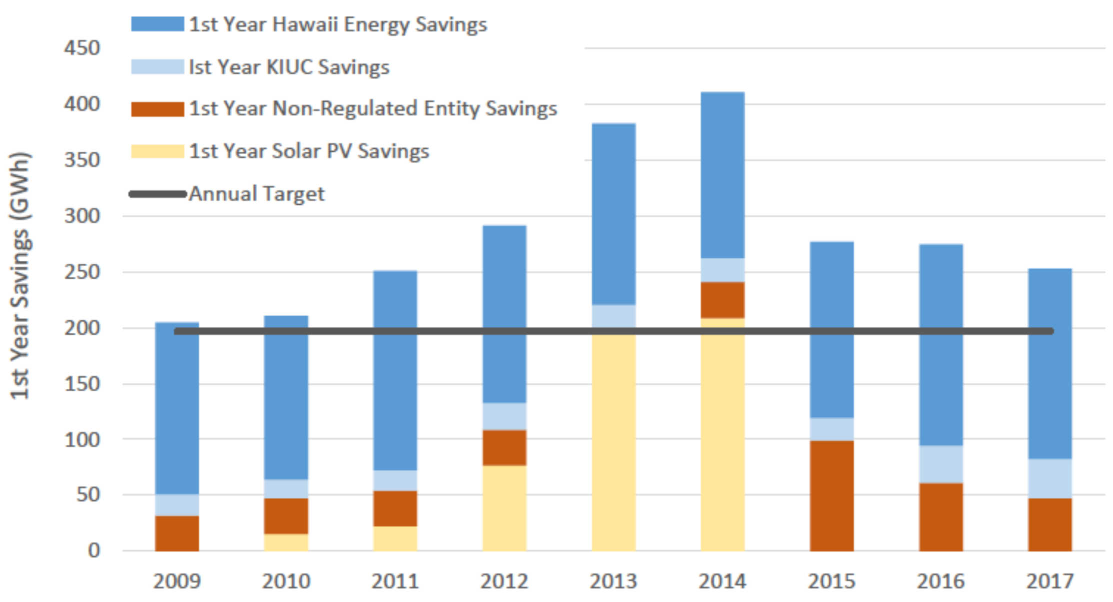
Delivery date is 20 days prior to the start of the legislative sessions – therefore, report is due to legislature in December of 2023

EEPS Performance Periods (calendar years)	Evaluation Reports	Due to Legislature
2009-2015	First Report (EEPS & PBFA start up)	January 2014
	Second Report	January 2019
2016-2020	Third Report	January 2024
2021-2025	Fourth Report	January 2029
2025-2030	Fifth Report	January 2034

- Delay between performance and evaluation periods allows time for 1 year+ of billing data after performance period ends analysis begins

KEY ACTIVITIES & STATUS

Figure 1. Annual 1st Year Energy Efficiency Accomplishments, Statewide



- Collect program accomplishments from Hawai‘i Energy
- Collect information from contributing entities
  - Send advance emails
  - Conduct interviews
  - Complete analysis
- Document findings
- Develop report to legislature

PROJECT TIMELINE

Activity	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Collect Hawaiʻi Energy Data			D, F								
Collect Contributing Entity Data					D	F					
AEG Reporting						D	F				
Draft Report Delivered to HPUC									D		
Final Report Delivered to HPUC										F	
Report Delivered to Legislature											

NEXT STEPS & WRAP UP

JENNIFER BARNES

ENERGY EFFICIENCY MANAGER TEAM

QUESTIONS?

- Please contact Jennifer Barnes at 510-756-1501 or jenniferbarnes@2050partners.com.
- Meeting materials will be posted on www.HawaiiEEPS.org