Technical Advisory Group

Hawaii PBFA Programs

February 25, 2020

Agenda

- 10:40 – Welcome and Context
- 10:50 – PBF Program Updates and Annual Review
- 11:20 – Evaluation, Measurement and Verification Activities
- 11:25 – PY2018 Verification Report Overview
- 11:45 – TRM Update Highlights
- 12:00 – PBF Surcharge Collection Design
- 12:30 – Adjourn

Context for PBF Program Updates

- **We discussed the Hawai'i Energy Proposed Triennial Plan at our March 2019 meeting**
- **The Plan was proposed, and a supplemental filing submitted on June 12, 2019**
- **The Commission issued an Approval Order, with modifications, on October 25, 2019.**
- **On December 31, Hawai'i Energy provided a response to Order Number 36708, with Modifications, Improvements and Additions to the Triennial Plan**
- **Modifications and improvements include the following areas;**
  - Additional details and justification for Energy Optimization Initiatives (EOI)
  - Additional details and justification for Market Transformation and Economic Development (MTED) core area initiatives
  - Improved metrics to evaluate performance
  - PBFA to work with commission staff and stakeholders to develop a robust and detailed 10-Year Plan
  - PBFA and Hawaiian Electric Companies prioritized collaboration efforts

Hawai‘i Energy Update

Technical Advisory Group

Tuesday, February 25, 2020

AGENDA

- **Implementing the Triennial Plan**
  - Status and forecast
  - Highlighting selected new program offerings
  - Hawai‘i Energy’s response to PUC Approval Order
  - Market Transformation & Economic Development
  - Energy Optimization Initiatives
    - Demand Response Ready / Enablement
    - Energy Storage Pilot Programs
    - Electrification of Transportation
  - Modified Annual Report
- **Hawai‘i Energy & Hawaiian Electric Collaboration**
  - Updating of framework
  - North Kohala collaboration
- **10 Year Roadmap Update**

PY19 Status and Forecast

- Percentage is current performance to target
- Color reflects current forecast for year-end
  - Green = 100%
  - Yellow = 95-99%
  - Red = below 95%

	Status - 60% through PY19			
	Clean Energy Technologies			
	First Year Energy Reduction (kWh)	Lifetime Energy Reduction (kWh) (new)	Peak Demand Reduction (kW)	Total Resource Benefit ($)
Business Prescriptive	*74%*	*75%*	*81%*	*79%*
Business Custom	*34%*	*56%*	*48%*	*50%*
Residential Incentives	*54%*	*49%*	*59%*	*50%*
	Accessibility & Affordability			
Business HTR	*30%*	*29%*	*38%*	*32%*
Residential HTR	*38%*	*27%*	*41%*	*36%*

PY19 Q4 FOCUS AREAS

	Status - 60% through PY19			
	Clean Energy Technologies			
	First Year Energy Reduction (kWh)	Lifetime Energy Reduction (kWh) (new)	Peak Demand Reduction (kW)	Total Resource Benefit ($)
Business Prescriptive	*Strong Midstream, Lighting and HVAC*			
Business Custom	*Pipeline with large projects including Sand Island WW, C&C street lighting*			
Residential Incentives	*Strong performance from HVAC and tune-up programs, SHW push for final quarter*			
	Accessibility & Affordability			
Business HTR	*Targeted restaurant program - marketing and additional ally training*			
Residential HTR	*Focus on additional bulk purchases, community based energy efficiency*			

Selected New Program Offerings

Clean Energy Technologies

Energy and project advisory services
Metering and monitoring
Smart building incentives
Energy storage incentives
EV charging station incentives

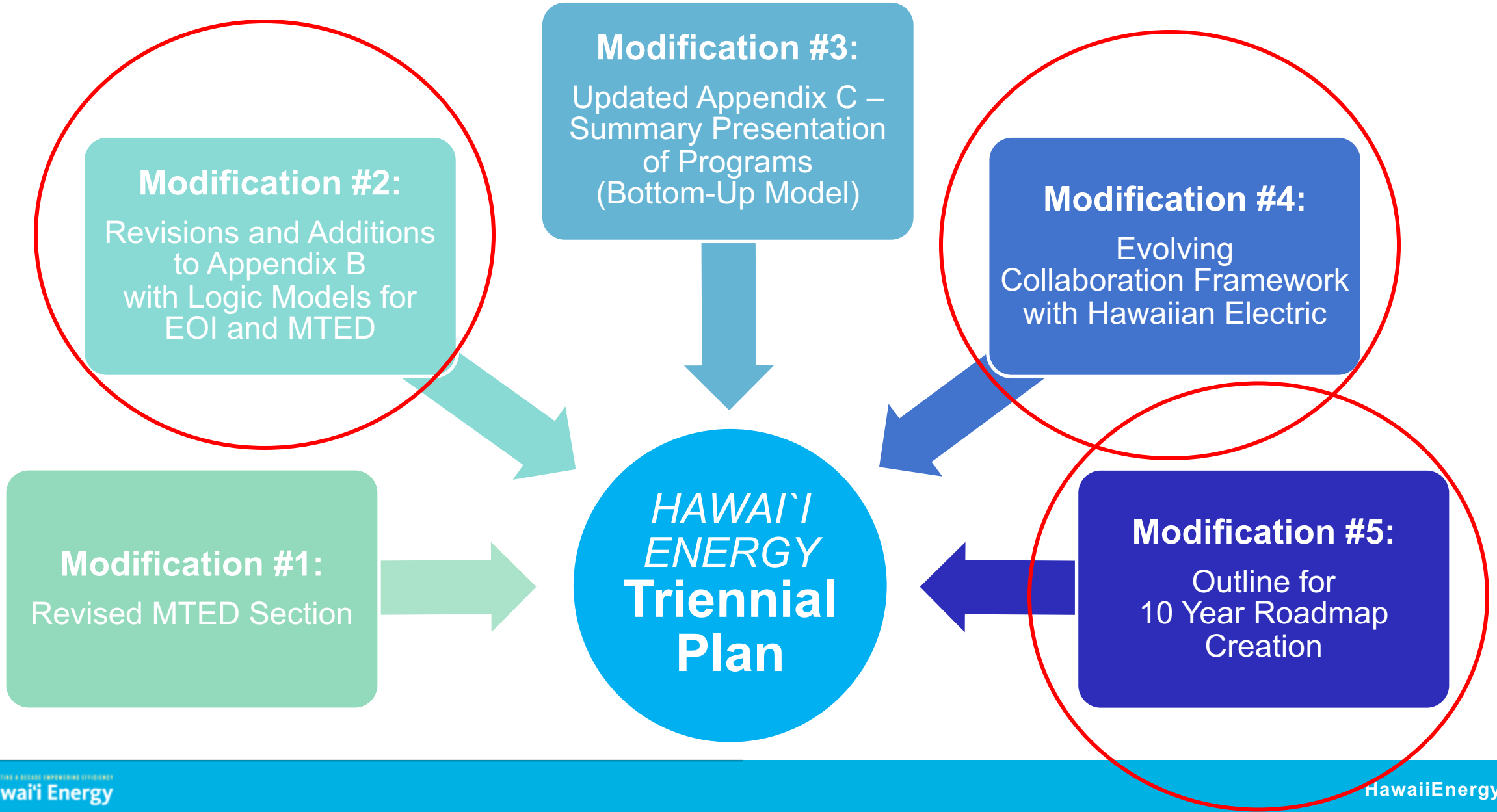
Accessibility & Affordability

Incentives for specific communities
ALICE® family focused programs
Expansion of nonprofit partners
Deeper small business services

Market Transformation & Economic Development

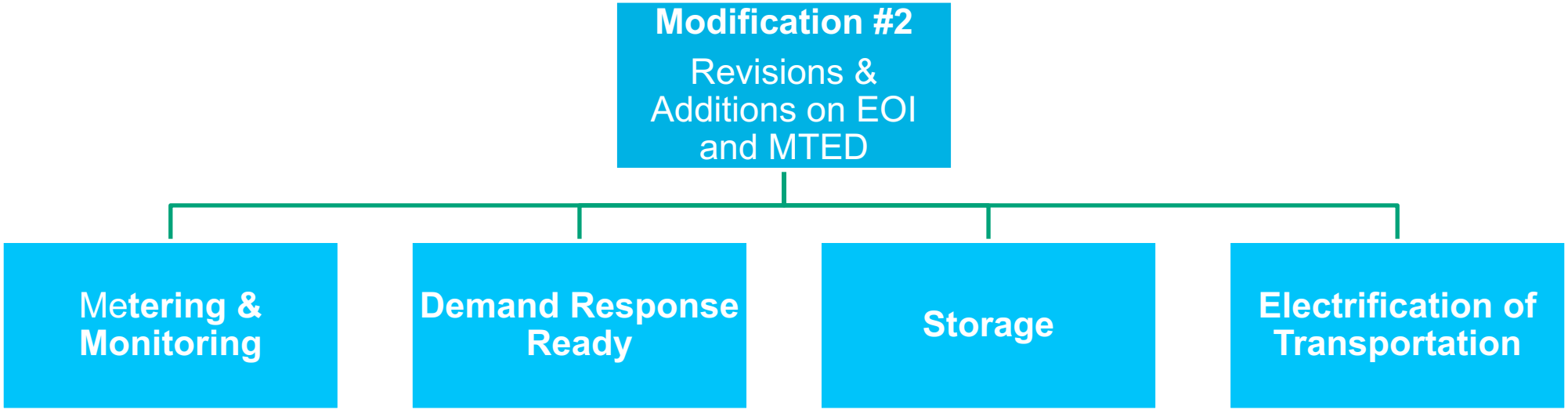
Clean energy innovation hub

HAWAIʻI ENERGY'S APPROVAL ORDER RESPONSE



Market Transformation & Economic Development

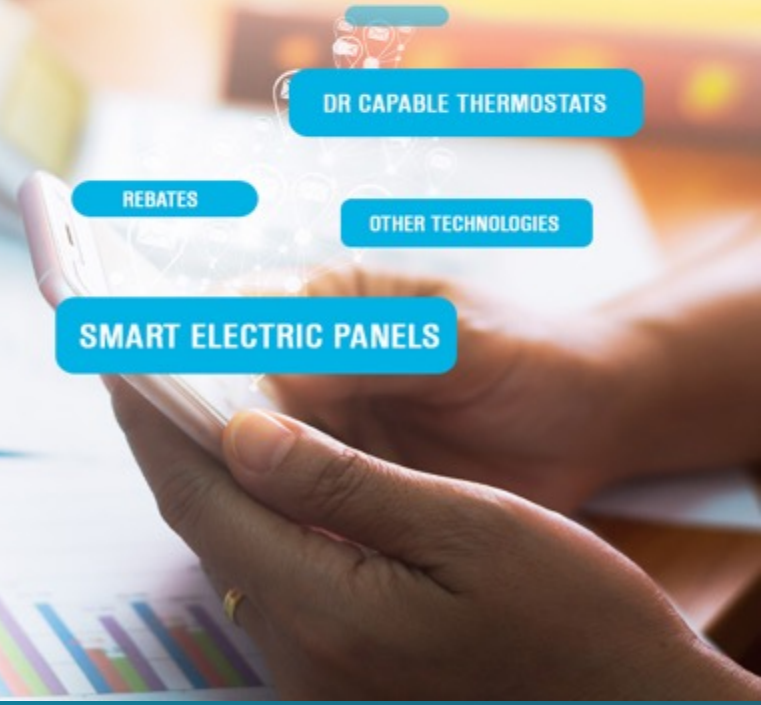
- **Modification #2: Revisions and Additions to Appendix B with Logic Models for Energy Optimization Initiatives (EOI) and Market Transformation & Economic Development (MTED)**



  - **Metering & Monitoring Services**
  - **Demand Response Ready:** incentives for grid service capable technologies enabling customers to participate in DR programs
  - **Energy Storage: i**ncentives for customer-sited energy storage systems
  - **Electrification of Transportation: i**ncentives to promote electric vehicle charging infrastructure

DEMAND RESPONSE READY

- **Support energy use reduction while ensuring demand response capability when EE investments are made**
- **Pilot technologies for energy savings and load flexibility**
  - Grid Interactive Water Heaters (GIWH)
  - EMS and smart thermostat incentive "kickers"
  - Building controls combined with load monitoring and automated demand response capabilities
  - Connected homes and smart electric panels –Lumin, and Span.io
  - Heat Pump Water Heaters (HPWH) w/Controls (research underway)
- **PY19-20**
  - Efficiency education
  - Obtain data for program planning & analysis and cost-effectiveness
  - Provide market Support for other technologies and vendor/stakeholder engagement
- **PY21**
  - Identify opportunities for Accessibility & Affordability
  - Analyze trends from phase one to modify incentives to cultivate additional projects
  - Support other technologies targeted by GSPA contractors



Enabling Demand Response
Grid Interactive Water Heaters

SHIFTED ENERGY

Installation of grid-interactive water heaters
– easy to retrofit; controls only, not a tank replacement

Full implementation after successful pilot of 400 installs

Target audience – low-income, multifamily units that can't install solar water heating

Hawai'i Energy provides $250 per controller for residents (additional DR program incentives provided by HECO)

Forecast – 2,700 installations in next 30 months



Photo Credit: Shifted Energy

Foundational Work: Pairing of Efficiency with PV + Storage Customers

Partnered with Sunrun to deploy energy efficiency kits and provide education to homeowners on when to use energy with PV + storage systems, along with how to reduce overall consumption.



Energy Storage in the Efficiency Portfolio

- **Years 1 & 2 (2020 and 2021) – Pilot programs to support load shifting and customers' capacity to be active grid participants**
  - Industry stakeholder feedback January – February 2020
  - Request for Projects (RFP) to be released in March 2020
  - Residential and Business Pilots potentially targeting:
    - Circuits with low hosting capacity (if locational value data is available)
    - Critical infrastructure
    - Locations looking to retrofit existing PV with batteries (making old systems "smart")
    - Multifamily dwellings or small businesses
    - LMI (or hard to reach, affordable housing, ALICE, etc.) or other customer class facing barriers to adoption
- **Year 3 – Full Program Rollout**



2019 EV Charging Station Pilot Program

Objectives:

- Increase EV charging station infrastructure in workplaces and multi-family unit dwellings
- Pair with energy efficiency to reduce electrical infrastructure upgrade costs – major barrier
- Support grid stability through peak load shifting and daytime charging

Results:

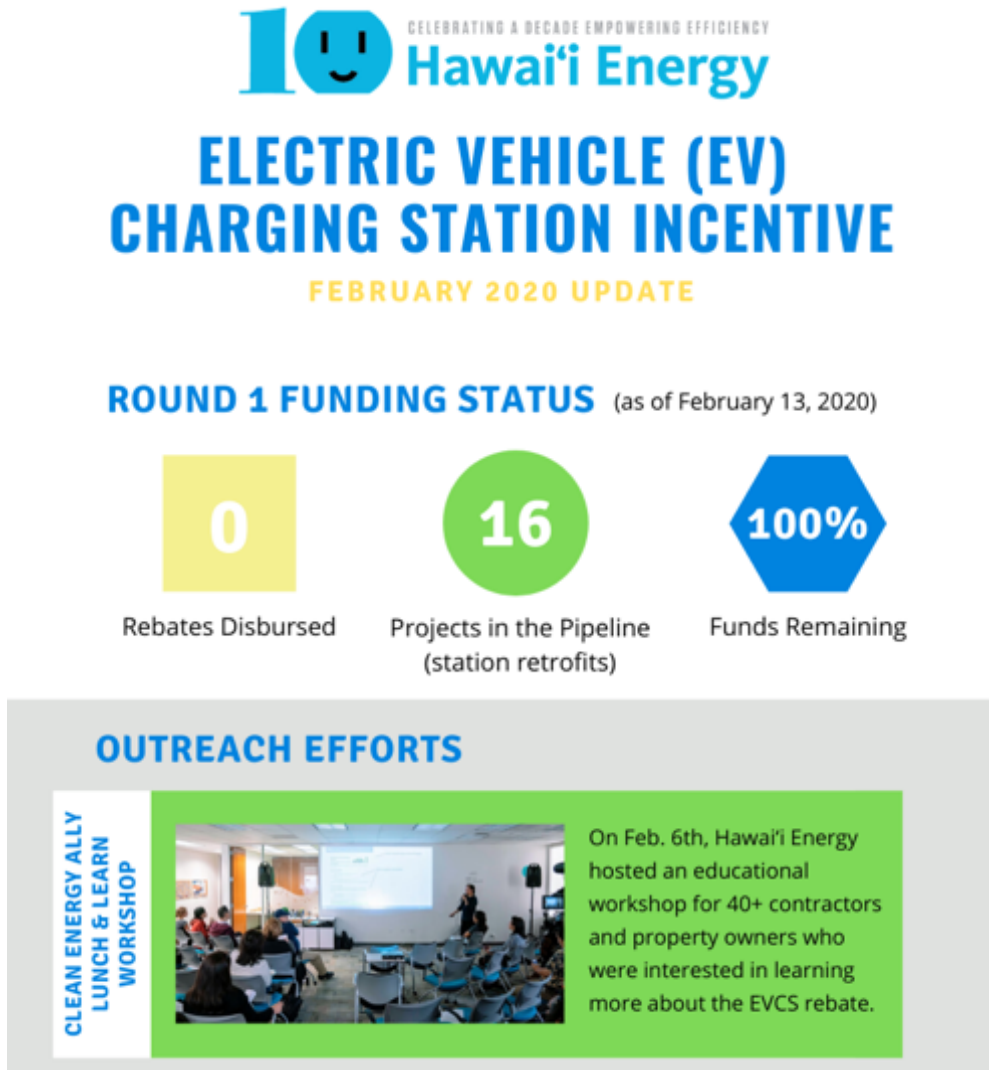
- 20 new installations and 1 retrofit
- Total $101,500 rebates deployed
- Spurred legislation in 2019 to provide rebates from taxpayers (rather than ratepayers) to further accelerate these efforts



2020-2021 EV Charging Station Program

- New State policy (Act 142) signed into law in June 2019
- Program launched January 1, 2020
- $400,000 for EV Charging through June 2021
- Hawai‘i Energy is administering the program under the Hawai‘i Public Utilities Commission
- 16 projects already completed
- Evaluating bonus incentives through ratepayer funding for affordable housing

STATE OF HAWAII
PUBLIC UTILITIES COMMISSION



Revised Annual Report For Years 1 and 2 of the Triennial

- **Format for Years 1 and 2**
  - High level overview on program performance and accomplishments (approximately 10 – 20 pages)
  - Data required for annual EM&V will be an addendum to the document
  - Presentation will be made at the Fall TAG meeting

- **Year 3 Final Triennial Report format still under development**

MOD 4: COLLABORATION WITH HAWAIIAN ELECTRIC

- **Key Elements**
  - Program Conceptualization & Development
  - Marketing and Customer Experience
  - Data Definition & Exchange
- **Priority Areas for Collaboration**
  - Customer Energy Resources and Energy Optimization
  - Low income customer assistance
  - Electrification of transportation
  - Online marketplace and utility energy efficiency offerings
  - Long term forecasting
- **Revised Framework to Establish:**
  - Desired outcomes
  - Points of concern
  - Potential duplication

Evolving Programming: North Kohala

Current Situation

Single 34.5 kV line built in the 1950's

Approximately 10 MW wind farm and 2 MW of distributed solar in the community

Hawaiian Electric Light Company Evaluating Options

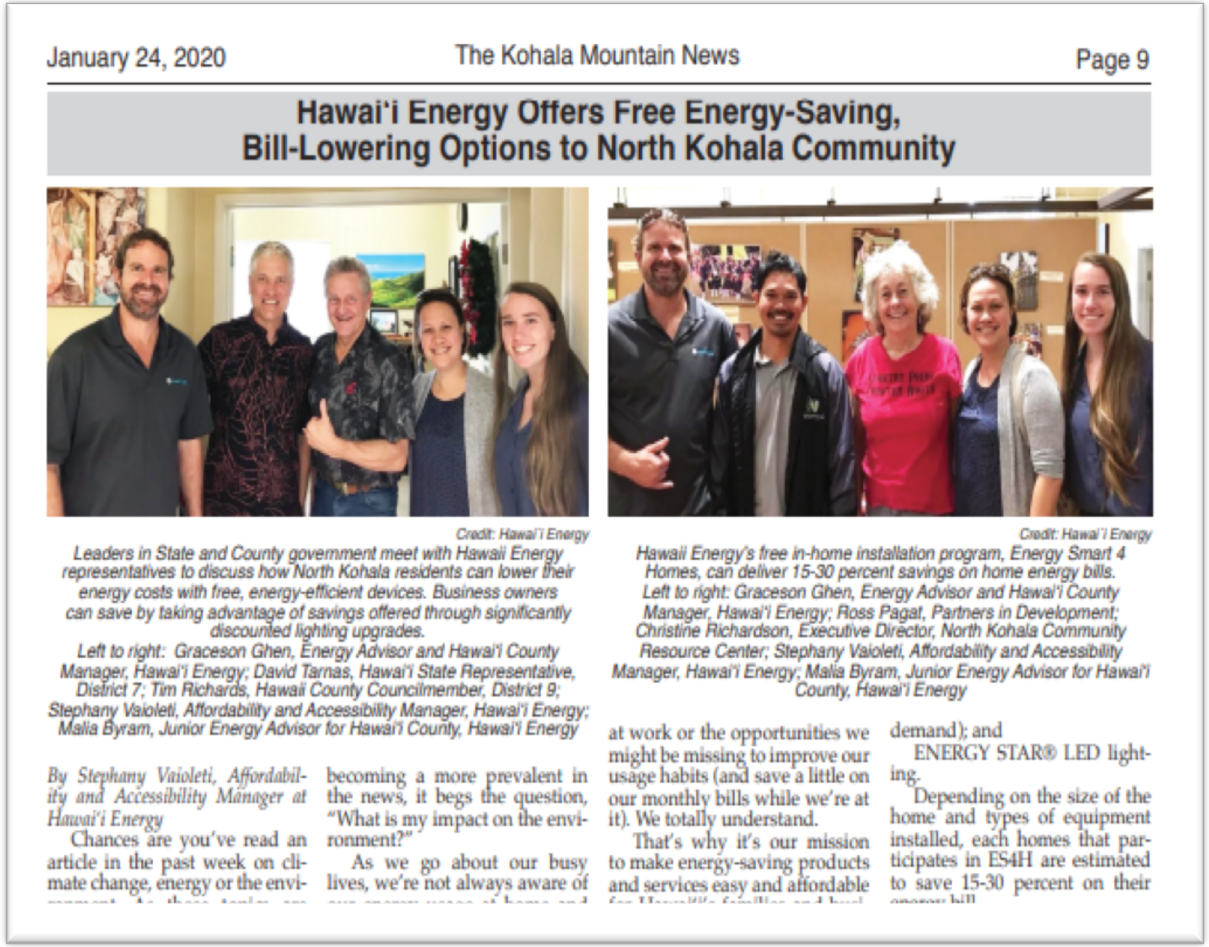
Reducing and shifting energy use could provide an opportunity for a microgrid and NWA solution



- Community Workshops
- Energy Smart 4 Homes
- Bulk Appliance Replacements
- Solar or Heat Pump Water Heating
- Business Efficiency Solutions
- Contractor Training Workshops

STAKEHOLDER ENGAGEMENT IN PROCESS

- **Partners in Development Foundation** signed as fiscal agent for Hui Up Appliance Exchange, as well as finding opportunities to engage the Kohala community
- **Updating local legislators** - Rep. David Tarnas, Sen. Lorraine Inouye, and Councilman Tim Richards are appraised, supportive, and holding a legislative talk story session to include Hawai`i Energy on 02/25
- **Free energy audit** for Kohala Hospital to explore how HE can assist with recommendations and access other sources of funding
- **Marketing** through targeted mailings and Kohala Mountain News



January 24, 2020 The Kohala Mountain News Page 9

Hawai'i Energy Offers Free Energy-Saving, Bill-Lowering Options to North Kohala Community

Credit: Hawai'i Energy

Leaders in State and County government meet with Hawaii Energy representatives to discuss how North Kohala residents can lower their energy costs with free, energy-efficient devices. Business owners can save by taking advantage of savings offered through significantly discounted lighting upgrades.

Left to right: Graceson Ghen, Energy Advisor and Hawai'i County Manager, Hawai'i Energy; David Tarnas, Hawai'i State Representative, District 7; Tim Richards, Hawaii County Councilmember, District 9; Stephany Vaioleti, Affordability and Accessibility Manager, Hawai'i Energy; Malia Byram, Junior Energy Advisor for Hawai'i County, Hawai'i Energy

Credit: Hawai'i Energy

Hawaii Energy's free in-home installation program, Energy Smart 4 Homes, can deliver 15-30 percent savings on home energy bills. Left to right: Graceson Ghen, Energy Advisor and Hawai'i County Manager, Hawai'i Energy; Ross Pagat, Partners in Development; Christine Richardson, Executive Director, North Kohala Community Resource Center; Stephany Vaioleti, Affordability and Accessibility Manager, Hawai'i Energy; Malia Byram, Junior Energy Advisor for Hawai'i County, Hawai'i Energy

By Stephany Vaioleti, Affordability and Accessibility Manager at Hawai'i Energy

Chances are you've read an article in the past week on climate change, energy or the environ-

becoming a more prevalent in the news, it begs the question, "What is my impact on the environment?"

As we go about our busy lives, we're not always aware of

at work or the opportunities we might be missing to improve our usage habits (and save a little on our monthly bills while we're at it). We totally understand.

That's why it's our mission to make energy-saving products and services easy and affordable

demand); and

ENERGY STAR® LED lighting.

Depending on the size of the home and types of equipment installed, each homes that participates in ES4H are estimated to save 15-30 percent on their

MOD 5: 10 YEAR ROADMAP COMPONENTS

- Reduce energy (kWh) usage and shift demand (kW) in alignment with the state's Energy Efficiency Portfolio Standards (EEPS) (Objective 1)
  - Informing sources– Potential study, ongoing Hawai'i Energy market engagement, codes and standards outlook, stakeholder engagement, Hawai'i Energy market transformation program results
- Transform buildings into smart, resilient, grid resources (Objective 3)
  - Employ locational targeting of energy efficiency and flexible loads for grid benefit
  - Accelerating innovation and adoption of new technologies
  - Facilitate adoption of distributed technologies that can provide grid services and resiliency
  - Informing sources – Hawaiian Electric collaboration, Hawaiian Electric IGP, Elemental Excelerator and other accelerators, national labs, VEIC, NEEA, and Hawaiian Electric NWA procurements
- Providing critical assistance to low-income households, small businesses, and other hard-to-reach customer segments. (Objective 4)
  - Informing sources – Hawai'i Energy A&A MT&ED programs and strategic interventions, community engagement work, stakeholder engagement, Hawaiian Electric
- Reduce carbon emissions from transportation (Objective 2)
  - Informing sources – HECO's EOT roadmap, critical backbone study, current and prospective legislation, stakeholder engagement

Hawai'i Energy

INNOVATION SYMPOSIUM

APRIL 29 @ THE SHERATON WAIKIKI

Mark your calendar!

Evaluation Measurement and Verification (EM&V) Topics

Technical Advisory Group
Hawaii PBFA Programs

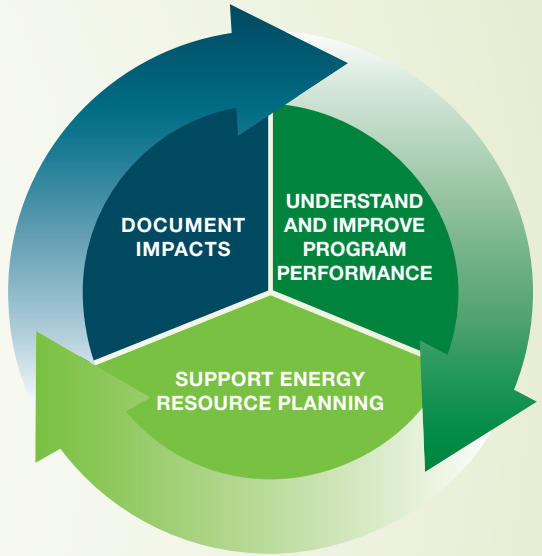
Steve Schiller, Energy Efficiency Manager Team

February 25, 2020

Context

Why we do EM&V

- Support assessment of compliance with PBFA goals and performance incentives calculations - **Provide PROOF of the effectiveness of energy management**
- Feedback for program design and prioritization of EE actions - **Provide data to support efficiency as a reliable resource**
- Feedback for resource planners and overall EEPS and RPS compliance - **"You can't manage what you don't measure"** and **"Things that are measured tend to improve".**



EVALUATION SUPPORTS SUCCESSFUL EFFICIENCY PROGRAMS

CY 2019 and PY 2018 EM&V Activities – Completed

- **Verifications:**
  - **PY17 verification (completed April 2019)**
  - **PY18 verification (next agenda item)**
- **Technical Reference Manual (TRM)**
  - **Updated PY19 TRM and created new PY20 TRM (following agenda item)**
  - **Minor updates to TRM Framework**
- **Documentation**
  - **Summary of EM&V research activities and methods for PY17 and during CY18 (completed April 2019)**
  - **History of annual EM&V-related research (completed April 2019)**

Ongoing and Upcoming EM&V Activities

- **Ongoing EM&V activities:**
  - **LED Market Transformation Attribution**
  - **Codes & Standards Attribution**

- **Upcoming EM&V activities:**
  - **Peer (home energy reports) impact evaluation using control group**
  - **Document last year's EM&V work**
  - **Update "history" of PBF and EEPS**

EEM Team Members

- New Team Members
  - Mary Sutter and Jenn Mitchell-Jackson of Grounded Research and Consulting, LLC
  - Mary@grounded-research.com and Jennifer@grounded-research.com

- Continuing Team Members
  - Ted Pope - TedPope@2050partners.com
  - Jenn Fox - JennFox@2050partners.com
  - Steve Schiller – Steve@schiller.com

Technical Advisory Group Hawai‘i Energy PY2018 Preliminary Verification Results

Sue Hanson and Kendra Mueller, Tetra Tech

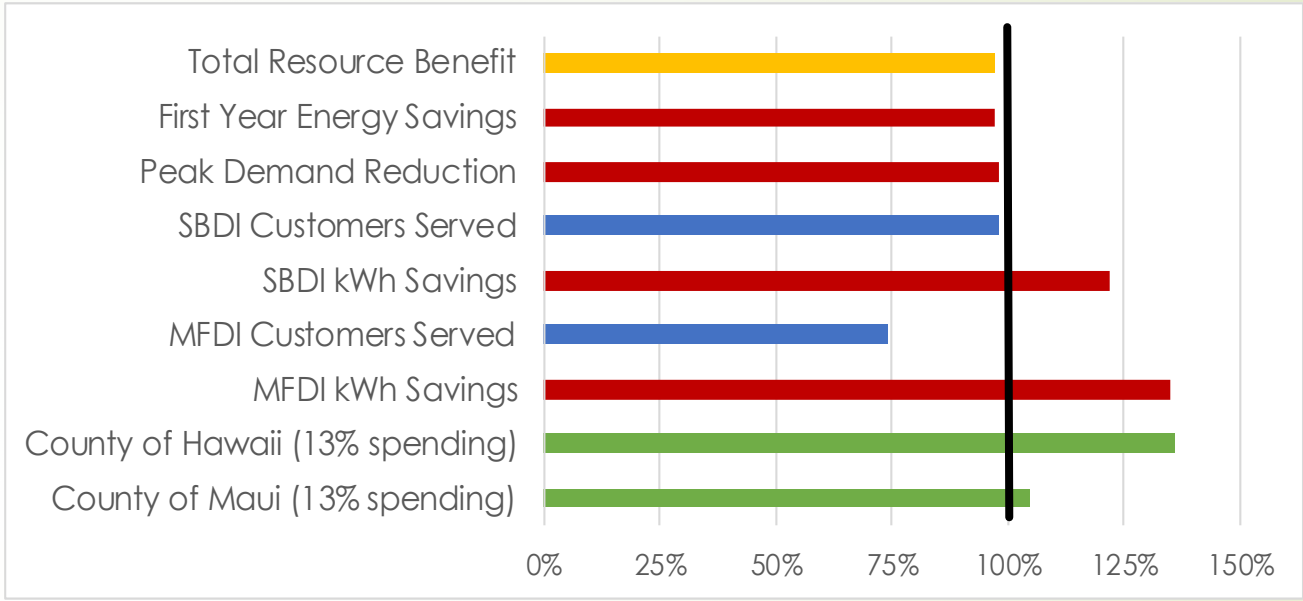
February 25, 2020

Agenda

- Overall Preliminary Results
- Recommendations
- PY2018 Preliminary Performance Overview
- Verification Activities

Overall Preliminary Results

- Met or exceeded PY2018 targets for many performance targets
  - Very close to meeting Resource Acquisition targets (97% or 98% for all three)
  - Exceeded economically disadvantaged kWh targets
  - Exceeded customer satisfaction target
  - Met all Market Transformation targets

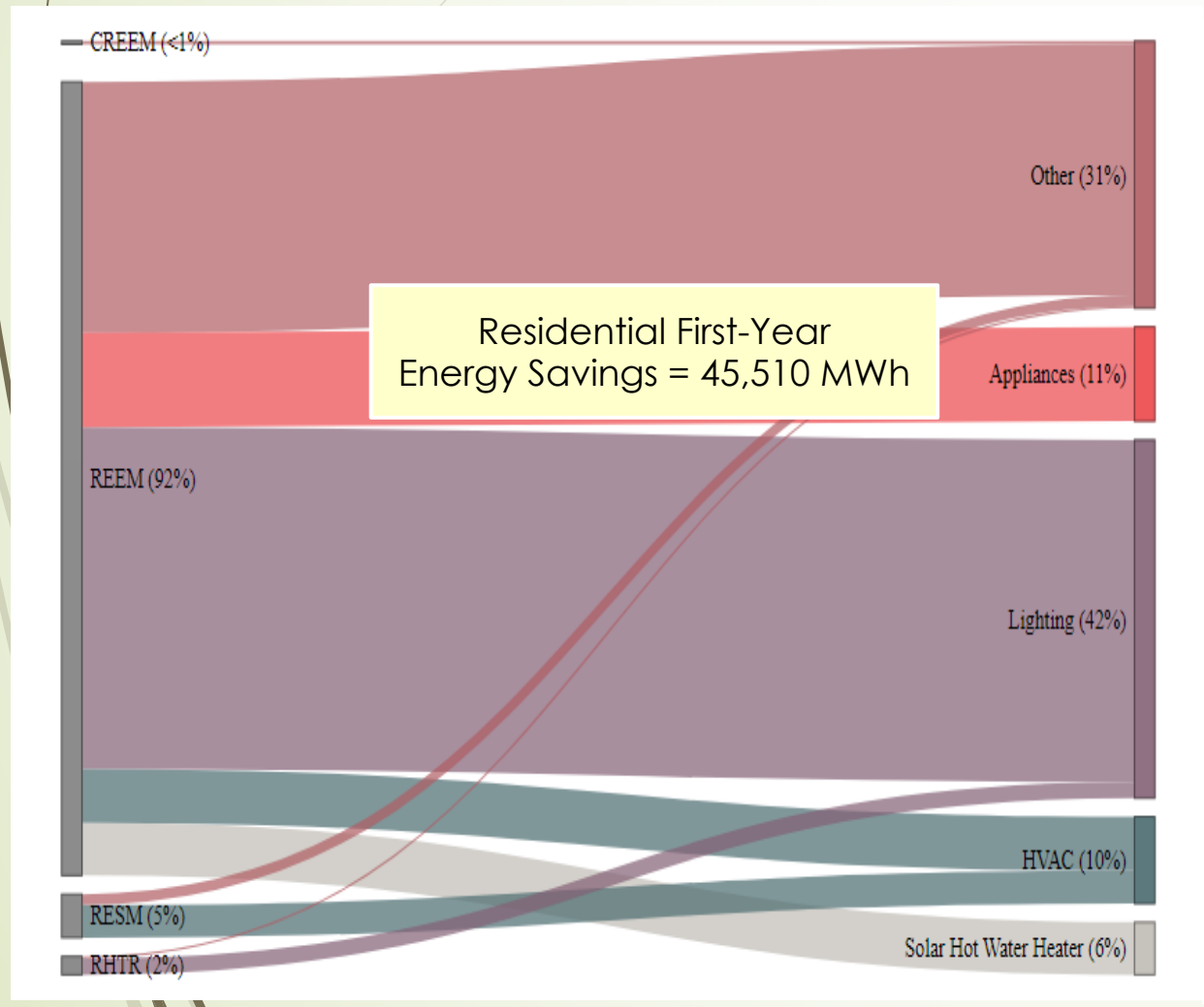


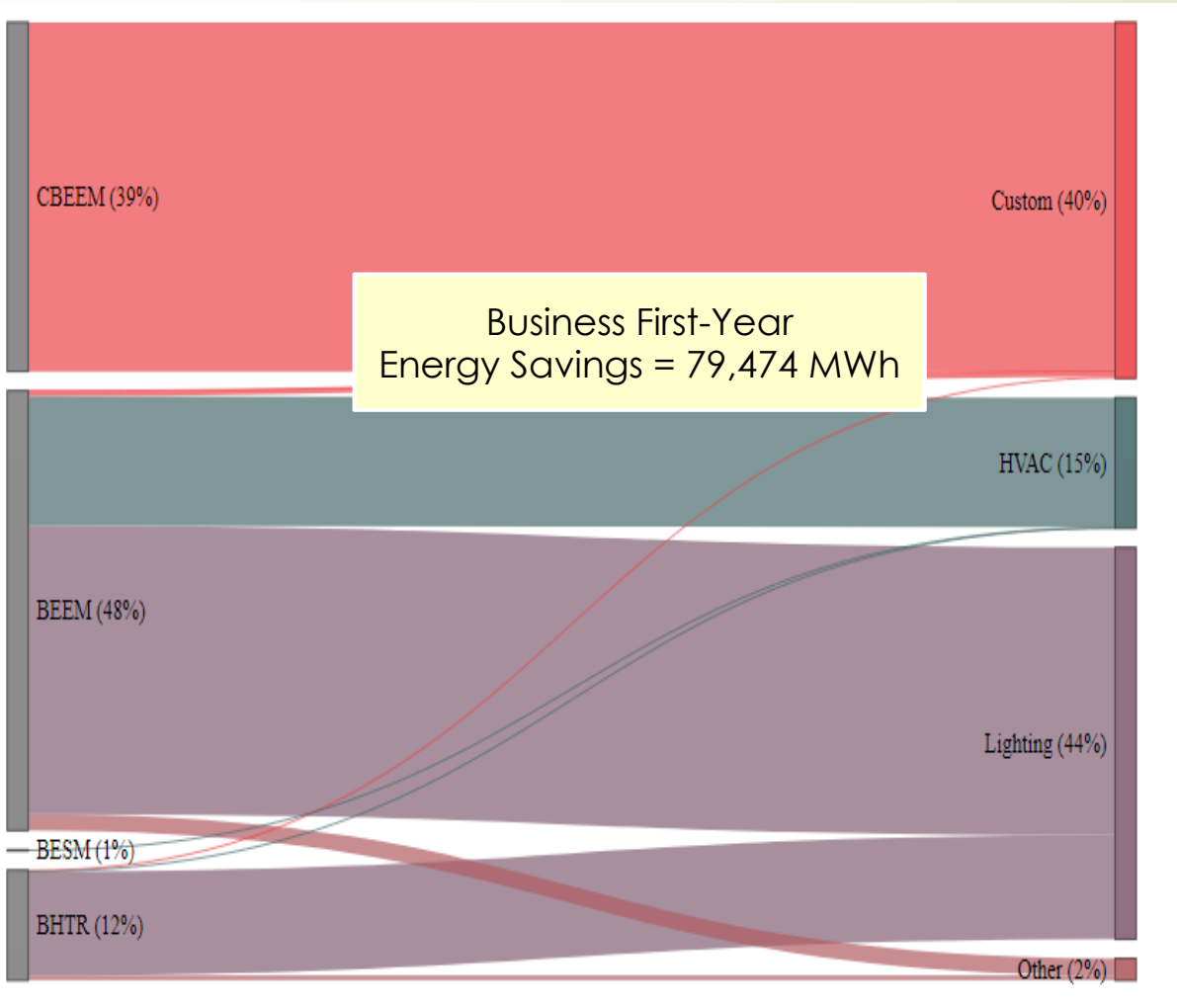
- Close agreement with Hawai‘i Energy claimed impacts
- Continued great collaboration and assistance from Hawai‘i Energy and HPUC staff

Resource Acquisition: PY2018 Preliminary Performance Overview

- 124,142,615 verified kWh (97% of target)
- 20,769 verified kW (98% of target)
- $324,083,802 total resource benefits (97% of target)
- Observations
  - High reliance on lighting savings continues across residential and business programs
  - Generally good adherence to the TRM for deemed savings projects
  - Custom business projects were well documented and with reasonable savings
  - Differences in total resource benefits are due to the annual savings adjustments as well as several measure life adjustments
- Overall all – solid results and in-line with expectations

Resource Acquisition: PY2018 Preliminary Performance Overview (con't)





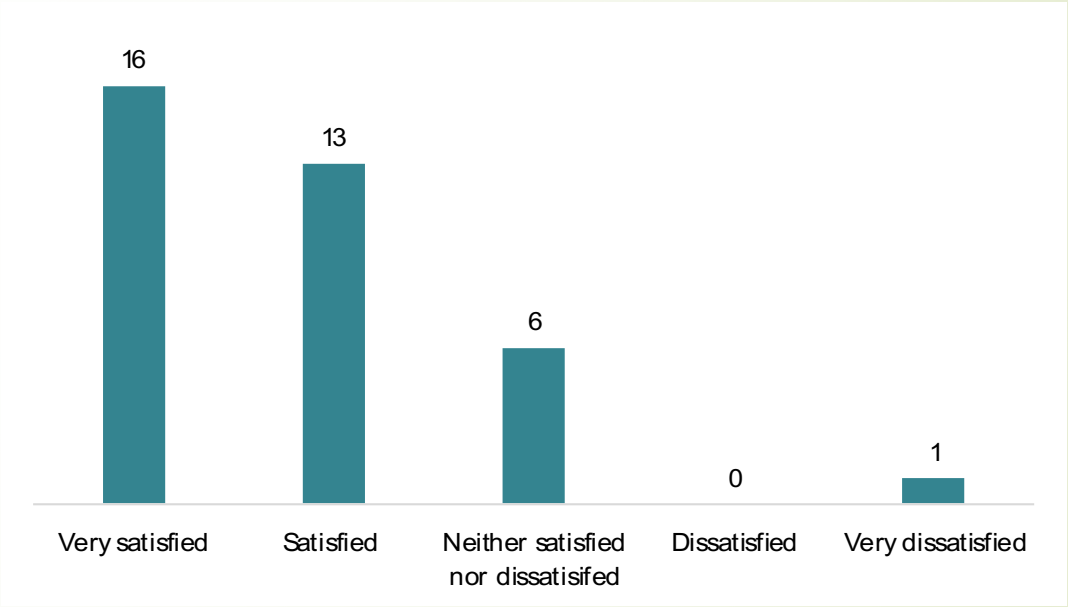
Customer Equity: PY2018 Preliminary Performance Overview

- Small business direct installations
  - 663 participants (198% of target)
  - Over 9.1 million kWh savings (122% of target)
- Multifamily direct installations
  - 2,740 units served (74% of target)
  - Over 1.8 million kWh savings (135% of target)
- Hawai‘i Energy continues their efforts to include all eligible islands and savings are occurring across eligible territory

Market Transformation: PY2018 Performance Overview

- Market Transformation efforts lay the groundwork for ongoing savings opportunities
- Activities exceeded targets for all sub-groups

Participant Satisfaction with Professional Development Training Attended



Customer Satisfaction: PY2018 Performance Overview

- In PY2018, 4,330 surveys were sent to customers
  - 22.3% responded to the survey
- Goal of 8.5 out of 10 average overall satisfaction rating
- Hawai‘i Energy surveys indicated 9.05 out of 10 overall satisfaction
  - Focused on email survey responses from those receiving rebates

Recommendations and Next Steps

- Carry over recommendations from PY2017 include:
  - For fully deemed measures, Hawai'i Energy should use the TRM methodology and eligibility criteria, including rounding the savings values in the same way as the TRM
  - Consider expanding the timing and methods for gathering customer satisfaction results
  - Hawai'i Energy should consider updating the data tracking system to differentiate between different forms of measure quantities recorded at the rebate or measure level
  - Findings from the verification process should continue to be used to inform TRM updates

Recommendations and Next Steps (con't)

- New recommendations include:
  - Ensure site inspections are closely examined to catch good-faith mistakes
  - Collect detailed information from customer sources, such as control systems, that will allow for better accuracy on custom calculations
  - Ensure that enough information is available for projects using utility billing regressions to address whether regressions are the best analysis approach
- Next steps:
  - Verification report to be reviewed and approved by the HPUC

What is Meant by Verification

What verification is:

- Assessment of Hawai'i Energy's program tracking database
  - Review measure installation counts, energy savings estimates, and Total Resource Benefits calculations
  - Determine to what level they match those reported by Hawai'i Energy
  - Savings are replicated based on the algorithms in the TRM; in part, this is why ensuring the TRM is accurate is so important
- Verification of award claim, island equity calculations
  - Use verified savings to determine how well Hawai'i Energy met its goals to distribute benefits across islands in a manner deemed equitable by the HPUC

Limitations of verification:

- Savings estimates are not independently calculated
- No process or market assessment activities

Verification Activities

- In-depth review of program reported savings
  - 100% tracking system review of deemed savings – conformance to TRM
  - Reviewed sample of 180 projects across residential and business programs
  - 9 site visits
- Independently calculated number of Peer program participants
- Reviewed customer satisfaction and documentation from Market Transformation programs to verify activities
  - Surveyed professional training participants on value and satisfaction perspectives
- Activities informed TRM updates and other analytic and policy discussions
- Developed recommendations for consideration in future program years

TRM Review and Update

Kelly Parmenter, Applied Energy Group

Hawai'i Energy TAG Meeting

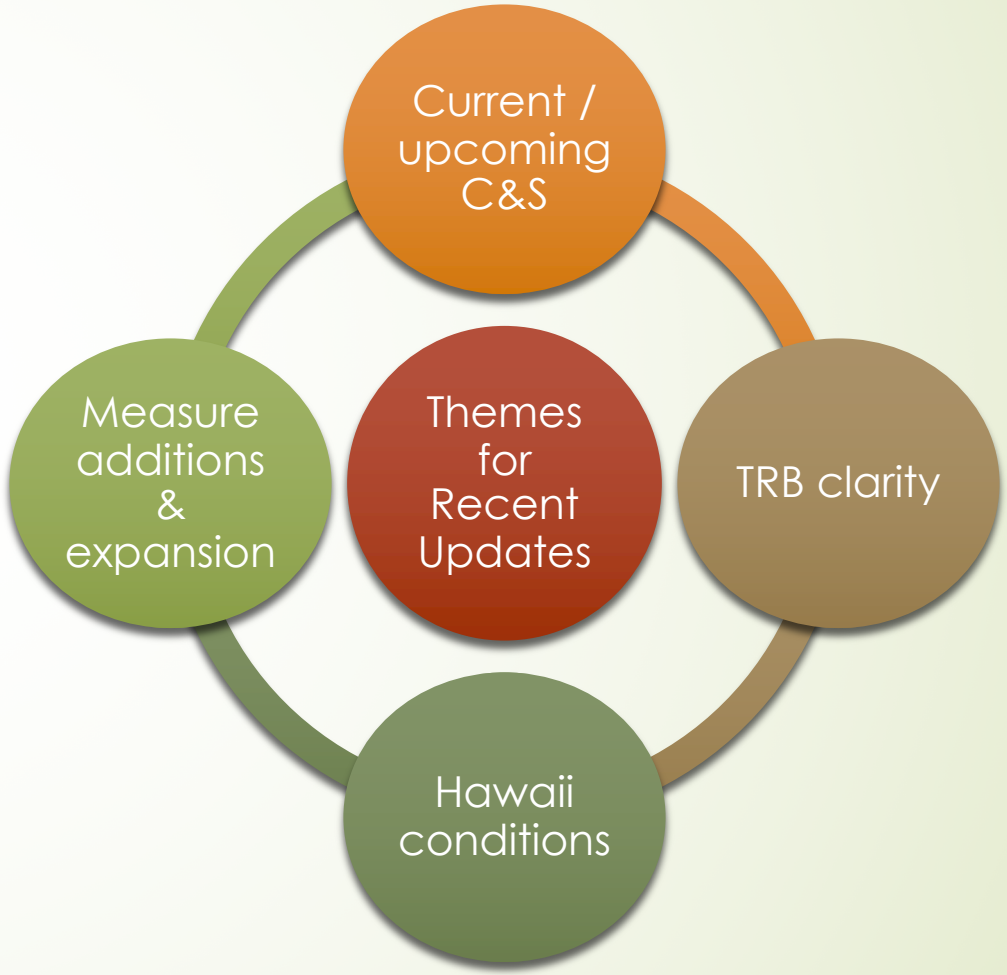
February 25, 2020

Outline

- Purpose of the TRM Review and Update
- Mid-Year PY19 TRM Additions
- PY20 Prioritization Process
- PY20 TRM Updates
- Examples of Measure Updates
- Key Findings and Implications

Purpose of TRM Review and Update

- Last year, a major review and update was carried out for the PY19 TRM
- This year, there were two sets of updates:
  - Mid-year additions to the PY19 TRM
  - Prioritized updates for the PY20 TRM
- The recent updates focused on a few key themes



Mid-Year PY19 Additions

- In Fall 2019, Hawai‘i Energy requested additions and changes to the PY19 TRM
  - New measures
  - Expanded measures
  - Corrections and clarifications
- Process
  - Hawai‘i Energy provided draft TRM entries for new measures and # of rebates expected
  - AEG reviewed information and developed plan
    - Assessed level of effort and budget requirements
    - Recommended how updates should be done and timing
  - EEM and HPUC approved plan

TRM Framework Clarifications:

Standard Process:

Measures should not be implemented until included in approved TRM

Expedited Approval:

The HPUC may grant expedited approval for measure implementation prior to finalization of the new TRM entry, but Hawai‘i Energy would assume some risk if savings changed significantly

Mid-Year PY19 Additions, Continued

New Measures

- **Residential: Linear LED**
- **Residential: Security Light**
- **Residential: Holiday String Light**
- **Commercial: Window AC**

Expanded Measures

- **Residential: Central AC** – Pre-2006 early retirement option
- **Residential: Faucet Aerator and Low-Flow Showerhead** – Online marketplace option
- **Residential: Window AC** – Expanded capacity bins

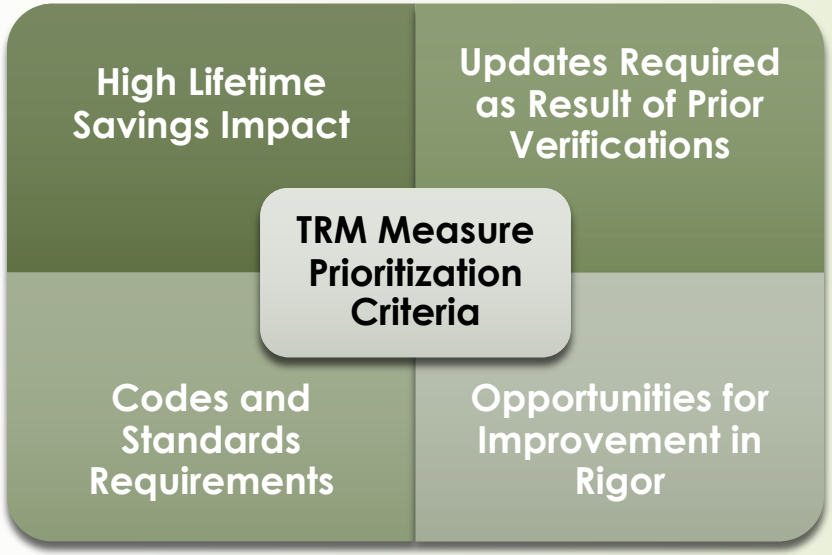
Clarifications & Corrections

- **Commercial: Guest Room EMS** – Clarification of large vs. small lodging
- **Commercial: Chiller Worksheet** – Corrections to cell reference errors

PY20 Prioritization

- Solicited feedback from TAG, Hawai'i Energy, EEM, HPUC, and Verification Team
- Compiled list of 90+ update ideas
- Used 4 criteria to determine a score for each update idea
- Ranked items by score
- Developed a cut-off based on budget

→ Selected the top dozen+ items



Thank you for your input!

- We received **great** feedback from multiple parties
- All feedback received has been added to the ongoing list
- Additional suggestions are welcome
- Each item will be considered in next year's prioritization process
  - PY21 TRM update process will start this summer

Fields in TRM Prioritization List
Item #
Sector
Measure Category
Measure Name
PY19 Tab Name
Additional Description
High Lifetime Savings Impact per Triennial Plan?
Doesn't Meet Current Codes & Standards?
Opportunity to Improve Rigor per AEG?
EM&V/HE/TAG/ EEM/HPUC Recommendation?
Overall Priority Score
Measure Updated for PY19?
Update Initially Recommended By
Special Study?
Estimated Level of Effort
Budget Points
Timing a Concern?
Recommended for PY20 TRM v1.0 Update?

PY20 TRM Updates

Residential Measures

- Faucet Aerator
- Low-Flow Showerhead
- Heat Pump Water Heater
- Whole House Fan
- Solar Attic Fan
- Refrigerator Turn-in

Commercial Measures

- Energy Advantage
- AC & ASHP
- PTAC/PTHP (new)
- Vertical HP (new)
- Water-Source HP (new)

Cross-Cutting

- Codes & Standards Tracking Sheet
- Incorporation of 2019 Baseline Study data
- Clarification of TRB calculation for single vs. dual baseline measures
- Clarification of two baseline periods for dual baseline measures

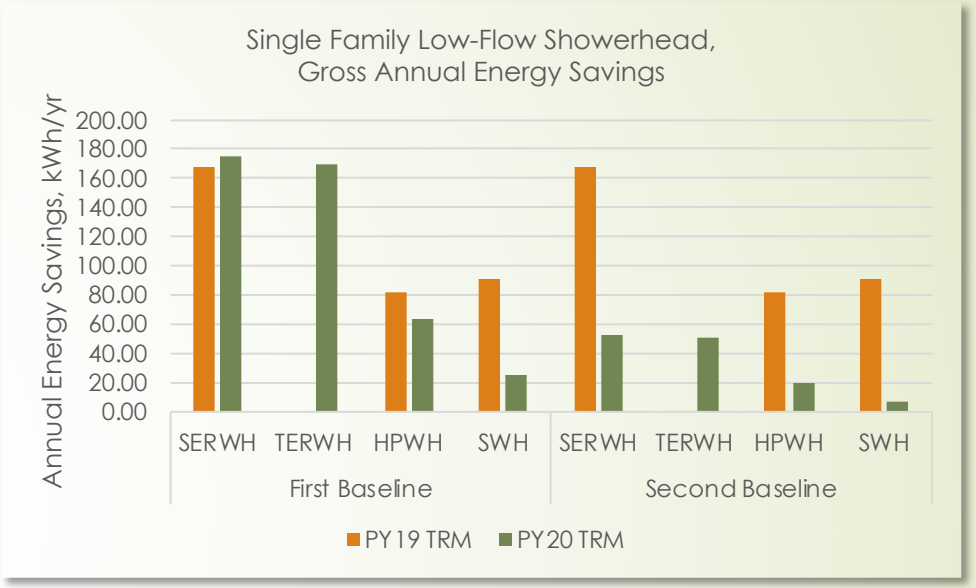
Residential Water Heating

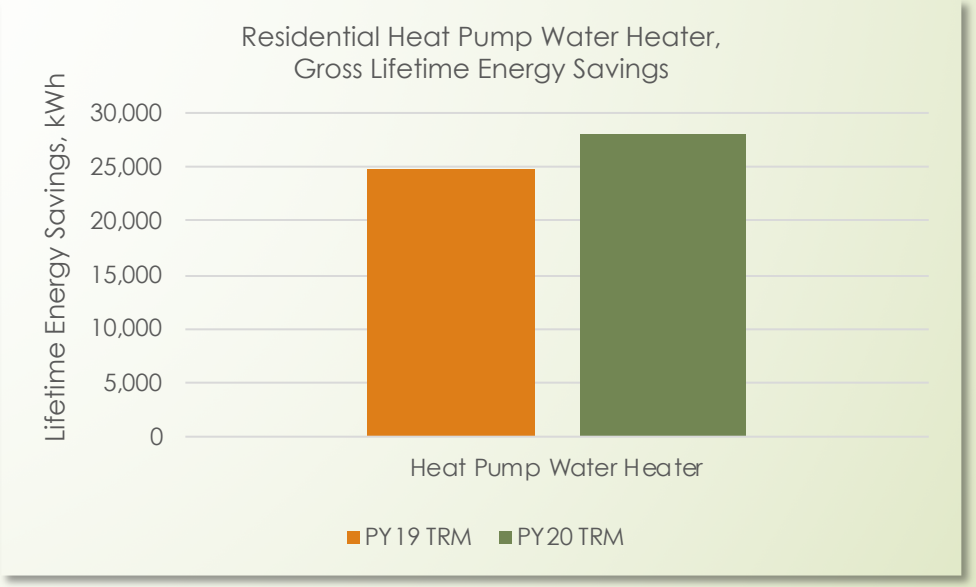
Low-Flow Showerheads & Faucet Aerators

- Affected by new Hawaii appliance standards (effective Jan 1, 2021)
- Updated baseline
  - 1st baseline: Current Federal standards
  - 2nd baseline: New Hawaii standards
- Increased efficiency for HPWH and SWH
- Lifetime kWh savings **decrease** of ~50-90%*

Residential Heat Pump Water Heater

- Updated savings approach
- Increased efficiency for EE case
- Lifetime kWh savings **increase** of ~14%



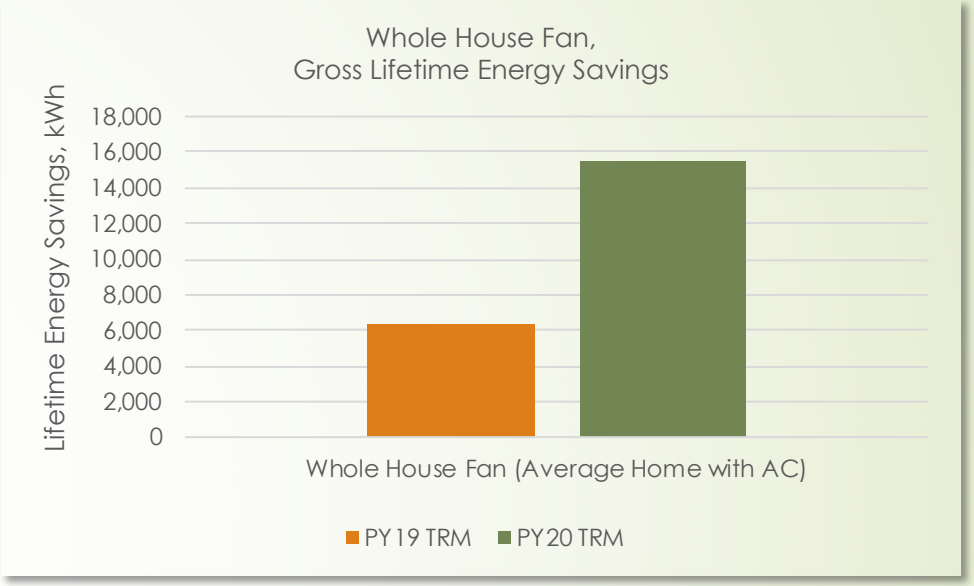


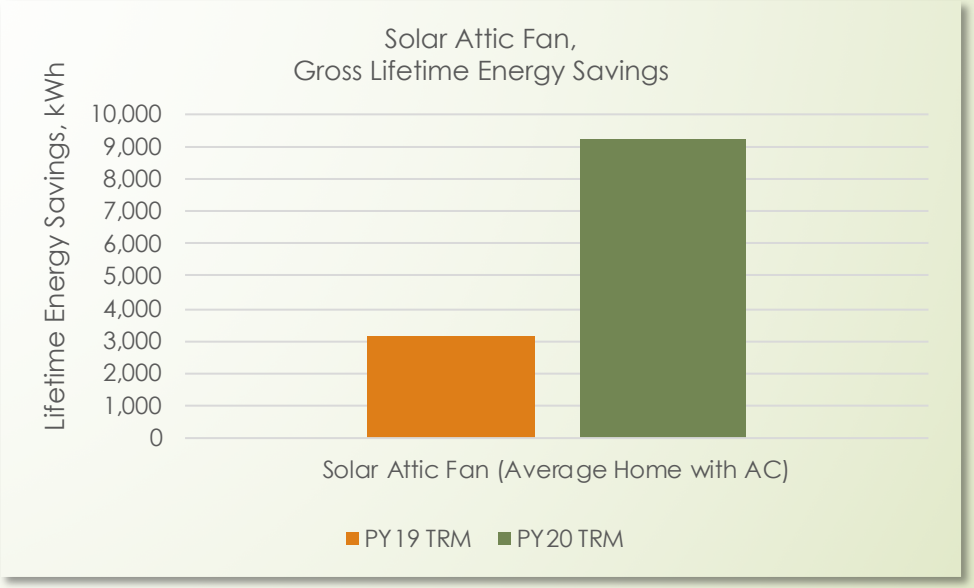
* Depends on type of water heater in home. Storage electric resistance water heater (SERWH), tankless electric resistance water heater (TERWH), heat pump water heater (HPWH), and solar water heater (SWH).

Residential HVAC

Whole House Fan and Solar Attic Fan

- Created Hawaii-specific 8760 hourly models to calculate the savings effects for each measure
- Developed savings for various types of home AC systems
  - Central AC
  - Ductless mini-split
  - Room AC
  - Average home (unknown AC type)*
- Lifetime kWh savings **increase** of
  - ~140% for whole house fan
  - ~190% for solar attic fan



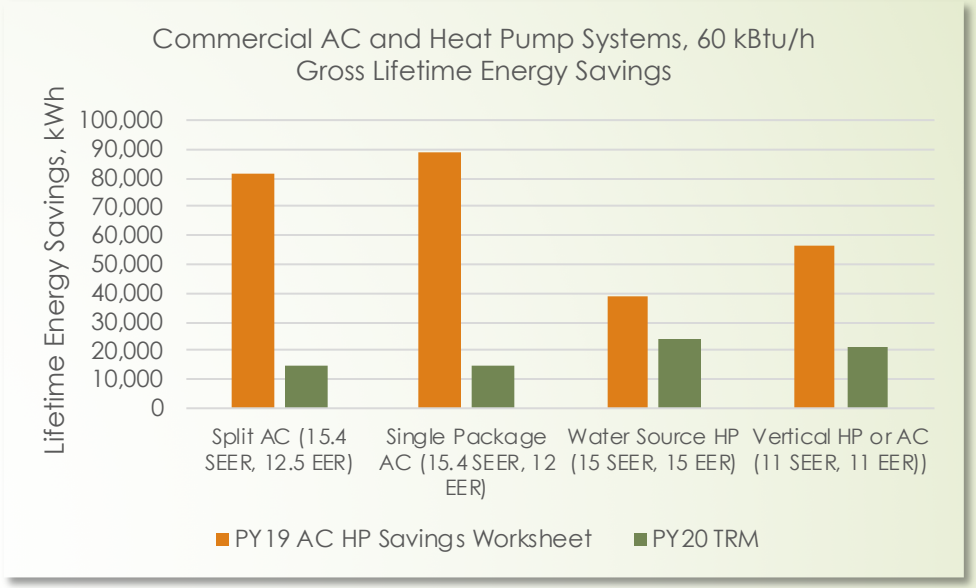


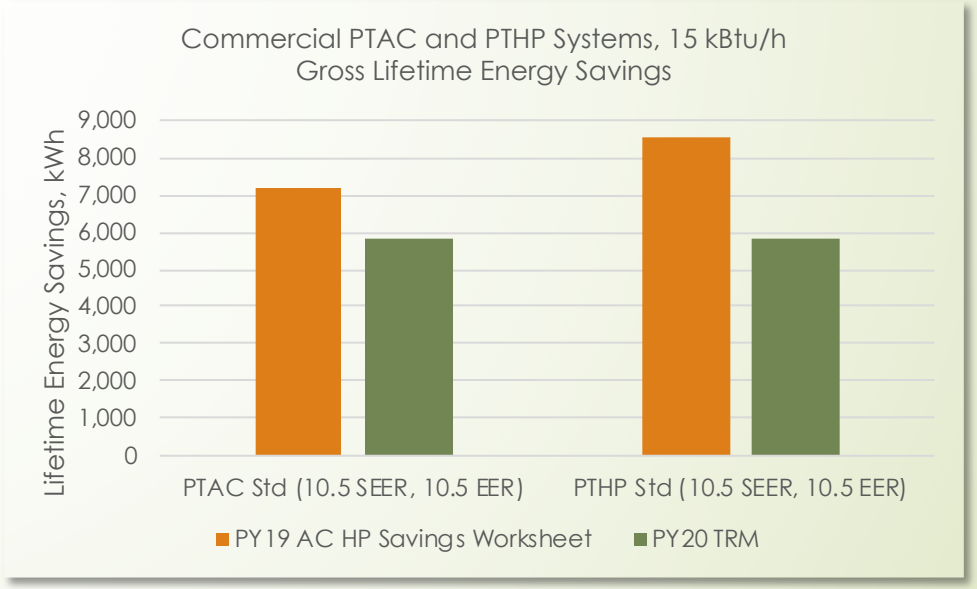
* Used 2019 Hawaii market research to estimate blended savings values (15% CAC, 52% room AC, 33% ductless AC) for average single-family home with AC.

Commercial HVAC

AC and Heat Pump Measures

- Expanded technologies covered
  - PTAC/PTHP
  - Vertical HP
  - Water-Source HP
- Updated baseline conditions to reflect current Codes & Standards (ASHRAE 90.1-2016, IECC 2015)
- Clarified eligibility and documentation requirements
- Clarified when to use custom approach
- Lifetime kWh savings **decrease** of 20-80%*





* For new technologies, PY19 savings for the comparison are from Hawai'i Energy's savings worksheet (not PY19 TRM)
** Savings decrease is highly variable and depends on efficiency of installed system.

Cross-Cutting Updates

- Clarification of TRB calculations
  - Added TRB equations for single baseline and dual baseline measures
  - Added mapping to all dual baseline measures
- Clarification of two baseline periods for dual baseline measures
  - Added savings for each baseline period in the measure entry sheets
  - Affects 8 residential measures and 7 commercial measures
- Updated data using latest Hawaii market research
  - Updated references to 2008 and 2013 data with new 2019 data
  - Affects 10 measures
- Addition of Codes & Standards tracking sheet
  - Listed current C&S, recent C&S updates for the State of Hawaii, and upcoming federal C&S on the books
  - Added mapping of each C&S to applicable technologies and measures in the TRM

Fields in C&S Tracking Sheet
Technology
Hawai'i Energy Measure(s)
Capacity/Size
Current C&S Baseline as of PY20
Upcoming C&S Baseline
Next Effective Date
Source(s)

Key Finding and Implications

- Mid-Year PY19 TRM updates focused on measure additions and clarifications
- PY20 TRM updates focused on
  - Current / upcoming C&S
  - TRB clarity
  - Hawaii conditions
  - Measure additions & expansion
- When updates are applied to the number of measures planned, the overall effect on the portfolio is expected be a small net increase in lifetime energy savings in PY20 and PY21
- Savings reductions are mainly from updates to federal and state minimum efficiency requirements
- Savings increases are from updates to the savings estimation approaches
  - Heat pump water heater updates better align the savings with current ENERGY STAR products
  - Whole house fan and solar attic fan updates use recent survey data on home characteristics and Hawaii-specific load shape analysis to more accurately estimate HVAC savings

Questions or Comments?

Hawaiian Electric

Public Benefit Fund Surcharge

TAG Meeting – February 25, 2020

Consumer Advocate and Hawaiian Electric

Agenda

- Public Benefit Fund Today
- Why should PBF be non-by passable?
- Potential Solutions:
  - Fixed Charge
  - Fixed and Variable Charge
- Next Steps



PBF Surcharge Today

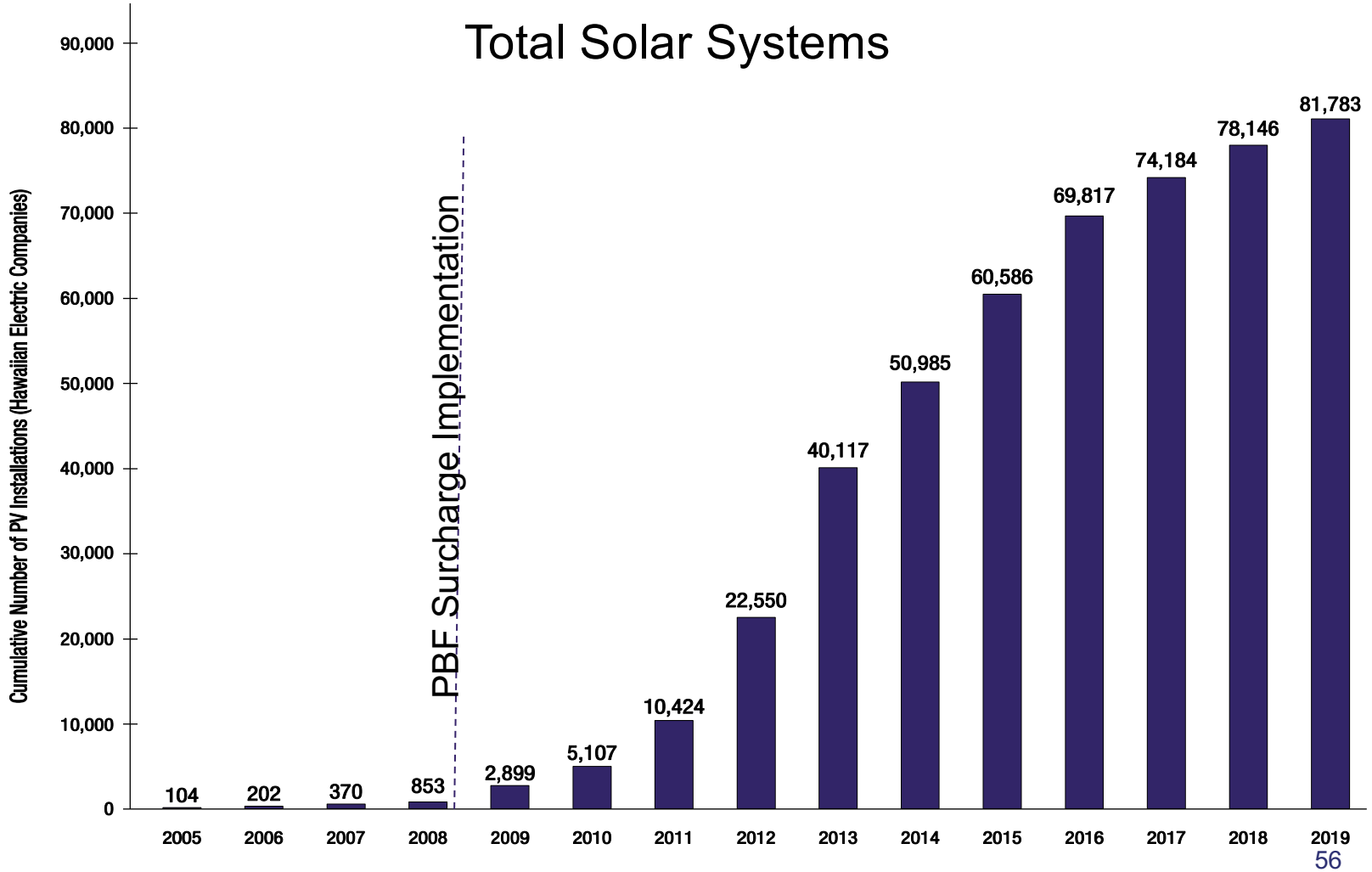
- 2% of Estimated Total Revenues, then reduced by Estimated Green Infrastructure Fee Collections
  - Residential customers: 45%
  - Commercial customers: 55% (rate schedule allocation is based on projected kWh sales)
- Cents per kWh structure
- Same surcharge across all islands
- Minimum bill does not pay per kWh charges
- Methodology in place since 2009

	Revenues (In $000s)
Residential	$17,191.0
Commercial	$22,932.0
Total	**$40,123.0**

	Total $ Collected (In $000s)	¢ Per kWh
R	$17,191.0	0.7437
G	$1,604.6	0.3614
J	$8,731.3	0.3614
P	$12,465.4	0.3614
F	$130.8	0.3614
Comm Total	$22,932.0	
Total	$40,123.0	

Why should PBF be non-by passable?

Customers who can reduce or eliminate their billed energy consumption will **provide either a small contribution or no contribution** to the Public Benefits Fund



Potential Solutions



Status Quo: Variable kWh Charge



Fixed Charge



Fixed and Variable Charge

Fixed Charge

- The Fixed Charge is the same for each customer within a rate schedule
- The Fixed Charge is derived from the number of customers within each rate schedule
- Green Infrastructure Fee is also a fixed charge per customer
- “Total $ Collected” per rate schedule stays the same as today

	Total $ Collected (In $000s)	Fixed Charge
R	$17,191.0	$3.49
G	$1,604.6	$3.05
J	$8,731.3	$67.06
P	$12,465.4	$1,524.63
F	$130.8	$13.47
Comm Total	$22,932.0	
Total	$40,123.0	

Fixed and Variable Charge

- For illustration purposes, the proportion of Total $ Collected is:
  - Fixed Charge is ~29%
  - Variable Charge is ~71%
- The Fixed Charge is the same for each customer within a rate schedule
- The Variable Charge ensures larger energy users contribute a larger proportion to the PBF
- "Total $ Collected" per rate schedule stays the same as today

	Total $ Collected (In $000s)	Fixed $ Collected (In $000s)	Variable $ Collected (In $000s)	Fixed Charge	Variable Charge (¢ Per kWh)
R	$17,191.0	$4,923.4	$12,267.6	$1.00	0.5307
G	$1,604.6	$459.5	$1,145.0	$0.87	0.2579
J	$8,731.3	$2,500.6	$6,230.7	$19.20	0.2579
P	$12,465.4	$3,570.0	$8,895.4	$436.64	0.2579
F	$130.8	$37.5	$93.3	$3.86	0.2579
Comm Total	$22,932.0	$6,567.5	$16,364.5		
Total	$40,123.0	$11,490.9	$28,632.1		
			$40,123.0		

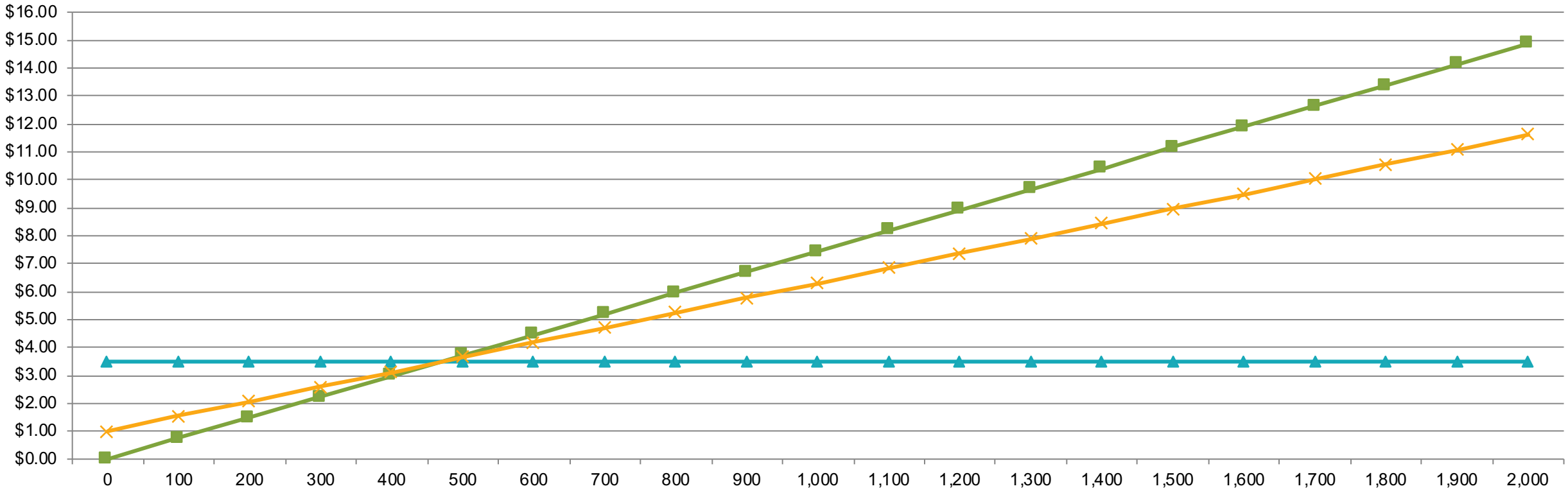
PBF Surcharge Bill Impact

Schedule R	
Status Quo (Variable Per kWh Charge)	
0 kWh	$0.00
400 kWh	$2.97
500 kWh	$3.72
600 kWh	$4.46
2000 kWh	$14.87
Fixed Charge	
0 kWh	$3.49
400 kWh	$3.49
500 kWh	$3.49
600 kWh	$3.49
2000 kWh	$3.49
Fixed & Variable Charge	
0 kWh	$1.00
400 kWh	$3.12
500 kWh	$3.65
600 kWh	$4.18
2000 kWh	$11.61

Schedule G	
Status Quo (Variable Per kWh Charge)	
0 kWh	$0.00
400 kWh	$1.45
500 kWh	$1.81
600 kWh	$2.17
2000 kWh	$7.23
Fixed Charge	
0 kWh	$3.05
400 kWh	$3.05
500 kWh	$3.05
600 kWh	$3.05
2000 kWh	$3.05
Fixed & Variable Charge	
0 kWh	$0.87
400 kWh	$1.90
500 kWh	$2.16
600 kWh	$2.42
2000 kWh	$6.03

Pays less than status quo Pay more than status quo

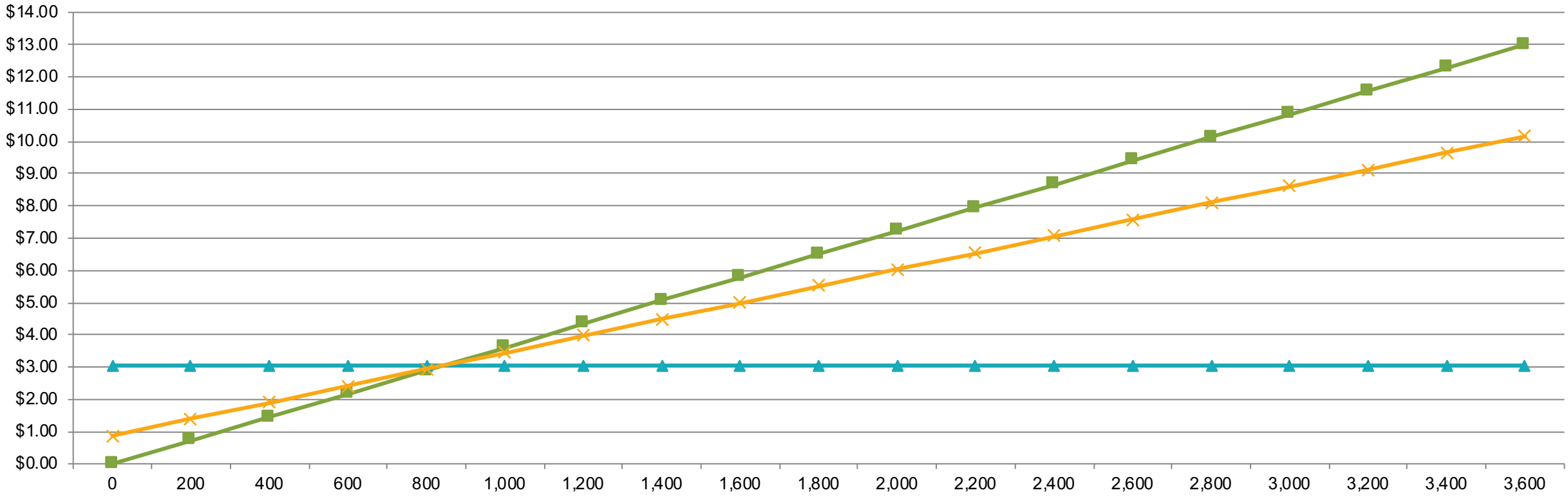
Schedule R PBF Surcharge Bill Impact



kWh Block	0	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	Over 2,000
% of Bills	6.0%	8.2%	11.6%	12.9%	12.3%	10.7%	8.6%	6.7%	5.2%	3.9%	3.0%	2.3%	1.8%	1.4%	1.1%	0.8%	0.6%	0.5%	0.4%	0.3%	0.3%	1.4%
Cum. % of Bills	6.0%	14.2%	25.8%	38.7%	51.0%	61.6%	70.2%	76.9%	82.1%	86.1%	89.1%	91.4%	93.2%	94.6%	95.6%	96.5%	97.1%	97.6%	98.0%	98.3%	98.6%	100.0%

Status Quo: Per Kwh Charge Fixed Charge Fixed and Variable Charge

Schedule G PBF Surcharge Bill Impact



kWh Block	0	200	400	600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400	3600	Over 3600
% of Bills	6.5%	28.6%	16.5%	10.5%	7.5%	5.1%	4.2%	3.2%	2.5%	2.2%	1.9%	1.6%	1.4%	1.2%	1.1%	1.0%	0.9%	0.7%	0.7%	2.7%
Cum. % of Bills	6.5%	35.1%	51.6%	62.1%	69.6%	74.7%	78.9%	82.0%	84.5%	86.8%	88.7%	90.3%	91.7%	92.9%	94.0%	95.0%	95.8%	96.6%	97.3%	100.0%

Status Quo: Per Kwh Charge Fixed Charge Fixed and Variable Charge

Considerations

Fixed Charge

- The Fixed Charge is the same for each customer within a rate schedule
- The Fixed Charge is derived from the number of customers within each rate schedule
- Green Infrastructure Fee is also a fixed charge per customer

Fixed and Variable Charge

- For illustration purposes, the proportion of Total $ Collected is:
  - Fixed Charge is ~29%
  - Variable Charge is ~71%
- The Fixed Charge is the same for each customer within a rate schedule
- The Variable Charge ensures larger energy users contribute a larger proportion to the PBF



Next Steps



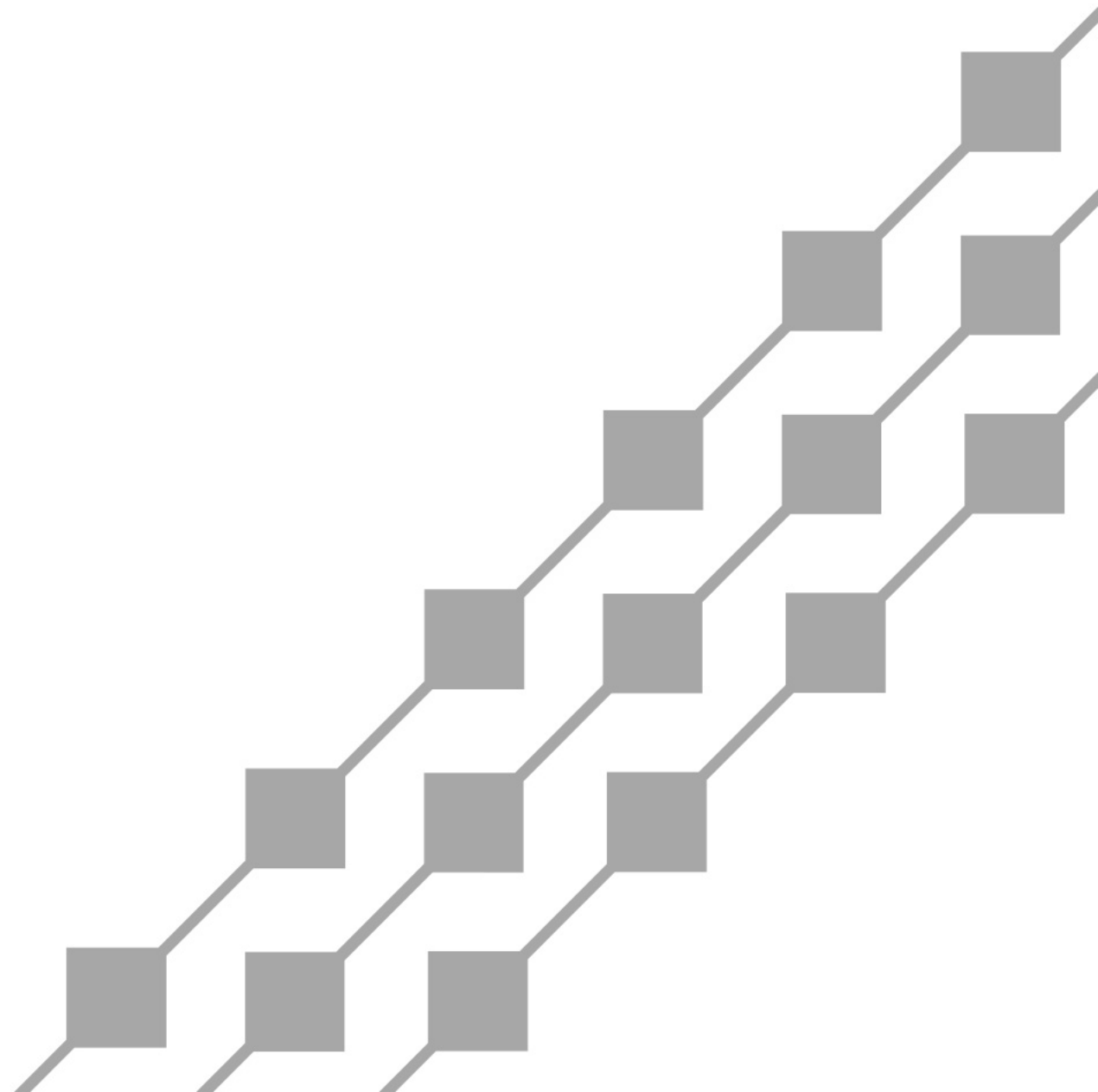
- Email Jennifer.baker@hawaiianelectric.com: 3/10
- DER Stakeholder meeting: 3/23



Mahalo for your time.

Any questions?

Appendix



Hawaiian Electric, Hawai'i Electric Light & Maui Electric Public Benefits Fund (PBF) Surcharge Funding - 7/1/2019 to 6/30/2020 ($000's)

Line	Source	Description	Hawaiian Electric	Hawai'i Electric Light	Maui Electric	TOTAL
L1	Att. 2: Pgs 1,2,3	Estimated Total Revenues, 7/2019 - 6/2020	$1,787,246	$409,230	$363,679	$2,560,155
L2		PBF Surcharge = 2.0% of Revenues				2.0%
L3	=L1xL2	Estimated PBF				$51,203

Hawaiian Electric, Hawai'i Electric Light & Maui Electric Residential PBF Surcharge

			Hawaiian Electric	Hawai'i Electric Light	Maui Electric	Total
L4		Residential portion of PBF (%)				45%
L5	=L3xL4	Estimated Residential PBF				$23,041
L6	Att. 2: Pg 4	Hawaiian Electric PBF Reconciliation (4/2018- 3/2019)				($634)
L7	Att. 2: Pg 5	Hawai'i Electric Light PBF Reconciliation (4/2018 - 3/2019)				($128)
L8	Att. 2: Pg 6	Maui Electric PBF Reconciliation (4/2018 - 3/2019)				($243)
L9	=sum(L6:L8)	Total 4/2018 - 3/2019 Residential Reconciliation				($1,004)
L10	=L5+L9	Total Residential PBF				$22,037
L11	Att. 3, Line 44, Cols D and E	Estimated Green Infrastructure Fee Collections, 7/2019- 6/2020				**$13,208**
L12		Residential Green Infrastructure Fee %				45%
L13	=L11 x L12	Residential Portion of Green Infrastructure Fee Collections				$5,944
L14	= L10 - L13	Residential PBF Collections after Green Infrastructure Fee, Before Taxes				$16,093
L15	= 1/(1-.06385)	Revenue Taxes Adjustment Factor				106.82%
L16	L14 x L15	Residential PBF Collections after Green Infrastructure Fee and Taxes				$17,191
L17	Att. 2: Pgs 1,2,3	Residential Sales est. for 7/2019 - 6/2020 (GWh)	1543.2	408.4	359.9	2311.6
L18	=L16/(L17x10)	Estimated Residential PBF Surcharge for 7/2019 - 6/2020 (cents per kWh)				**0.7437**
L19	=L17xL18x10	Estimated Residential PBF Collections	$11,477	$3,038	$2,677	$17,192

Hawaiian Electric, Hawai'i Electric Light & Maui Electric Commerical & Industrial (C&I) PBF Surcharge

			Hawaiian Electric	Hawai'i Electric Light	Maui Electric	TOTAL
L20		C&I portion of PBF (%)				55%
L21	=L3xL20	Estimated C&I PBF				$28,162
L22	Att. 2: Pg 4	Hawaiian Electric PBF Reconciliation (4/2018- 3/2019)				$523
L23	Att. 2: Pg 5	Hawai'i Electric Light PBF Reconciliation (4/2018 - 3/2019)				$43
L24	Att. 2: Pg 6	Maui Electric PBF Reconciliation (4/2018 - 3/2019)				$4
L25	=sum(L22:L24)	Total 4/2018 - 3/2019 C&I Reconciliation				$570
L26	=L21+L25	Total C&I PBF				$28,732
L27	=1 - L12	Commercial Green Infrastructure Fee %				55%
L28	=L11 x L27	Estimated Commercial Portion of Green Infrastructure Fee				$7,264
L29	=L26 - L28	Commercial PBF Collections after Green Infrastructure Fee before Taxes				$21,468
L30	=L15	Revenue Taxes Adjustment Factor				106.82%
L31	=L29 x L30	Commercial PBF Collections after Green Infrastructure Fee after Taxes				$22,932
L32	Att. 2: Pgs 1,2,3	Total Sales estimate for 7/2019 - 6/2020 (GWh)	6,545.6	1,062.5	1,049.4	8,657.4
L33	=L32-L17	C&I Sales est. for 7/2019 - 6/2020 (GWh)	5,002.4	654.0	689.5	6,345.9
L34	=L31/(L33x10)	Estimated C&I Surcharge for 7/2019 - 6/2020 (cents per kWh)				**0.3614**
L35	=L33xL34x10	Estimated C&I PBF Collections	$18,079	$2,364	$2,492	$22,934

Letter from: K Katsura To: Commission Re: Docket No. 2007-0323, Attachment 1, Page 1 of 4, filed April 30, 2019.

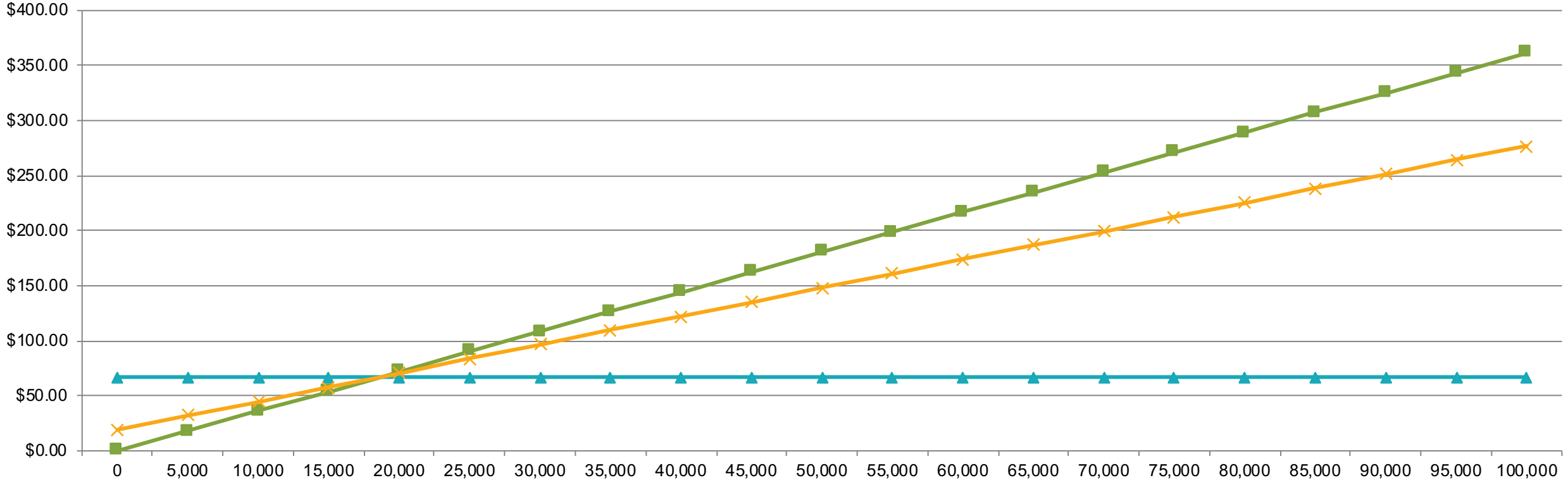
PBF Surcharge Bill Impact

Schedule J	
Status Quo (Variable Per kWh Charge)	
0 kWh	$0.00
5,000 kWh	$18.07
10,000 kWh	$36.14
15,000 kWh	$54.21
20,000 kWh	$72.28
Fixed Charge	
0 kWh	$67.06
5,000 kWh	$67.06
10,000 kWh	$67.06
15,000 kWh	$67.06
20,000 kWh	$67.06
Fixed & Variable Charge	
0 kWh	$19.20
5,000 kWh	$32.09
10,000 kWh	$44.99
15,000 kWh	$57.88
20,000 kWh	$70.78

Schedule P	
Status Quo (Variable Per kWh Charge)	
0 kWh	$0.00
100,000 kWh	$361.40
500,000 kWh	$1,807.00
1,000,000 kWh	$3,614.00
2,000,000 kWh	$7,228.00
Fixed Charge	
0 kWh	$1,524.63
100,000 kWh	$1,524.63
500,000 kWh	$1,524.63
1,000,000 kWh	$1,524.63
2,000,000 kWh	$1,524.63
Fixed & Variable Charge	
0 kWh	$436.64
100,000 kWh	$694.52
500,000 kWh	$1,726.02
1,000,000 kWh	$3,015.40
2,000,000 kWh	$5,594.16

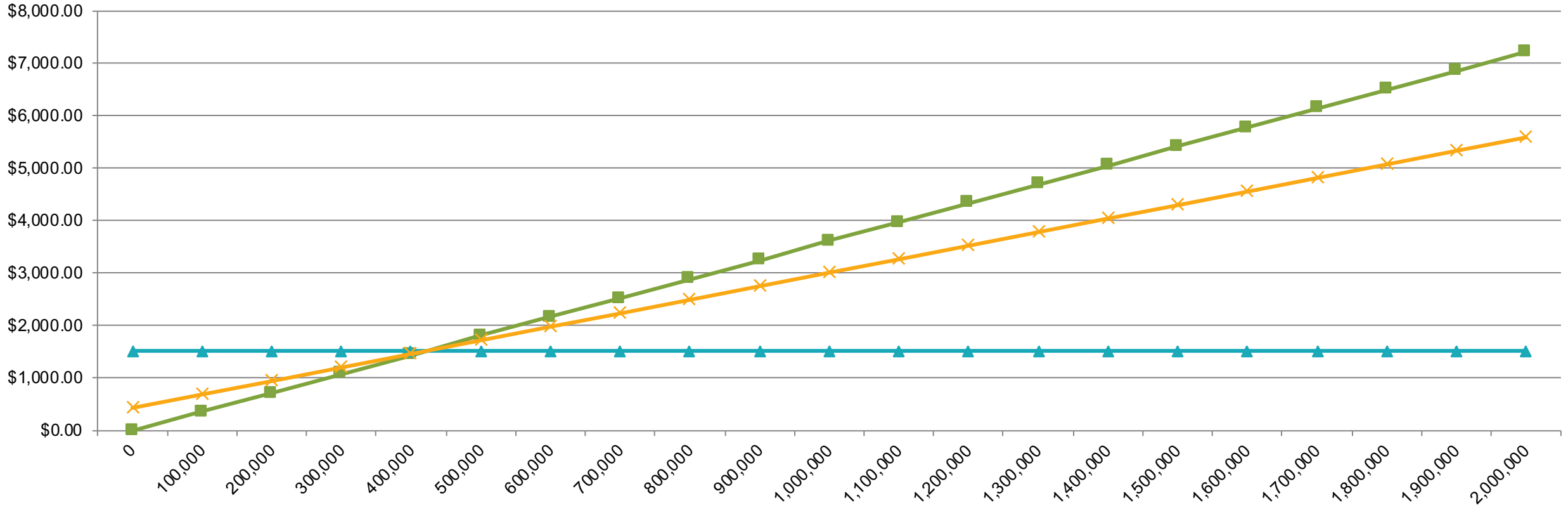
Pays less than status quo Pay more than status quo

Schedule J PBF Surcharge Bill Impact



kWh Block	0	5k	10k	15k	20k	25k	30k	35k	40k	45k	50k	55k	60k	65k	70k	75k	80k	85k	90k	95k	100k	Over 100k
% of Bills	2.0%	17.7%	35.0%	13.6%	7.5%	5.4%	4.0%	2.4%	1.9%	1.6%	1.3%	1.1%	0.9%	0.7%	0.6%	0.5%	0.4%	0.4%	0.4%	0.3%	0.3%	2.1%
Cum. % of Bills	2.0%	19.7%	54.6%	68.3%	75.8%	81.1%	85.1%	87.5%	89.4%	91.0%	92.3%	93.4%	94.3%	95.0%	95.6%	96.1%	96.5%	96.9%	97.3%	97.6%	97.9%	100.0%

Schedule P PBF Surcharge Bill Impact



kWh Block	0	100k	200k	300k	400k	500k	600k	700k	800k	900k	1m	1.1m	1.2m	1.3m	1.4m	1.5m	1.6m	1.7m	1.8m	1.9m	2m	Over 2m
% of Bills	0.1%	15.3%	31.6%	24.1%	10.6%	5.8%	3.3%	2.3%	1.6%	1.3%	0.7%	0.7%	0.6%	0.6%	0.3%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.4%
Cum. % of Bills	0.1%	15.4%	47.0%	71.1%	81.7%	87.5%	90.9%	93.2%	94.8%	96.1%	96.8%	97.5%	98.1%	98.7%	99.0%	99.1%	99.2%	99.3%	99.3%	99.4%	99.6%	100%

Questions or Comments?



Thank You