

Assessment and Benchmarking of CPS Energy's STEP Program

Full Report

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FEBRUARY 14, 2022



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1- STEP Overview and Significance

This section provides an overview of the STEP program to date, achievements of the program and its relevance given the current industry trends

STEP in a Nutshell

The Save for Tomorrow Energy Plan (STEP) was established in 2009 by the City of San Antonio as an energy conservation program with the goal of saving 771 MW of electricity (~capacity of a large power plant) from 2009 to 2020

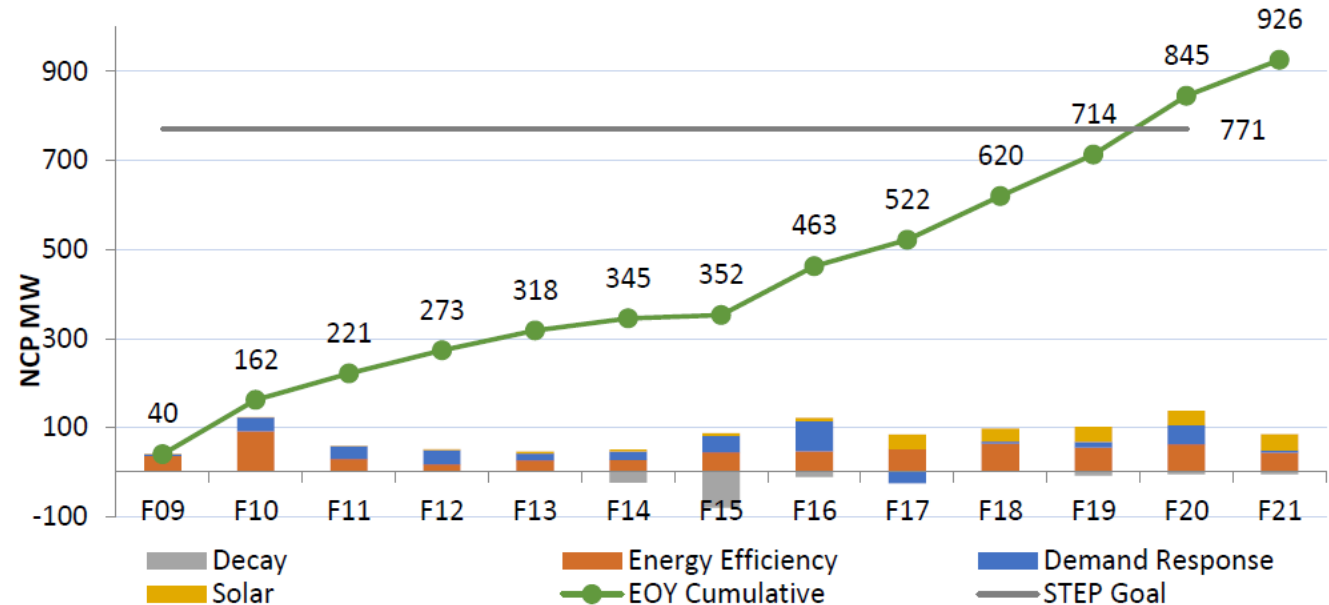
- **The STEP program achieved its initial goal in FY2020**
- **Evolving Objectives**
 - While still driving energy efficiency and peak demand savings, STEP is also used as vehicle in the San Antonio area to advance energy affordability through a portfolio of consumer-facing energy programs such as energy efficiency, demand response, and solar
 - STEP is an important tool to improve resiliency in the face of extreme weather events (i.e. demand response programs dispatched during the Winter Storm Uri provided system relief) and can be further expanded to address winter peak needs
- **Electrification and the Clean Energy Transition**
 - STEP will need to continuously innovate to ease the grid impacts of electrification and support the clean energy transition
 - Peer utilities, regulators, and community groups all view customer-facing energy conservation and demand response programs as a cost-effective way to meet energy and capacity needs, benefitting both the utility and the customer

STEP in a Nutshell (cont'd)

STEP saved 926 MW of capacity (exceeding the 771 MW target) since the inception of the program in 2009. This means \$657 million in avoided capacity costs for CPS Energy customers as of 2021

- STEP is a portfolio of 17 different residential & commercial customer EE, DR and solar programs
- STEP averaged a demand reduction of 71 MW per year between FY 2009 and FY 2021
- STEP averaged a net energy savings of 151.5 GWh per year during this same time period, representing 0.7% of San Antonio’s total energy sales
- About 19,000 customers received solar rebates between FY 2017 and FY2021
- In addition to energy reduction, STEP is estimated to have cumulatively generated 7,500 job-years and \$312 million in labor income between FY 2009 and FY 2019

Cumulative demand reduction, FY 2009 – FY 2021



Note: Measures that were installed but have since reached the end of their useful lives or are otherwise rendered ineligible are counted as decay.

Sources and Notes: CPS Energy, “Evaluation, Measurement, and Verification of CPS Energy’s FY 2020 DSM Programs,” June 24, 2020; CPS Energy, “Evaluation, measurement, and Verification of CPS Energy’s FY 2021 DSM Portfolio,” May 20, 2021; ICF, CPS Energy, “Save for Tomorrow Energy Plan (“STEP”) Program Review”, November 2019. Solar rebates are from “[Rates Advisory Committee: STEP Program Details](#),” CPS Energy, September 2021. The avoided capacity costs are estimated by assuming a 926 MW industrial frame Combustion Turbine at \$709/kW ([EIA Cost and Performance Characteristics of New Generating Technologies, AEO 2021](#)). Net energy savings derived by converting program-level gross energy savings at meter to savings at source using energy loss factor of 5.08%.

STEP Residential and Commercial Energy Efficiency (EE) Initiatives

STEP is a comprehensive portfolio of programs aiming to create energy and capacity savings for the system and help customers achieve bill savings

| Area | Program | Description and Purpose |
|---|---|---|
| Residential Energy Efficiency (EE) | Weatherization (Casa Verde) | Casa Verde provides free weatherization upgrades for LMI customers (insulation, air sealing, duct sealing, and LED bulbs) |
| | Home Efficiency Rebate | Incentives and rebates for heat pumps, high-efficient central/room air conditioners, pool pumps, and insulation |
| | Home Energy Assessments | Free in-person assessments to educate customers on upgrading outdated air conditioners/heat pumps |
| | Cool Roof | Rebates and incentives for customers to upgrade insulation and install roof cooling products |
| | New Home Construction | Incentives for developers to build homes 15+% more energy efficient than San Antonio building codes |
| | Schools 2 Home | Incorporates EE education into 6 th grade curriculum and provides take-home EE kits for students |
| | Retail Partnerships | Point of sale incentives on energy efficient lighting and air conditioners at participating retailers in underserved areas |
| Commercial EE | Commercial, Industrial, Schools, Small Business | Assessments and energy planning workshops to provide schools, government entities, and businesses with technical assistance, highlight rebate opportunities, and identify energy-saving upgrades to equipment |

STEP Demand Response, Solar, and EV Initiatives

| Area | Program | Description and Purpose |
|-----------------------------|--------------------------------------|--|
| Demand Response (DR) | Commercial and Industrial DR | Incentives for business based on their ability to lower energy during 1 to 3-hour curtailment periods |
| | Smart Thermostat, Thermostat Rewards | Free smart thermostats that cycle off compressor during summer peak demand Rebates for customers who purchase an approved thermostat and enroll in the DR program |
| | Power Players | Allows customers to compare energy consumption with their neighbors during peak hours to encourage reduction in peak demand |
| Solar | Solar Rebates | Rebates to customers to install home or business solar systems |
| | Big Sun Solar (Community Solar) | Customers can purchase panels at community solar park and receive energy credits based, designed to support renters, LMI customers, and customers who live in shaded or historical areas |
| Electric Vehicles | Smart and Off-Peak Rewards | Rebates to customers who pause EV charging during peak demand and charge during off-peak hours |

STEP is an important “customer-facing” initiative to keep up with the changing times

We are witnessing several key trends in the industry:

- Clean energy goals and aspirations
- Transportation and building electrification
- Increasing need for load flexibility to integrate renewables and mitigate infrastructure investments
- Pressure to maintain affordability in the face of these macro developments
- Increasing customer energy awareness and interest in distributed generation and clean energy
- Increasing threats of dis-intermediation by third parties (if the incumbent utility falls behind in innovation, other market participants will fill-in the void)
- Increasing need for customer empowerment through new programs and innovative rates

Save for Tomorrow Energy Plan (STEP) is one of the ways CPS Energy is keeping up with these trends shaping the industry

Public Perception of the STEP Initiative

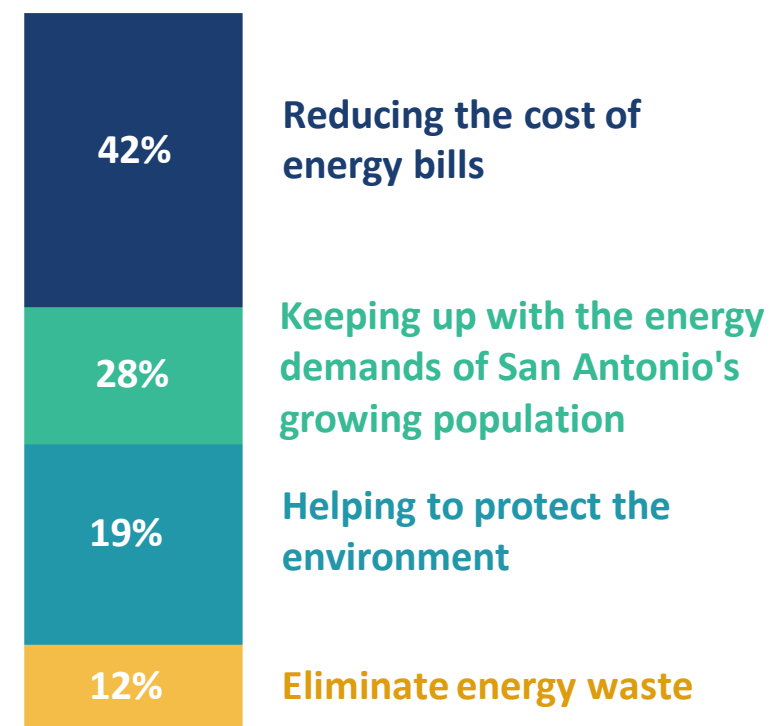
CPS Energy residential and business customers broadly support measures to make their home or business more energy efficient

- 95% of residential customers and 93% of business customers indicate it is important to know their home/business is energy efficient
- Of these residential customers, the majority (71%) cite “saving on their utility bill” as the primary benefit of energy efficiency

There is a general lack of awareness of the STEP program, but customers display interest in using STEP to reduce energy bills and meet energy reduction goals

- Only 54% of residential customers and 50% of business customers are aware of the STEP program
- Of the residential customers who haven’t participated in the STEP program, 72% have not participated because of “lack of awareness of programs”
- Nearly 40% of customers are willing to pay the current price of \$3-\$5/month to continue the STEP program, even without being prompted of the program’s cost-saving benefits

Survey Respondents’ Take on the Primary Benefit of the STEP program



Sources and Notes: Survey of 801 CPS Energy residential customers, original question: “What do you feel should be the primary benefit of the STEP program?”

Recap

1- STEP has delivered in its original mission to avoid a power plant over the past decade and continues to deliver energy and capacity savings beyond that initial goal

- These energy and capacity savings are avoided costs that would otherwise be contributing to future rate increases
- Since the overall portfolio of the STEP program is cost effective from a program administrator cost perspective (will be discussed later in the deck), the benefits of the STEP exceed the costs incurred by CPS Energy, leading to net savings for the customers

2- Every major and innovative utility in the country is maintaining or expanding their customer-facing programs (comparable to STEP) given the following trends:

- Clean energy goals and the retirements of coal units
- Mitigating the impacts of (expected) increased electrification
- Affordability concerns given the investment requirements on the aging grid
- Customer empowerment

3- CPS Energy customers' awareness of STEP programs is low and can be improved

Board Member Question Tracker

| Focus Area | Board Member | Question/Comment | Addressed |
|---|-----------------------|---|-----------|
| 1- STEP Overview and Significance | Former Trustee Kelley | Declare success (STEP goal was achieved; a power plant was avoided) and move on. | Yes |
| | Mayor Nirenberg | Define our next goal for STEP. What is it we are trying to achieve? | Yes |
| 2- STEP Cost Effectiveness | Trustee Steen | Breakout the cost of STEP on customer bills. Looking for additional transparency as customers can't see how much they are paying for STEP. | |
| | Mayor Nirenberg | 1) Illustrate everything in our fuel adjustment, breakout fuel cost from all sources including coal, nuclear, natural gas and renewables, 2) Put together goals, benchmarks, customer sentiment, and cost of program vs. impact of program. | |
| | Trustee Gonzalez | Do an assessment of the program to include conservation, equitable investments, and safety; ii) Evaluate and have high-level criteria for the program | |
| | Chair Dr. Mackey | Do a lessons learned and ROI analysis on the STEP program | |
| 3- Peer Utility Benchmarking | Trustee Gonzalez | Pivot the program to be more innovative, so programs are not stale | |
| 4- Recommendations for the Future of STEP | Trustee Steen | Eliminate or rescale the STEP program and use the savings to relieve financial stress from Winter Storm Uri | |
| | Former Trustee Kelley | Do a clean sheet, deep dive analysis to determine if the STEP program still makes sense after twelve years. | |
| | Chair Dr. Mackey | Do we still need it, are we meeting the needs today? | |

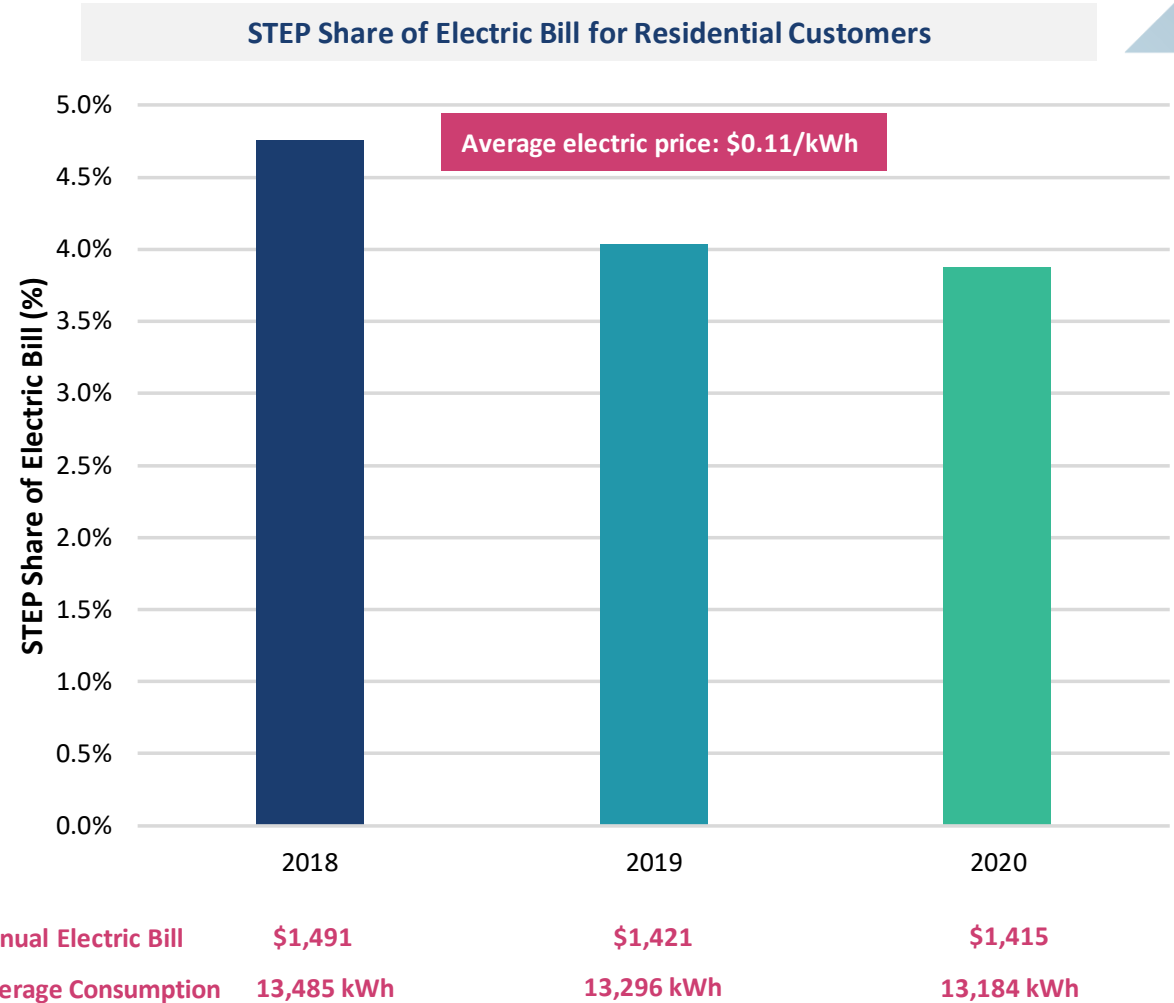
2- STEP Cost-Effectiveness

This section reviews the cost-effectiveness of the STEP program and its impact on reducing customer bills

STEP Program Cost Recovery from Residential Customer Bills

In 2019, the average residential CPS Energy residential customer paid **\$57 for STEP** or about **4%** of their annual electricity bill

| Recovery Period | STEP (Residential Impact per MWh) |
|-----------------------|-----------------------------------|
| July 2017 – June 2018 | \$5.41 |
| July 2018 – June 2019 | \$4.14 |
| July 2019 – June 2020 | \$3.53 |
| July 2020 – June 2021 | \$3.84 |



Sources: CPS Energy, “[Understanding Your CPS Energy Bill](#),” Accessed on January 14, 2022 & “[CPS Energy Quarterly Report to the City of San Antonio](#),” Accessed on January 28, 2020.

Notes: For each year, the STEP share of the electric bill was computed using the following equation: ((Average Customer Usage) * (STEP Charge in MWh + Regulatory Charges)) / (Average Customer Bill). Regulatory charges are \$0.48/MWh.

Break Down of Fuel Adjustment Charge for Electric Bills

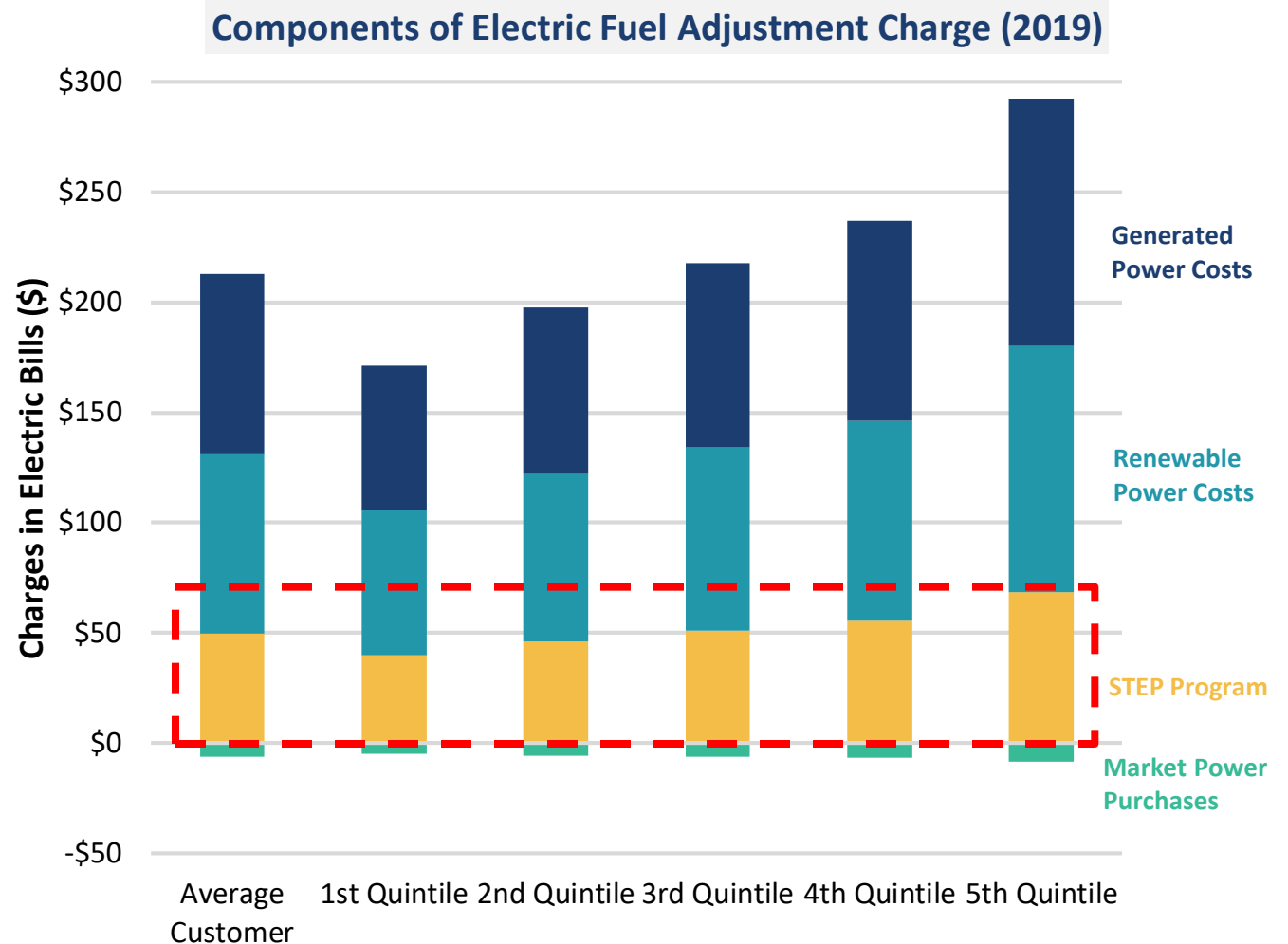
The STEP program cost is recovered from a portion of the **Fuel Adjustment Charge**

- The average Fuel Adjustment Charge was **\$0.016/kWh** for electricity customers in the residential rate class in 2019

| Program Description | Average Electric Fuel Adjustment Charge Distribution (2019) |
|------------------------|---|
| Generated | 39.5% |
| Renewable | 39.5% |
| Market Power Purchases | -3.0% |
| STEP | 24.0% |

In 2019, the average customer paid about **\$207** annually to cover the fuel adjustment charge, comprising 15% of their electric bill

- 1st income quintile customers paid 27% less towards STEP programs compared to the 5th quintile customers



Sources and Notes: The estimated average electric fuel adjustment charge and program share is provided by CPS Energy for 2019. Negative Market Power Purchases represent credits from ERCOT.

Summary of Widely Used Cost-Effectiveness Tests

TRC and PAC Test are the most commonly used tests out of five widely established tests to gauge the cost effectiveness of EE and DR programs

- A Benefit/Cost Ratio of 1 and above indicates a cost effective portfolio

| Cost-Effectiveness Test | Perspective | Key Question | Benefits | Costs |
|--|-----------------------|--|---|--|
| Participant Cost Test (PCT) | Participants | Is the participant better off? | <ul style="list-style-type: none"> • Bill Decrease • Customer Incentives | <ul style="list-style-type: none"> • Program Costs (Participant) • Participation Fees |
| Total Resource Cost (TRC) Test | Customers and utility | Are the system costs lowered? | <ul style="list-style-type: none"> • Avoided supply-side costs | <ul style="list-style-type: none"> • Program Costs (Participant and Utility) |
| Ratepayer Impact Measure (RIM) Test | Non-participants | Are rates lowered? | <ul style="list-style-type: none"> • Avoided supply-side costs • Participant Fees | <ul style="list-style-type: none"> • Revenue loss • Customer Incentives • Program Costs (Utility) |
| Program Administrator Cost (PAC) Test | Utility | Are revenue requirements lowered? | <ul style="list-style-type: none"> • Avoided supply-side costs • Participant Fees | <ul style="list-style-type: none"> • Customer Incentives • Program Costs (Utility) |
| Societal Cost Test (SCT) | Society | Are societal costs lower? | <ul style="list-style-type: none"> • Avoided societal costs, inclusive of supply-side costs and social externalities | <ul style="list-style-type: none"> • Program Costs (Participant and Utility) |

Source: For further discussion of the cost-effectiveness tests, see: California Public Utilities Commission, "California Standard Practice Manual," October 2001.

STEP Program According to the PAC Test

CPS Energy’s STEP portfolio provides 3.3x the benefits relative to costs with solar and 2.7x the benefits without solar

- CPS Energy’s STEP portfolio provided about \$187 million in benefits and only \$57 million in program administrator costs in FY2021
- Solar program has the highest benefit-to-cost ratio (4.7)
- The weatherization program is the only program with a benefit-to-cost ratio under 1

Strong B/C ratios from the STEP program means that the program is highly cost effective leading to lower future revenue requirements for CPS Energy

STEP Program Cost-Effectiveness (2021)

| Program | PAC Test | | |
|-------------------------|--------------------|-----------------|-----------------|
| | Benefits (\$ M) | Costs (\$ M) | BCR |
| [1] | [2] | [3] | [4] = [2] / [3] |
| Energy Efficiency | \$82.8 | \$32.0 | 2.59 |
| Residential EE | \$31.1 | \$10.2 | 3.05 |
| Commercial EE | \$45.4 | \$14.5 | 3.13 |
| Weatherization | \$6.3 | \$7.3 | 0.87 |
| Demand Response | \$25.3 | \$8.6 | 2.96 |
| Solar Energy | \$78.4 | \$16.6 | 4.74 |
| BCR, No Solar | \$108.1 | \$40.5 | 2.67 |
| BCR, Incl. Solar | \$186.5 | \$57.1 | 3.27 |

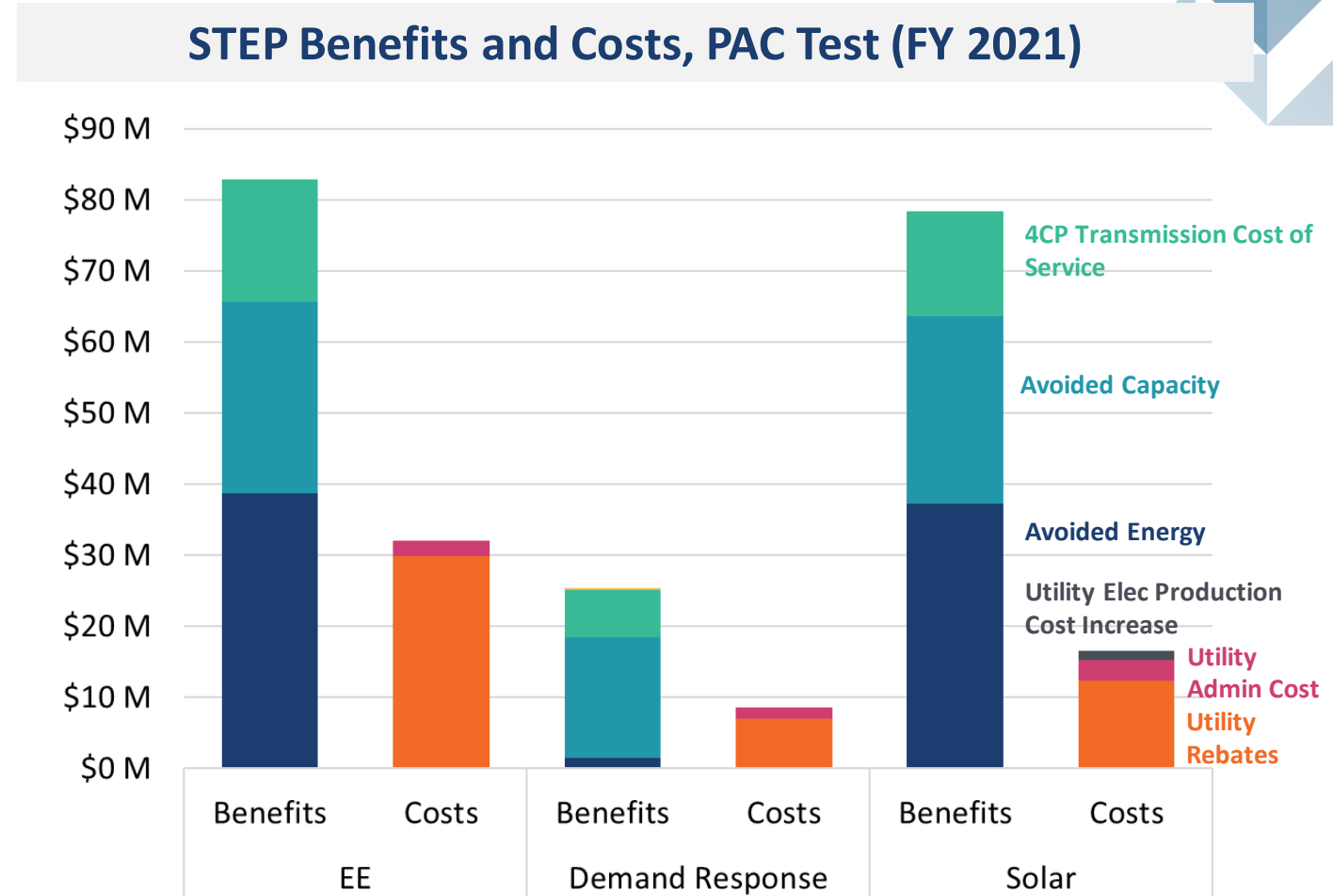
Sources and Notes: Data provided by Frontier. Solar costs are net of the Investment Tax Credit.

STEP Program According to the PAC Test (cont'd)

STEP benefits exceed the costs for each of the EE, DR and Solar programs, based on the PAC Test

- **Benefits:** EE produces the largest avoided energy, avoided capacity, and 4CP transmission cost of service benefits, followed by solar
- **Costs:** Utility rebates represent the highest share of costs

The solar program provides the highest benefit-to-cost ratio (4.7) compared to EE (2.6) and Demand Response (3.0)



Sources and Notes: Data provided by Frontier.

STEP Program According to the TRC Test

CPS Energy’s STEP portfolio is cost-effective from a TRC perspective

- However, the B/C ratio is materially lower compared to the PAC test, because TRC test takes into account the total cost of the measures regardless of who pays for them
- Solar program is reducing the cost-effectiveness of the portfolio because TRC accounts for the total installed cost of the solar system, not just the utility rebates. This implies that the total cost of these systems are not covered by the benefits they create for the system
- The B/C ratio for the Commercial EE, Weatherization, and Solar Energy programs are under 1
- Demand response program has the highest B/C ratio, implying the largest reduction potential impact on the system costs

STEP Program Cost-Effectiveness (2021)

| Program | TRC Test | | |
|-------------------------|----------------|----------------|-----------------|
| | Benefits | Costs | BCR |
| | (\$ M) | (\$ M) | |
| [1] | [2] | [3] | [4] = [2] / [3] |
| Energy Efficiency | \$82.8 | \$70.3 | 1.18 |
| Residential EE | \$31.1 | \$16.1 | 1.93 |
| Commercial EE | \$45.4 | \$47.0 | 0.97 |
| Weatherization | \$6.3 | \$7.3 | 0.87 |
| Demand Response | \$25.3 | \$3.3 | 7.56 |
| Solar Energy | \$78.4 | \$112.8 | 0.69 |
| BCR, No Solar | \$108.1 | \$73.7 | 1.47 |
| BCR, Incl. Solar | \$186.5 | \$186.5 | 1.00 |

Sources and Notes: Data provided by Frontier. Solar costs are net of the Investment Tax Credit.

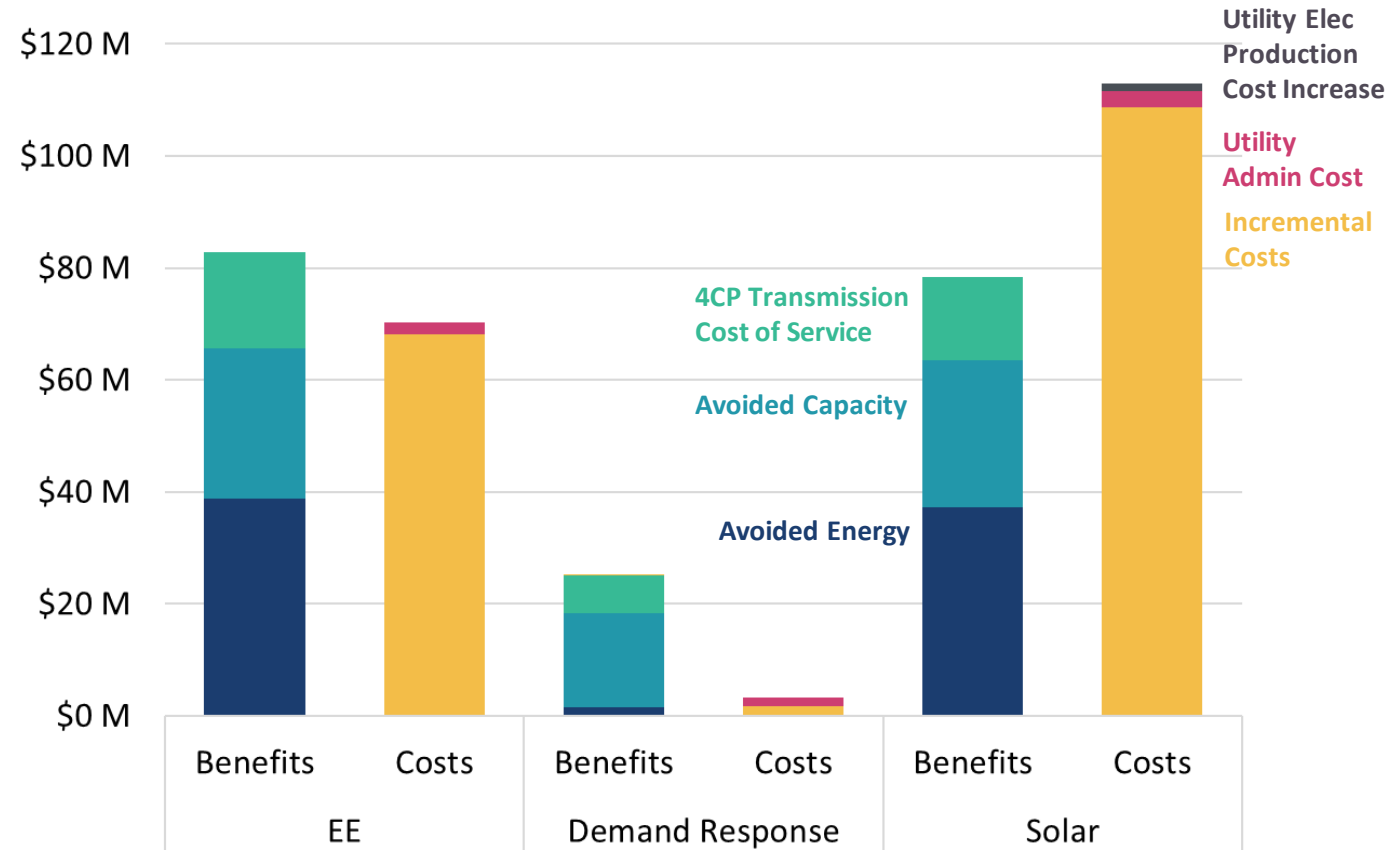
STEP Program According to the TRC Test (cont'd)

STEP benefits exceed the costs for EE and DR programs but not the Solar program, based on the TRC Test

- **Benefits:** EE again produces the largest avoided energy, avoided capacity, and 4CP transmission cost of service benefits
- **Costs:** Incremental Costs represent the highest portion of costs, and outweigh benefits for the Solar program

The DR program provides the highest B/C Ratio (7.6), followed by EE (1.2) and Solar (0.7)

STEP Benefits and Total Resource Costs (FY 2021)



Sources and Notes: Data provided by Frontier. Solar costs are net of the Investment Tax Credit.

The Value Provided by the STEP Program

- Based on two widely accepted cost-effectiveness tests, STEP programs were found to be cost effective
- The mismatch in the timing of STEP program expenses (incurred today) and benefits (accrue in the future) should not mask STEP's key role in keeping rates affordable for customers
- While CPS Energy and its customers pay for STEP today, it will **save more money for customers in the future**
 - Avoided Capacity Savings: The STEP program will lead to further reductions peak load so CPS Energy does not have to build additional power plants, allowing CPS Energy's rates to remain affordable for all customers
 - Avoided Transmission Cost Savings: by reducing 4CP, it reduces CPS Energy's transmission cost obligations
 - Avoided Energy Costs: help reduce total energy consumption, lead to customer bill savings and increase satisfaction
 - STEP program improves CPS Energy's system flexibility which is needed due to increasing share of renewable generation
 - STEP helps with the reliability and resilience of the CPS Energy system during extreme weather events (i.e. several studies found that more efficient building envelopes and heating systems would have dropped the peaks sufficient enough to offset the load from failed generators during Winter Storm Uri)
- Provided that CPS Energy properly manages the costs associated with the STEP program, these customer-facing programs help keep rate increases under check and reduce the likelihood of the market being opened up to competition in the future

Sources and Notes: "[Evaluation, Measurement & Verification of CPS Energy's FY 2019 DSM Programs](#)", Frontier Energy, 2019.

Recap

1- In 2019, the average residential CPS Energy residential customer paid \$57 for STEP or about 4% of their annual electricity and gas bill

2- STEP portfolio is cost effective based on the PAC test, meaning that the benefits to the system are higher than the expenses incurred by CPS Energy and its customers to support these programs

- Individual programs in the STEP portfolio, EE, DR and Solar, also pass the PAC test
- STEP program avoids future capacity costs, which implies lower rates for all customers compared to a “but-for” case
- It is also important to make the grid as efficient as possible before electrification increases the load requirements and drives the demand on certain parts of the grid

3- STEP portfolio also passes the TRC test; however solar program reduces the portfolio cost effectiveness when viewed from a total resource cost perspective

- Solar program may need to be redesigned to create more value for the system (i.e. rebates for systems paired with storage which can be controlled by CPS Energy)

Board Member Question Tracker

| Focus Area | Board Member | Question/Comment | Addressed |
|---|-----------------------|---|-----------|
| 1-STEP Overview and Significance | Former Trustee Kelley | Declare success (STEP goal was achieved; a power plant was avoided) and move on. | Yes |
| | Mayor Nirenberg | Define our next goal for STEP. What is it we are trying to achieve? | Yes |
| 2- STEP Cost Effectiveness | Trustee Steen | Breakout the cost of STEP on customer bills. Looking for additional transparency as customers can't see how much they are paying for STEP. | Yes |
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| | Trustee Gonzalez | Do an assessment of the program to include conservation, equitable investments, and safety; ii) Evaluate and have high-level criteria for the program | Yes |
| | Chair Dr. Mackey | Do a lessons learned and ROI analysis on the STEP program | Yes |
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| | Former Trustee Kelley | Do a clean sheet, deep dive analysis to determine if the STEP program still makes sense after twelve years. | |
| | Chair Dr. Mackey | Do we still need it, are we meeting the needs today? | |

3- Peer Utility Benchmarking

This section reviews a group of peer utilities' customer-side programs and benchmarks STEP to these programs

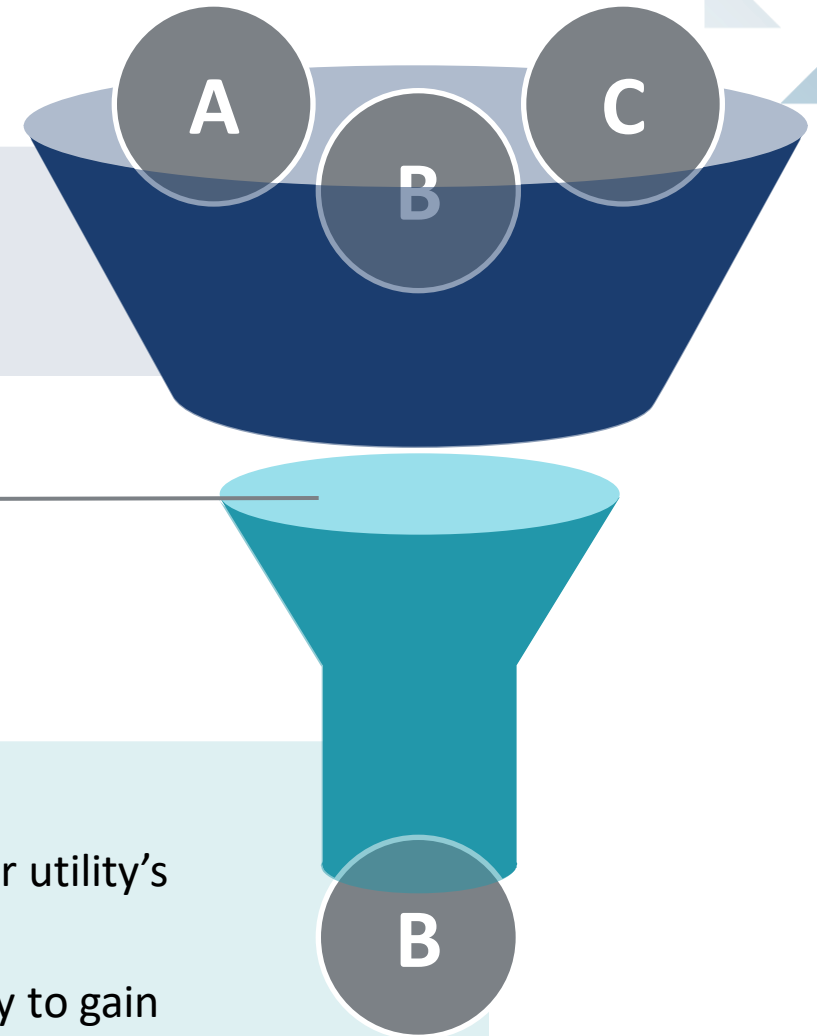
Benchmark Assessment Process

Peer Utility Research: We created a targeted list of peer utilities in consultation with the CPS Energy to examine their portfolio of customer-facing energy programs

SHORT LIST OF 15 PEER UTILITIES TO RESEARCH

Detailed Peer Utility Analysis:

- We conducted detailed analysis of publically available data on each peer utility's customer-facing energy programs
- We supplemented our research with a questionnaire to each peer utility to gain additional insights that were not available publically



Why Do Utilities Pursue Customer-facing Energy Savings Programs?

Lower customer bills over the long term

- Customers participating in utility or state-sponsored efficiency programs are saving **up to \$400 annually** on energy bills
- According to the ACEEE, the DOE Weatherization Assistance Program, which makes energy efficiency improvements to the homes of low-income families, helps families save an average of **\$4,200 in lifetime utility bills**

Lower emissions

- In 2019, the ENERGY STAR program saved customers **500 TWh of electricity**, resulting in emissions reductions of 390 million metric tons of greenhouse gas emissions (about **5%** of US total GHG emissions)

Lowering long term costs for the system as a whole

- Saving energy via customer energy efficiency programs can generally be achieved at **less than 1/3rd the cost** of supply side alternatives
- Effective customer facing energy savings programs can **avoid** the following costs
 - ▶ Capacity – Utilities with effective EE/DR programs are under fewer obligations to construct additional capacity to meet peak load
 - ▶ T&D – Utilities with effective EE/DR programs can construct fewer transmission & distribution assets while still maintaining reliability
 - ▶ Environmental Compliance – Utilities with effective energy savings programs can avoid the cost of compliance with regulations
- Effective demand response programs which smooth peaks in load can **improve the efficiency of load matching supply resources** and can prevent costly/GHG-intensive resources from needing to come online to meet customer demand

Sources: [ACEEE – Energy Efficiency as a Resource](#); [ACEEE – Everyone Benefits: Practices and Recommendations for Utility System Benefits of Energy Efficiency](#); [US DOE – Reduce Energy Bills, Protect the Environment](#); [ACEEE – The Impact of Federal Energy Efficiency Programs](#); [Energy STAR Impacts](#).

3- PEER UTILITY BENCHMARKING

What programs are being offered by CPS Energy's peer utilities?

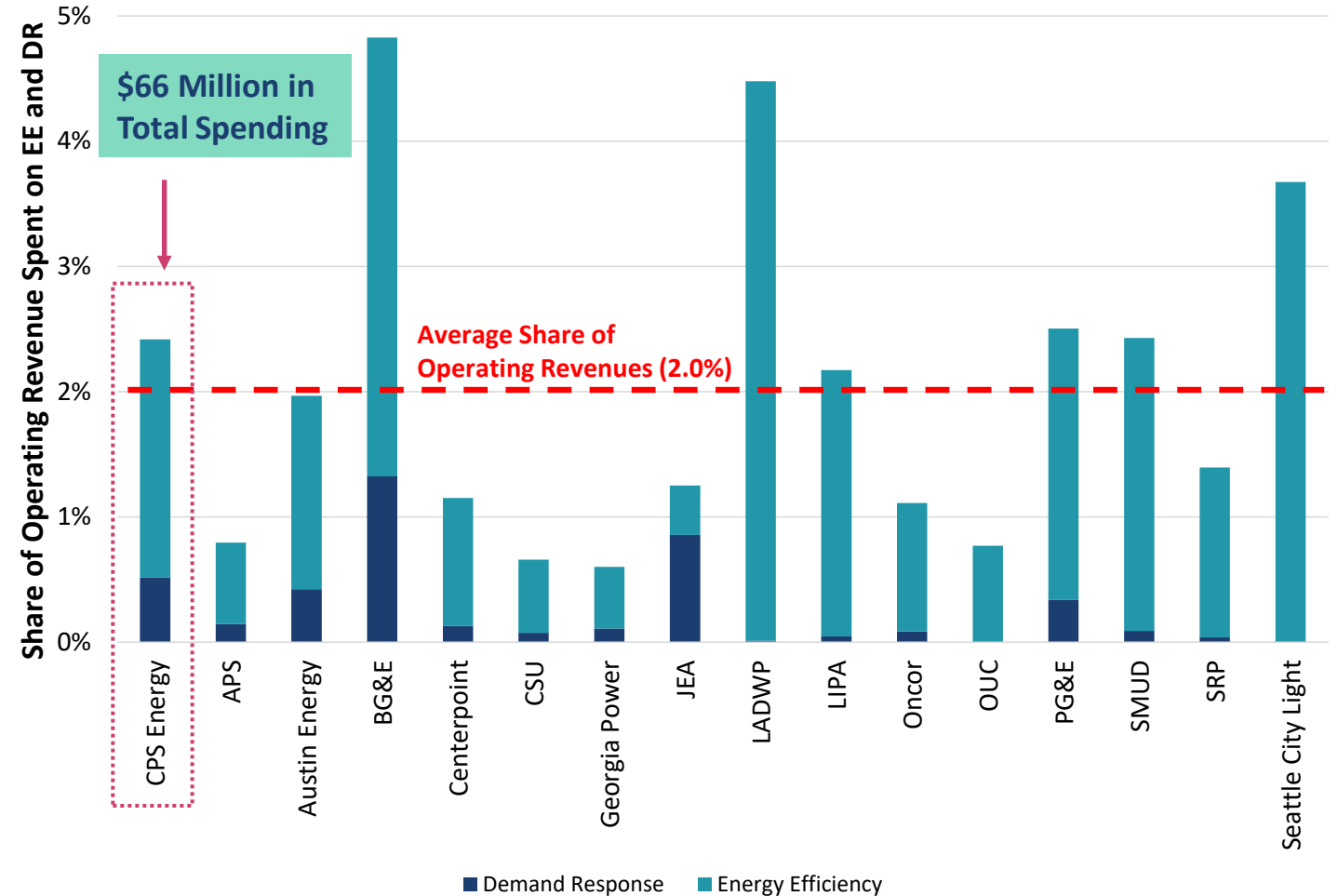
| Utility | Type | Energy Efficiency | Demand Response | Rooftop and Community Solar Incentives | Energy Efficiency Programs for LMI Customers |
|---|------------------|-------------------|-------------------|--|--|
| CPS Energy | Municipal | ✓ | ✓ | ✓ | ✓ |
| Arizona Public Service (APS) | IOU | ✓ | ✓ | - | - |
| Austin Energy | Municipal | ✓ | ✓ | ✓ | ✓ |
| Baltimore Gas & Electric (BG&E) | IOU | ✓ | ✓ | ✓ | - |
| Centerpoint Energy | IOU | ✓ | ✓ | - | ✓ |
| Colorado Springs Utilities (CSU) | Municipal | ✓ | - | ✓ | - |
| Georgia Power | IOU | ✓ | ✓ | ✓ | ✓ |
| Jacksonville Electric Authority (JEA) | Municipal | ✓ | Residential Pilot | ✓ | ✓ |
| Los Angeles Department of Water and Power (LADWP) | Municipal | ✓ | ✓ | ✓ | ✓ |
| Long Island Power Authority (LIPA) | Municipal | ✓ | ✓ | ✓ | ✓ |
| Oncor Electric Delivery | IOU | ✓ | ✓ | ✓ | ✓ |
| Orlando Utilities Commission (OUC) | Municipal | ✓ | - | ✓ | ✓ |
| Pacific Gas & Electric (PG&E) | IOU | ✓ | ✓ | ✓ | ✓ |
| Sacramento Municipal Utility District (SMUD) | Municipal | ✓ | ✓ | ✓ | - |
| Salt River Project (SRP) | Municipal | ✓ | ✓ | ✓ | ✓ |
| Seattle City Light | Municipal | ✓ | - | - | ✓ |

The share of revenue spent on EE and DR programs varies widely

In 2019, CPS Energy spent the equivalent of 2.4% of its operating revenue on EE and DR programs compared to 2% by average of its peers

- BG&E, LADWP, Seattle City Light spent more than **4%** of their operating revenue on customer facing programs in 2019
- APS, CSU, Georgia Power, and OUC spent less than **1%** of their operating revenue on customer facing programs in 2019

Share of Operating Revenue Spent on EE and DR Programs (2019)



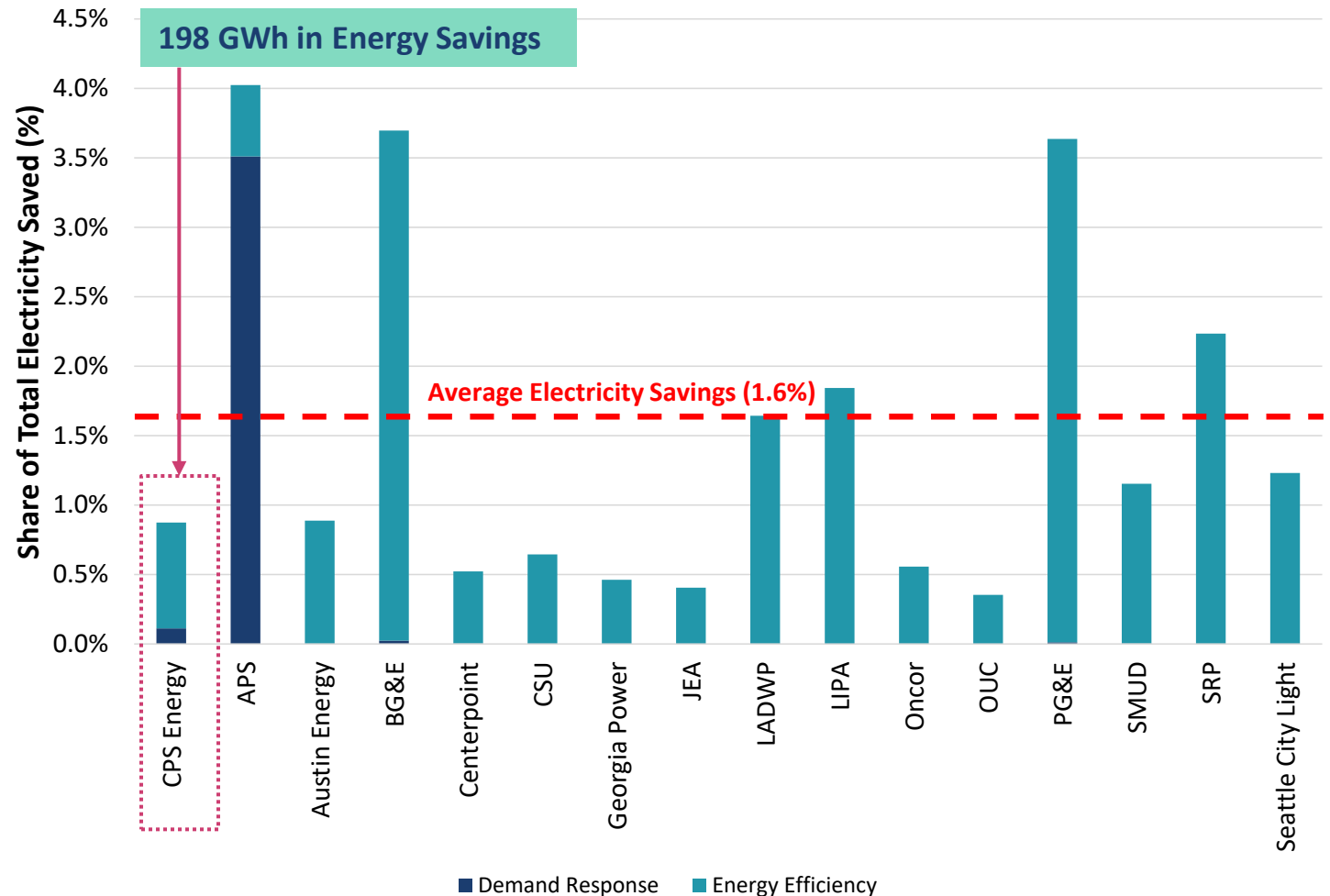
Sources and Notes: Annual Operating Revenues data was pulled from the 10-Ks for each utility. Demand Response and Energy Efficiency Program costs was pulled from the [Annual Electric Power Industry Report](#). To calculate the share of operating revenue spent on EE and DR programs for each utility, we added the combined costs of the Demand Response and Energy Efficiency Programs and divided the resulting figure by the utility's Operating Revenue in 2019.

Energy Savings from EE and DR Programs

CPS Energy’s EE and DR programs achieved a below average share of total energy savings (0.9%) relative to 1.6% average of its peer utilities

- This is not surprising as STEP was intended to be a capacity (MW) reduction program, not energy reduction (MWh)

Energy Savings from EE and DR Programs (2019)



Sources and Notes: [Energy_Efficiency_2019.xlsx](#), [Annual Electric Power Industry Report, Form EIA-861](#) data files. The share of total electricity saved is equal to the sum of electricity savings from DR programs and electricity savings from EE programs divided by the company’s total electricity sales in 2019.

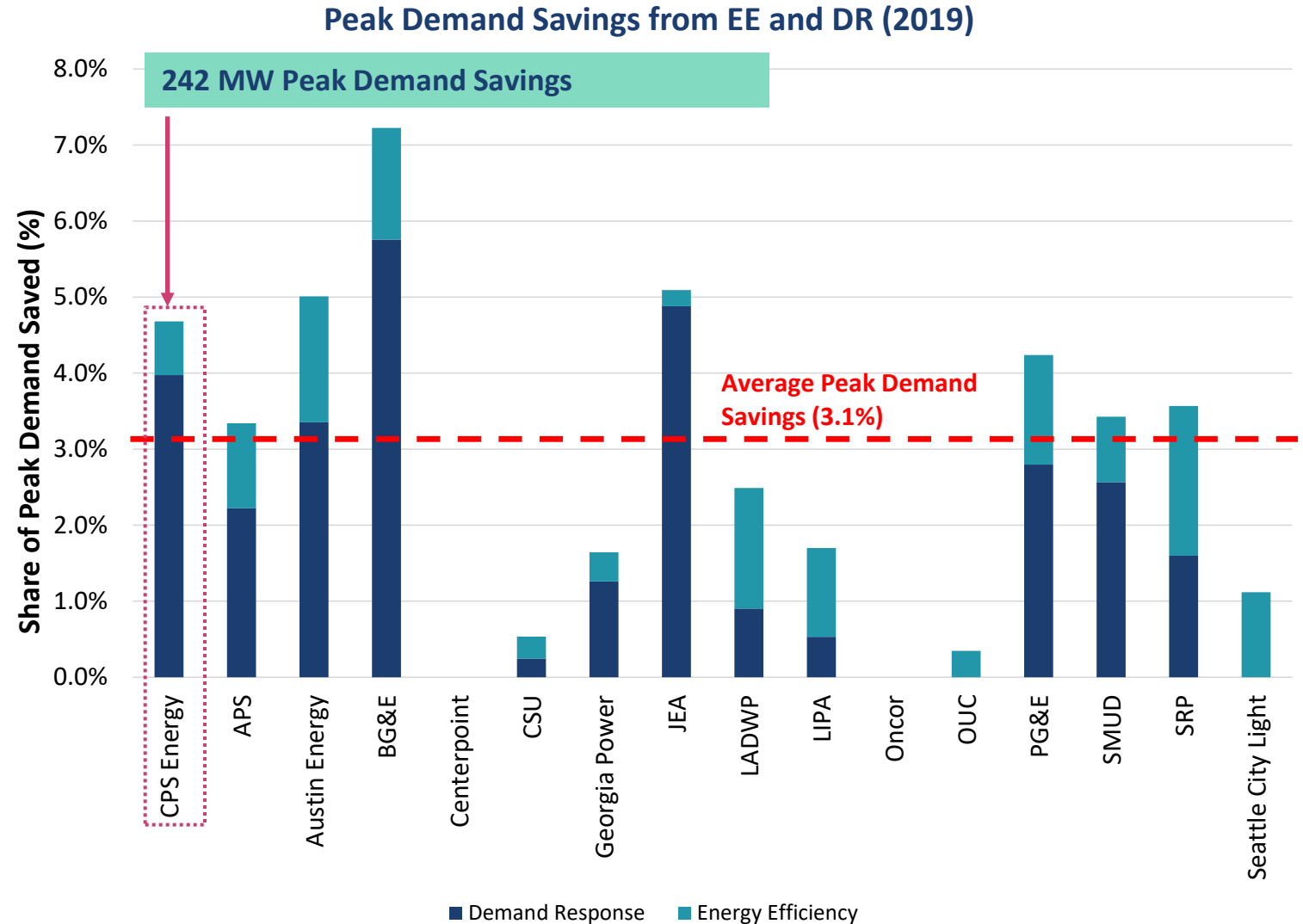
Peak Demand Savings from EE and DR Programs

CPS Energy’s EE and DR programs achieves the third highest potential peak demand savings by share (4.7%) relative 3.1% average of its peers

- Despite above average potential peak demand savings from EE and DR, Austin Energy, BG&E, and JEA have a higher share of peak demand savings
- CPS Energy’s peak demand savings are equal to actual peak demand

Sources and Notes: [Annual Electric Power Industry Report, Form EIA-861](#). EIA does not publish data on potential peak demand savings from EE, so actual EE peak demand savings are reported in the figure.

The share of peak demand saved was calculated by dividing the sum of potential peak demand savings from DR and actual peak demand savings from EE by the peak demand in 2019.



Peer utilities offer a rich portfolio of customer-facing programs

Peer Utility EE and DR Program Offerings

| | |
|--|---|
| New Construction | <ul style="list-style-type: none"> • APS provides training and rebates for developers to procure energy efficient appliances, HVAC systems, and smart thermostat |
| Heat Pumps, Water Heaters, and HVAC systems | <ul style="list-style-type: none"> • Utilities are providing between \$150 and \$4,800 rebates on heat pumps • Utilities provide rebates for window A/C which can be attractive to renters and low-income customers • Many utilities provide rebates on HVAC systems • LADWP provides \$200 for a whole house fan • Utilities provide rebates for efficient water heaters • LIPA offers rebates of up to \$2,000/ton on geothermal heating |
| Financing | <ul style="list-style-type: none"> • Austin Energy works with Velocity Credit Union provides 0% interest financing for energy efficiency improvement • LADWP and PG&E provided 100% financing with no closing costs or fees for home efficiency improvements |
| Appliance Upgrades | <ul style="list-style-type: none"> • Utilities offer rebates for washers, dryers, electric lawn equipment, and pool pumps |
| Demand Response | <ul style="list-style-type: none"> • BG&E provides \$50 to \$100 in bill credits to customers that allow cycling their air conditioning on and off • PG&E receive a credit of approximately \$0.024 per kwh for all usage, from June 1 to September 30, except for usage between 2PM and 7PM on SmartDays • Centerpoint Energy customers receive a one-time \$75 bill credit and a \$5 credit on monthly electric bills between June and September |
| Cool Roofs and Windows | <ul style="list-style-type: none"> • LADWP offers \$0.20 to \$0.30 per sq. ft. for a cool roof • Utilities offer rebates for energy star windows |
| Customer-facing Tools | <ul style="list-style-type: none"> • LIPA provides an interactive tool that allows customers to see how they can save on energy without sacrificing comfort |

Peer utilities offer a rich portfolio of customer-facing programs (cont'd)

| Peer Utility Solar / Battery / Electrification Programs | |
|---|--|
| Electric Transportation | <ul style="list-style-type: none"> • LADWP provides up to \$1,500 through the Used EV Rebate Program • PG&E provides up to \$750 towards the purchase or lease of an EV • Many utilities provide rebates to install EV chargers in their homes • Austin Energy provides \$300 rebates for customers to purchase eBikes, scooters, moped, and motorcycles |
| Battery Storage | <ul style="list-style-type: none"> • APS provides a \$2,500 incentive for sharing battery performance data and \$1,250 per home to send power to the grid • JEA, PG&E provides rebates and incentive for customers that purchase of a qualified battery storage system • LIPA has a Energy Storage Rewards program for customers that have at least 80% of their batteries available between May 1 and September 30 |
| Solar Incentives and Leases | <ul style="list-style-type: none"> • CSU, OUC, provide rebates and incentives that reduce the total cost of a solar system (OUC is for Solar PV-Battery systems) • Many utilities with solar programs offer credits for sending energy back on the grid • SMUD and LADWP provides solar leasing programs |
| Community Solar | <ul style="list-style-type: none"> • BG&E, CSU, PG&E, LADWP, Georgia Power, and LIPA have community solar programs that are open to renters and customers in multi-unit structures • LADWP's community solar program has a special rate for low-income customers |
| Solar Water Heaters | <ul style="list-style-type: none"> • JEA and OUC provides rebates on Solar Thermal Water Heaters |

Peer utilities also offer a wide range of programs targeting low income customers

| Innovative LMI Programs | |
|--|--|
| Weatherization Assistance and Free Home Energy Improvements | <ul style="list-style-type: none">• Austin Energy, APS, Colorado Springs Utilities, LADWP, Georgia Power, JEA, LIPA, Oncor, OUC, PG&E, SMUD, SRP, and Seattle City Light offers free home energy improvements (e.g. insulation, sealing, solar screens, LED lighting, energy efficient appliances, energy star window air conditioners) to LMI customers that own their homes (some programs allow for renters to participate with the landlord's permission)• BG&E and SRP provides up to \$7,500 and \$6,000 for energy efficiency improvements following a home energy audit, respectively• Centerpoint Energy pays half the cost for qualifying weatherization upgrades and high efficiency equipment replacements |
| Community Engagement | <ul style="list-style-type: none">• SMUD Provide job training, clean energy and beautification to underserved neighborhoods |
| Financing | <ul style="list-style-type: none">• Seattle City Light provides low interest loans for new HVAC systems for low-income customers |
| Community Solar | <ul style="list-style-type: none">• LADWP provides a low-income rate for low-income customers participating in their community solar program• Utilities with solar programs allows renters and low-income customers to participate |
| Transportation Electrification | <ul style="list-style-type: none">• PG&E provides up to \$2,500 per income-eligible single family household for EV charging equipment |

Recap

1- We compared CPS Energy's portfolio of customer-facing programs to those from 15 peer utilities and found that the CPS Energy compares favorably to its peers:

- Rich portfolio of programs covering EE, DR, solar and low-income program offerings
- CPS Energy allocates roughly 2.4% of its revenues to finance its EE and DR programs, slightly higher than the average of its peers (2%)

2- Peer utilities offer rich portfolios of customer-facing programs inclusive of EE, DR, solar and electrification programs

- Expand the focus on the electrification of the transportation sector
- Increasing number of intersectional programs across solar, battery, and electrification technologies (e.g., Solar Water Heating, Solar-Battery Systems, and Battery Storage with demand response)

3- Peer utilities also offer a variety of programs targeting LMI customers, above and beyond the weatherization programs

- Many energy efficiency programs offer free or heavily subsidized weatherization and appliance upgrades
- 0% interest and 100% financing for low-income customers and renters to pay for energy efficient appliances and home improvements
- Inclusive of renters and low-income customers (e.g. community solar and low-income community solar rates)

Board Member Question Tracker

| Focus Area | Board Member | Question/Comment | Addressed |
|---|-----------------------|---|-----------|
| 1- STEP Overview and Significance | Former Trustee Kelley | Declare success (STEP goal was achieved; a power plant was avoided) and move on. | Yes |
| | Mayor Nirenberg | Define our next goal for STEP. What is it we are trying to achieve? | Yes |
| 2- STEP Cost Effectiveness | Trustee Steen | Breakout the cost of STEP on customer bills. Looking for additional transparency as customers can't see how much they are paying for STEP. | Yes |
| | Mayor Nirenberg | 1) Illustrate everything in our fuel adjustment, breakout fuel cost from all sources including coal, nuclear, natural gas and renewables, 2) Put together goals, benchmarks, customer sentiment, and cost of program vs. impact of program. | Yes |
| | Trustee Gonzalez | Do an assessment of the program to include conservation, equitable investments, and safety; ii) Evaluate and have high-level criteria for the program | Yes |
| | Chair Dr. Mackey | Do a lessons learned and ROI analysis on the STEP program | Yes |
| 3- Peer Utility Benchmarking | Trustee Gonzalez | Pivot the program to be more innovative, so programs are not stale | Yes |
| 4- Recommendations for the Future of STEP | Trustee Steen | Eliminate or rescale the STEP program and use the savings to relieve financial stress from Winter Storm Uri | |
| | Former Trustee Kelley | Do a clean sheet, deep dive analysis to determine if the STEP program still makes sense after twelve years. | |
| | Chair Dr. Mackey | Do we still need it, are we meeting the needs today? | |

4- Recommendations for STEP

Having reviewed the performance of the STEP program in terms of its energy and capacity savings; cost-effectiveness and comparison to similar programs administered by CPS Energy's peer utilities, this section provides recommendations for the evolution of STEP

Brattle Recommendations for STEP

1- Maintain the momentum of the STEP program as the realities of the new grid will require more flexibility

- Customer-facing programs cannot be built overnight when needed; CPS Energy built a successful portfolio over the past decade which delivered in its core mission
- STEP can evolve and expand in the areas CPS Energy system requirements indicate
- Assess the STEP program performance at the end of each planning cycle, and refresh the portfolio in a way to meet the impending system needs (e.g. winter peak reduction or carbon reduction)
- Each of CPS Energy's peer utilities have sizable customer program portfolios with rich and diverse programs addressing EE, DR and emerging technologies

2- CPS Energy may want to reevaluate the solar program and whether it meets its program objectives

- Shift spending towards community solar projects where renters and LMI customers are more likely to participate
- Shift rebate and incentive spending towards more cost effective programs from a total system perspective, such as solar+ BTM storage, where the storage system can be controlled by CPS Energy for system emergencies

3- Improve STEP program awareness and cost-saving benefits of the STEP program and perform more community engagement

- Despite a lack of community awareness, CPS Energy has met its capacity savings goals and can achieve more in the future
- Increased efficiency and demand response are likely to become more important as CPS Energy retires its coal fleet

Brattle Recommendations for STEP (cont'd)

4- Expand the scope of the LMI programs in the STEP portfolio to include financing for efficient appliances and community solar with LMI-specific rates

5- Continue to explore low-cost initiatives to achieve energy savings

- Invest in low-cost behavioral energy efficiency initiatives (e.g. customer-facing web/phone apps and targeted messages) to better educate customers on EE programs and to promote behavioral changes in support of energy conservation
- Explore implementing time-of-use (TOU) rates to shift peak demand for customers

4- STEP RECOMMENDATIONS

Board Member Question Tracker

| Focus Area | Board Member | Question/Comment | Addressed |
|--|-----------------------|---|-----------|
| 1- STEP Overview and Significance | Former Trustee Kelley | Declare success (STEP goal was achieved; a power plant was avoided) and move on. | Yes |
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| | Former Trustee Kelley | Do a clean sheet, deep dive analysis to determine if the STEP program still makes sense after twelve years. | Yes |
| | Chair Dr. Mackey | Do we still need it, are we meeting the needs today? | Yes |

Appendix

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The views expressed in this presentation are strictly those of the presenter(s) and do not necessarily state or reflect the views of The Brattle Group or its clients.

Calculations for Slide 4

STEP Program Impact Calculations

| | | FY 9 | FY 10 | FY 11 | FY 12 | FY 13 | FY 14 | FY 15 | FY 16 | FY 17 | FY 18 | FY 19 | FY 20 | FY 21 | Sum | Average |
|--------------------------------------|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| Cumulative Demand Reduction (NCP MW) | [1] | 40 | 162 | 221 | 273 | 318 | 345 | 352 | 463 | 522 | 620 | 714 | 845 | 926 | NA | NA |
| Demand Reduction (NCP MW) | [2] | 40 | 122 | 59 | 52 | 45 | 27 | 7 | 111 | 59 | 98 | 94 | 131 | 81 | 926 | 71 |
| Net Energy Savings (GWh) | [3] | 75 | 90 | 60 | 74 | 112 | 98 | 127 | 122 | 242 | 243 | 219 | 263 | 245 | 1,969 | 151 |
| San Antonio Energy Sales (GWh) | [4] | 20,003 | 20,430 | 20,633 | 22,019 | 21,374 | 21,478 | 21,819 | 21,882 | 22,188 | 22,415 | 22,829 | 22,997 | 22,558 | 282,625 | 21,740 |

Sources and notes:

[1] : CPS Energy, "Evaluation, measurement, and Verification of CPS Energy's FY 2021 DSM Portfolio," May 20, 2021

[2]: [1], Current FY – [1], Previous FY

[3]: CPS Energy, "Evaluation, Measurement, and Verification of CPS Energy's FY 2020 DSM Programs," June 24, 2020; ICF, CPS Energy; CPS Energy, "Evaluation, measurement, and Verification of CPS Energy's FY 2021 DSM Portfolio," May 20, 2021 "Save for Tomorrow Energy Plan ("STEP") Program Review", November 2019.

[4]: CPS Energy Data

Red boxes signify numbers referenced in slide 4

Additional calculations:

[A]: Net Energy Savings FY 09 – FY 21; Sum[3] = 1,969 GWh; Average[3] = 151 GWh

[B]: San Antonio Energy Sales FY 09 – FY 21; Sum[4] = 282,625 GWh; Average[4] = 21,740 GWh

[C]: STEP Net Average Energy Savings as a % of San Antonio Average Energy Sales; [A] Average / [B] Average = 151 GWh / 21,740 GWh = 0.7%

Avoided Capacity Costs (assuming a 926 MW Industrial Frame Combustion Turbine at \$709,000/MW ([EIA Cost and Performance Characteristics of New Generating Technologies, AEO 2021](#)): \$709,000/MW x 926 MW = \$656,534

Analysis of CPS Energy's STEP Program According to the RIM Test

- According to the RIM Test, CPS Energy's FY2021 STEP portfolio provided about **\$187 M** in benefits and cost **\$287 M**
- Only CPS Energy's demand response program yielded more benefits than costs
- The BCR of the Commercial EE and Weatherization programs was lower than **0.5**
- The total cost of CPS Energy's solar program was **\$46 M** more than the total benefits it provided

STEP Program Cost-Effectiveness (2021)

| Program | RIM Test | | |
|-------------------------|----------------|----------------|-----------------|
| | Benefits | Costs | BCR |
| | (\$ M) | (\$ M) | |
| [1] | [2] | [3] | [4] = [2] / [3] |
| Energy Efficiency | \$82.8 | \$150.1 | 0.55 |
| Residential EE | \$31.1 | \$45.1 | 0.69 |
| Commercial EE | \$45.4 | \$91.8 | 0.49 |
| Weatherization | \$6.3 | \$13.2 | 0.48 |
| Demand Response | \$25.3 | \$11.3 | 2.23 |
| Solar Energy | \$78.4 | \$125.0 | 0.63 |
| BCR, No Solar | \$108.1 | \$161.4 | 0.67 |
| BCR, Incl. Solar | \$186.5 | \$286.5 | 0.65 |

Notes: Data provided by Frontier. Solar costs are net of the Investment Tax Credit.

Analysis of CPS Energy's STEP Program According to the PCT Test

- According to the PCT Test, CPS Energy's FY2021 STEP portfolio provided about **\$285 M** in benefits and cost **\$181 M**
- CPS Energy's commercial energy efficiency program provided **\$46 M** more in benefits than costs
- **60%** of the cost of CPS Energy's STEP portfolio came from the Solar Energy program

STEP Program Cost-Effectiveness (2021)

| Program | PCT Test | | |
|-------------------------|--------------------|-----------------|-----------------|
| | Benefits (\$ M) | Costs (\$ M) | BCR |
| [1] | [2] | [3] | [4] = [2] / [3] |
| Energy Efficiency | \$154.3 | \$71.9 | 2.15 |
| Residential EE | \$47.3 | \$17.2 | 2.74 |
| Commercial EE | \$94.9 | \$48.4 | 1.96 |
| Weatherization | \$12.1 | \$6.3 | 1.93 |
| Demand Response | \$9.7 | - | - |
| Solar Energy | \$120.9 | \$108.7 | 1.11 |
| BCR, No Solar | \$164.0 | \$71.9 | 2.28 |
| BCR, Incl. Solar | \$284.8 | \$180.5 | 1.58 |

Notes: Data provided by Frontier. Solar costs are net of the Investment Tax Credit.