EXH. BDJ-1Tr
DOCKETS UE-240004/UG-240005
2024 PSE GENERAL RATE CASE
WITNESS: BIRUD D. JHAVERI

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**Docket UE-240004** **Docket UG-240005**

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF

BIRUD D. JHAVERI

ON BEHALF OF PUGET SOUND ENERGY

REVISED
MARCH 4, 2024

FEBRUARY 15, 2024

PUGET SOUND ENERGY

PREFILED DIRECT TESTIMONY (NONCONFIDENTIAL) OF BIRUD D. JHAVERI

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I. INTRODUCTION

Q. Please state your name, business address, and position with Puget Sound Energy.

A. My name is Birud D. Jhaveri, and my business address is 355 110th Avenue NE, Bellevue, Washington 98004. I serve as the Director of Regulatory Affairs for Puget Sound Energy ("PSE" or the "Company").

Q. Have you prepared an exhibit describing your education, relevant employment experience, and other professional qualifications?

A. Yes, I have. It is Exh. BDJ-2.

Q. What are your duties as Director of Regulatory Affairs for PSE?

A. I am responsible for cost of service, tariffs, and overall regulatory affairs at PSE.

Q. What topics are you covering in your testimony?

A. In my testimony, I address PSE's time varying rate ("TVR") pilot and PSE's proposal for offering TVR to its electric residential customers. I provide an update on PSE's Energy Burden Study, including an evaluation of moderate-income customers' energy burden, and related issues. I also discuss equity considerations related to PSE's rates.

Q. How are you considering equity in your testimony?

A. Incorporating energy equity is key to PSE successfully serving all customers, particularly keeping energy bills affordable for customers who are low-income and energy-burdened during this clean energy transformation. To achieve this, PSE is applying the four energy justice tenets—through (i) regulatory policies, orders, and tariffs (restorative justice), (ii) identification of priority populations, such as energy-burdened and low-income customers (recognition justice), (iii) engagement with advisory groups and the community seeking feedback (procedural justice), and (iv) improving program designs, customer journeys, and participation to reduce customers' energy bills and provide other benefits and services (distributional justice).

For more information on PSE's strategy and approach on incorporating energy equity across the Company and the four energy justice tenets, please refer to the Prefiled Direct Testimony of Troy A. Hutson, Exh. TAH-1T. Additionally, for more information about PSE's energy assistance programs, please refer to the Prefiled Direct Testimony of Carol L. Wallace, Exh. CLW-1T.

II. PSE'S TIME VARYING RATE PILOT

Q. Please summarize this section of your testimony.

A. In this section, I describe PSE's implementation of its TVR pilot program. Final Order 24/10 in the 2022 general rate case required PSE to establish a TVR pilot program, including new optional time of use ("TOU") rate schedules. PSE began

with residential service under the pilot on October 1, 2023, and began general service beginning January 1, 2024.[1] The TVR pilot, and TOU rates in general, are designed to lower peak demand and lower system costs by providing pricing signals via base energy rates that encourage customers to reduce usage during periods of peak demand. The TVR-related tariffs are as follows**:**

- Schedule 307 – This schedule provides for a residential electric service that offers predictable time-of-use rates, applying set pricing tiers for electric service depending on when a customer is using it throughout the day. The time-of-use rates under this schedule are broken into peak and off-peak times.

- Schedule 317 – This schedule provides for a residential electric service that offers both predictable time-of-use rates and the opportunity for customers taking service under this schedule to receive a rebate for reducing energy use during PSE-called events, relative to each customer's baseline energy use, as determined by PSE.

- Schedule 327 – This schedule provides for a residential electric service that offers predictable whole-home time-of-use rates for electric vehicle charging, applying set pricing tiers for electric service depending on when a customer is using it throughout the day. The time-of-use rates under this schedule are broken into peak, off-peak, and super off-peak times.

- Schedule 324 – This schedule provides for non-residential general service electric service that offers both predictable time-of-use rates and the opportunity for customers taking service under this schedule to receive a rebate for reducing energy use during PSE-called events, relative to each customer's baseline energy use, as determined by PSE.

Q. Has PSE been able to implement the TVR pilot in alignment with the originally proposed schedule?

A. Yes, recruitment of residential customers began in August 2023 with customers beginning service on the TOU rate schedules in October. General service

[1] *WUTC v. PSE*, Dockets UE-220066, UG-220067 & UG-210918, Order 24/10 at ¶¶ 291-97.

customer recruitment began in December 2023, with service starting January 2024. With both classes recruiting and onboarding customers, PSE is confident it will be able to meet its goal of collecting data from the majority of two heating seasons for the pilot evaluation, measurement, and verification ("EM&V"). This should allow for the final EM&V report to be released on schedule in early 2026.

Q. Has the pilot been implemented substantially the same as presented in PSE's original proposal?

A. Yes. PSE has been able to implement and deploy the TVR pilot substantially the same as proposed; however, there have been a few modifications mostly resulting from the settlement agreement in the 2022 General Rate Case,[2] as follows:

- Provide enabling technology to half of the low-income program participants at no cost to the low-income participants, funded through Schedule 120, and examine the results in the EM&V plan.
- Provide bill protection to half of the low-income program participants and examine the results in the EM&V plan.

Q. Have the settlement modifications impacted the goals of the TVR pilot?

A. The pilot's overall goals remain unchanged: to conduct an empirically sound study of how time-varying rates might achieve the following objectives:

- lower system costs by influencing customer usage patterns;
- increase customer choice by offering more rate options;
- enhance equity and accessibility by providing customers the means to control their energy costs through alternative rate designs; and

[2] *See id.* at App. A (the "Settlement").

- expand renewable generation integration by providing demand-side pricing tools.

The respective settlement modifications further encourage data collection on bill protection and enabling technology for half of the low-income population in the treatment groups to be reported in the EM&V process.

Q. What customer treatment groups were ultimately established for the TVR pilot?

A. The pilot aims to test six treatments and enroll a minimum target of 7,500 customers, with a maximum cap of 15,000. The treatments are listed in Table 1 below. The settlement resulted in modifications that necessitated the addition of "low-income sub-treatments" for TVR pilot customers. Given that the TVR pilot was designed in parallel with, but independent from the bill discount rate ("BDR"), the TVR pilot was designed to populate the low-income treatment groups with BDR customers.

Table 1. TVR Pilot Treatments

Treatments
Residential Service Time-of-Use
Residential Service Time-of-Use (Low Income) • Enabling Technology (Smart Meter) • Bill Protection
Residential Service Time-of-Use with Peak Time Rebate
Residential Service Time-of-Use with Peak Time Rebate (Low Income) • Enabling Technology (Smart Meter) • Bill Protection
General Service Time-of-Use with Peak Time Rebate
Residential Service Time-of-Use with Super Off-Peak

Q. How many customers did PSE solicit to participate during pilot recruitment?

A. PSE targeted a minimum of three percent opt-in rate, by pre-selecting 175,000 residential electric customers at random. Recruitment involved five waves targeting 25,000-50,000 customers per wave using personalized estimates of bill impacts between a default rate and a TOU rate, resulting in an average opt-in rate of roughly four percent. For the general service recruitment, PSE pre-selected 40,000 small business electric customers, and recruitment was conducted in two waves of 20,000 customers using personalized estimates of bill impacts.

Q. How was PSE able to present customers with personalized recruitment materials?

A. PSE utilized customers' advanced metering infrastructure interval meter data from the previous year to model customers' hypothetical bill impacts of participating in the TVR pilot. Customers were further able to tailor the analysis to account for behavior changes that could move energy consumption outside of peak hours and allow them to see what their potential savings could be between the bill impact comparisons.

Q. How else will customers' advanced metering infrastructure data be used in the TVR pilot?

A. TVR represents PSE's pivot to utilizing advanced metering infrastructure interval data for customer billing on next generation rate designs. The pilot utilizes hourly interval data for its EM&V analysis in order to inform TVR pilot efficacy and

tailor full scale rates in the future. Please see the Prefiled Direct Testimony of Roque B. Bamba, Exh. RBB-1T, for more information on PSE's advanced metering infrastructure benefit use cases.

Q. Has PSE achieved the minimum pilot treatment targets necessary for statistically valid results in the EM&V?

A. The residential schedules enrollment has reached over 8,500 residential customers; of this total, over 8,000 were recruited as part of the pilot recruitment efforts, which surpasses the 5,500 overall residential target. This substantial residential participation level should allow for a robust EM&V process for the pilot to achieve statistically valid results. General service recruitment began December 7, 2023, with service beginning January 1, 2024. Open enrollment will continue in the coming months, but has reached approximately 1,100 of a minimum target of 2,000 customers.

Q. How has PSE designed the pilot to incorporate low-income considerations?

A. PSE's EM&V consultant will estimate TVR pilot impacts for different customer segments based on known attributes. Income eligible (80 percent AMI or 200 percent federal poverty level) customers will be verified via BDR participation and customer insights' energy burden analysis data. EM&V will also evaluate additional low-income sub-treatments and their impacts on participant behaviors.

Q. What challenges did PSE encounter in order to reach low-income treatment population targets?

A. The TVR pilot was designed to populate the low-income treatments with designated BDR customers, with the rationale being this would be the differentiator for PSE to know who was eligible to be studied in the low-income treatments with the requisite randomized sampling for recruitment. This dependence however resulted in two complications, the first of which was the deployment timing for both programs. Because TVR and BDR deployed simultaneously, the TVR team had to recruit without a pre-existing defined low-income population. The second complicating factor in reaching the low-income treatment population targets is the distinct enrollment processes between the two programs, requiring customers targeted for and enrolled in TVR to then enroll in BDR.

Q. Is PSE taking measures to increase confidence of EM&V results for low-income treatment groups?

A. In order to compensate for TVR's concurrent launch with BDR, the TVR team leveraged existing data (customer insights' energy burden analysis data), used in the creation of BDR, to segment and oversample low-income recruitment population in order to reduce potential gaps in enrollment. PSE is also continuing targeted and full TOU population marketing in coordination with BDR and other teams to encourage participation in BDR and thereby conversion into the respective treatment groups. Finally, this risk may be further alleviated by the fact

that the EM&V can potentially re-treat a customer as low-income in the analysis if a customer were to later participate in BDR.

Q. What analysis and reporting will be included in the TVR EM&V plan?

A. The EM&V plan will:

- track and analyze pilot enrollments;
- evaluate customer motivations, engagement, satisfaction, and behavior changes;
- estimate electricity demand, energy, and bill impacts of TVR treatments; and
- document pilot design, implementation, and lessons learned.

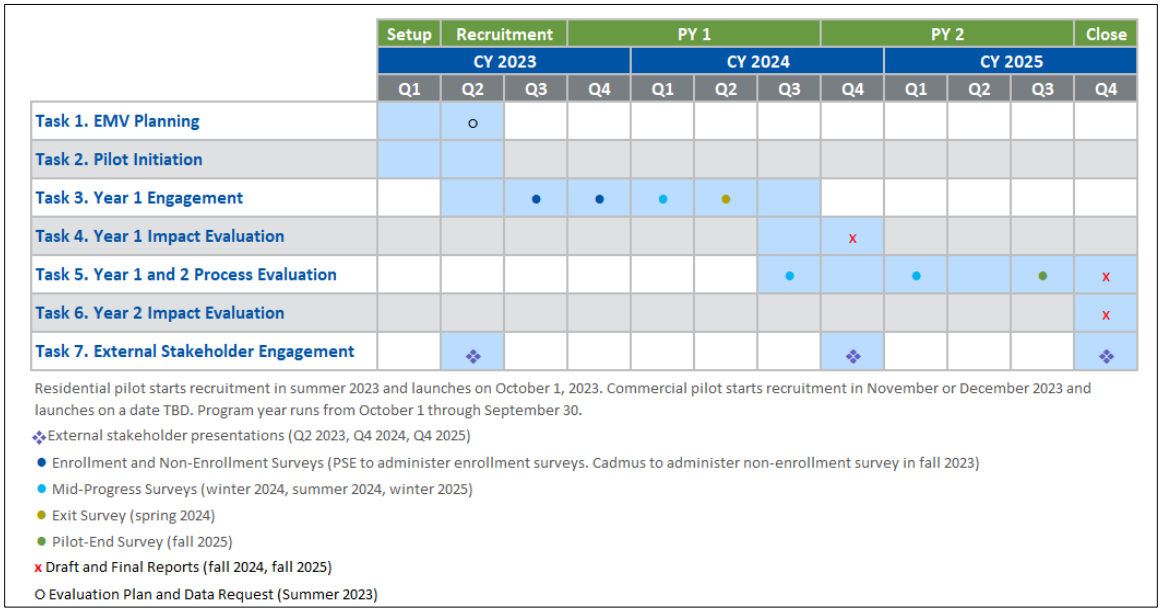
Table 2 shows the primary activities and milestones for the EM&V plan and Figure 1 provides the overall schedule for the TVR pilot and EM&V plan.

Table 2. Primary EM&V Activities and Milestones

Task #	Task Name	Task Detail	Timing
1	EM&V Planning	• Develop pilot research plan.	Q2-Q3 2023
2	Pilot Initiation	• Customer enrollment, non-enrollment, mid-progress, and exit survey instruments. • Customer feedback questionnaire and protocol for data collection.	Q3-Q4 2023
3	Year 1 Engagement	• Document results of tests and customer feedback received to date.	Q2 2023 to Q3 2024
4	Year 1 Impact Evaluation	• Year 1 Impact report provided. • Identification of opportunities for adjustment to achieve program goals.	Q4 2024 to Q1 2025
5	Process Evaluation	• Program evaluation report documenting program activities, achievements, and customer experience. • Recommendations for future TVR programs.	Q4 2025 to Q1 2026

6	Year 2 Impact Evaluation	• Year 2 Program impact evaluation report. • Opportunities /Adjustments to achieve future program goals. • Final evaluation findings.	Q4 2025 to Q1 2026

Figure 1. TVR Pilot EM&V Timeline



Q. What type of qualitative information will be solicited from customers for the EM&V regarding customer journey, understanding, and perception?

A. Customers will be surveyed throughout the pilot and these findings will be a critical way for PSE to diagnose best practices and areas of the customer experience that need improvement. Table 3 details the survey dimensions to be incorporated in EM&V reports.

Table 3. TVR Pilot Customer Survey Design

Survey	Question Topics	
Enrollment Survey	• How customers heard about the offering • Reasons for enrolling • Feedback on Rate Advisor tool • Awareness of TOU rates • Energy usage behaviors, expectations, and concerns • Residence dwelling type	• Renter or owner • HVAC equipment • Smart thermostat ownership and eligibility to receive smart thermostat • EV ownership and charger type • Concern for climate change
Non-Enrollment Survey	• Awareness of the offering • Reasons for not enrolling • Awareness of TOU rates • Energy usage behaviors • Residence dwelling type • Renter or owner	• HVAC equipment • Smart thermostat ownership and eligibility to receive smart thermostat • EV ownership and charger type • Concern for climate change
Exit Survey	• Confirmation that the customer is electing to be removed from the program • Motivations for enrolling • Reasons for unenrolling from the program • Program expectations and awareness • Self-reported level of participation and effort • Ease/difficulty of participation	• HVAC equipment • Customer-suggested improvements • Likelihood to re-enroll in the future if improvements are made • Program experience's impact on customer opinion of utility
Mid-Progress Surveys	• Recall and recognition of TOU rates and/or event communications • Usefulness of TOU rate communications including information in monthly bills and/or event communications (timing, channel, and content) • TOU rate and PTR event energy-shifting behaviors	• Reasons for participating in energy-shifting behaviors • Satisfaction with PSE, TOU rates, and PTR rebates • Perceived TOU rate bill impacts
Pilot-End Survey		

Q. Given that the TVR pilot data evaluation period is anticipated to run through fall 2025, what data might be available to PSE and interested parties in order to facilitate informed discussions on additional rate designs?

A. PSE intends to share relevant survey findings and TVR pilot impacts by customer segments as it is available over the life of the pilot; however, the primary conduits to share quantitative pilot results will be the EM&V interim and final impact reports. The objective of the year 1 impact evaluation is to demonstrate the

participant demand, energy, and billing impacts of the TVR pilot treatments during the pilot first year. This would include:

- Demand impacts: the reduction in demand during the TOU rate on peak period or shift in load from TOU rate on-peak period to off-peak period or super-off peak period (Sch. 327 only). Also, the demand impacts before, during, and after peak-time rebate ("PTR") events.

- Energy impacts: the change in overall energy consumption from enrollment in a TOU rate or a TOU rate with PTR.

- Billing impacts: the impacts of enrollment in a TOU rate or TOU rate with PTR on the customer's bill.

The year 2 impact evaluation will repeat this analysis and will compare the year 1 to year 2 energy and demand impact results to identify changes in TOU rate and PTR energy, demand, and bill impacts.

Q. What key issues has PSE identified that must be thoughtfully and more robustly available in future TVR offerings?

A. The following are key issues PSE has identified:

- The need for intuitive educational materials for customers both during enrollment and throughout their participation in TVR. To this end, PSE built customizable analytics for the TOU experience, but recognizes a future need to better isolate and explain what is changing for customers due to TVR versus that of class-wide rate structures and changes.

- As PSE pivots to a more robust clean-energy future, PSE is better appreciating the multitude of intersecting customer journeys, be it electrification on the part of the customer or participating in multiple voluntary rates and programs; as it is not always immediately intuitive how certain combinations are complimentary and others are fundamentally mutually exclusive.

- TVR deployment has also highlighted how time-differentiated pricing will drive the need for more scalable IT solutions, from bill impacts,

billed/unbilled process updates, and adjustments to the decoupling calculation process.

Q. Please provide PSE's proposal for expanding the residential TVR pilot to a full-scale program.

A. PSE proposes to incorporate the data driven findings from the EM&V reporting process to inform two full-scale voluntary opt-in residential TVR programs – (1) two-tier TVR rate structure, and (2) whole-home electric vehicle-focused TVR rate structure. Completion of the EM&V for the pilot will help identify the most effective and actionable adjustments to rate designs that are appropriate for customers' energy needs. PSE anticipates that the EM&V-informed and adjusted TVR rate designs will have refined peak to off-peak ratios appropriate for our winter peaking residential class. PSE seeks to deploy rate structures materially similar to what is being tested in the TVR pilot, but improved by incorporating the lessons learned in the pilot and discussed in the EM&V report. A simple, easily understood and more broadly relevant TOU rate structure with two pricing-tiers (such as a calibrated Schedule 307) will allow for a non-technology specific base energy rate offering. Such a rate could potentially pair with other demand response and enabling technology offerings PSE will continue iterating to help meet our clean energy goals. To this end, PSE intends to compare the efficacy and value to customers of a two-tier TOU rate (like Schedule 307) with a TOU+PTR (like Schedule 314) versus combining a two-tier TOU rate with programs and offerings not directly tied to base energy, such as "flex" conservation events. Additionally, given the relevance of rate design to enable transportation

electrification, PSE also proposes to offer the whole-home electric vehicle focused TOU rate with a super off-peak (such as a calibrated Sch. 327) to residential customers.

Q. When does PSE propose to launch the new TVR rate designs?

A. PSE expects to file the comprehensive proposal inclusive of the final program and rate designs, tariff sheets and rates for the aforementioned TVR rate structures concurrently with the Company's submission of the final EM&V report in a separate filing to the Commission in early 2026.

Q. Would full TVR programs for residential or other customer classes need to be included in the decoupling calculation?

A. Yes. Any future full scale TVR programs would need to maintain the respective intra-class benefit of a respective default base energy schedule. This maintains the prevailing rationale for the application of decoupling in default base energy rates, given that any future TVR programs will continue to be designed to maintain intra-class revenue neutrality. Decoupling future TVR rates allows for a more seamless and equitable application of any customer benefits or costs accrued as they migrate between default or voluntary base schedules.

Q. Does PSE intend to offer TVR programs for customer classes not included in the current TVR pilot?

A. PSE is evaluating potential benefits for other customer classes, including transportation electrification customers. As discussed in the Prefiled Direct

Testimony of Aaron A. August, Exh. AAA-1T, PSE will continue to collaborate with customers and interested parties in order to explore rate demonstrations relevant to customers' clean energy needs. PSE is currently in early exploration stage for demonstrating electric vehicle fleet rate design with large fleet customers, likely to launch in 2025.

III. PSE'S ENERGY BURDEN ANALYSIS

A. Executive Summary

Q. Please summarize this section of your testimony.

A. This section of my testimony provides an overview of the 2022 Energy Burden Analysis ("EBA"). This is an update and extension of the 2020 Energy Burden Analysis that PSE undertook pursuant to RCW 19.405.120, which was explained and provided in my 2022 general rate case testimony.[3]

The EBA allows PSE to estimate the number of PSE's low-income customers, their respective energy burdens, and energy assistance need. The EBA has also served to analyze and better understand some of the shared characteristics of the higher energy-burdened customers. This allows PSE to design and target products and energy assistance to better address the needs of its customers that are most in need of energy assistance.

[3] *See* Docket UG-220066-67, the Tenth Exhibit to the Prefiled Direct Testimony of Birud D. Jhaveri, Exh. BDJ-11, filed on January 31, 2022.

Based on 2022 analysis data,[4] PSE's EBA shows that 46 percent of PSE's residential customers meet the low-income criterion of 80 percent area median income ("AMI"),[5] and are therefore eligible for multiple low-income energy assistance programs.[6] Additionally, the EBA shows that 16.2 percent of PSE's residential customers are currently estimated to be energy-burdened, meaning that the proportion of their annual income spent on energy costs (electricity, natural gas, and other heating fuels such as propane, heating oil, wood, and other) is over six percent.[7] About 98 percent of these energy-burdened households are estimated to be low-income. Based on the EBA study data, the percentage of PSE's 2022 customer base that is estimated to be low-income and energy-burdened is approximately 15.8 percent. Of that 15.8 percent, 60 percent are PSE's electric only customers, 21 percent are PSE's gas only customers, and 19 percent are PSE's combined electric and gas customers.

PSE also evaluated energy burden of moderate-income customers, defined as households with income between 80 percent and 115 percent AMI.[8] PSE's 2022 EBA includes about 250,000 moderate-income customers (22 percent of total

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[4] The EBA study population amounts to roughly 80 percent of PSE's total residential population based on PSE's 2022 Form 10-K; *see* Exh. BDJ-3 at 14.

[5] RCW 19.405.020(25).

[6] Exh. BDJ-3 at 25.

[7] RCW 19.405.020(17); *see also* Washington Department of Commerce, *Guidelines for RCW 19.405.120*, Version 03.09.202, available at https://www.commerce.wa.gov/wp-content/uploads/2020/03/Guidelines-for-19.405.120.pdf.

[8] RCW 84.14.010(19).

study population), out of which about one percent are energy-burdened, and the average energy burden of moderate-income customers is well below six percent.[9]

PSE's EBA found that estimated energy-burdened customers use more energy on average than overall residential customers. Additionally, energy-burdened customers are more likely to be among already vulnerable customers, based on named community designations outlined in the Clean Energy Transformation Act ("CETA"): highly impact community ("HIC"),[10] high vulnerability populations ("High VP"),[11] and electric deepest need from PSE's 2021 Clean Energy Implementation Plan ("CEIP").[12]

Key findings are discussed below, and for more details see PSE's 2022 Energy Burden Analysis, Exh. BDJ-3.

B. Introduction

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Q. Why does PSE conduct the EBA?

A. PSE conducts the EBA as part of its effort to comply with RCW 19.405.120:

- all Washington electric utilities must provide energy assistance funding and programs to low-income households by July 31, 2021, and "[t]o the extent

[9] Exh. BDJ-3 at 17.

[10] *See* RCW 19.405.020(23); *see* RCW 19.405.140; *see* PSE 2021 CEIP, at 59-63, https://irp.cdn-website.com/dc0dca78/files/uploaded/2022_0201_Chapter3.pdf.

[11] RCW 19.405.020(40); *see also* PSE 2021 CEIP, at 51-59 (discussing PSE's breakdown of CETA's "vulnerable populations" into three categories (low, medium, and high) based on the frequency that each population category experienced a given metric).

[12] Customers in electric "deepest need" as defined by the methodology that PSE developed with its Equity Advisory Group, Low Income Advisory Committee, and Conservation Resources Advisory Group ("CRAG") in response to Condition 20 of the Final Order 08 in Docket UE-210795 ("CEIP Order 08").

practicable, priority must be given to low-income households with a higher energy burden"; [13]

- all Washington electric utilities are required to assess energy assistance available to low-income households across the state, the energy burden of low-income households, and the need for more assistance, and provide their findings to the Washington State Department of Commerce ("Commerce"); [14] and

- Commerce is required to compile and aggregate these data and publish biennial reports.[15]

Q. Has the Company provided a comprehensive EBA report to better understand the composition of PSE customers and their energy burden?

A. Yes. PSE submitted the 2020 EBA and findings in its 2022 general rate case. In addition, the Company submits its updated 2022 EBA in this docket as Exh. BDJ-3.

Q. Has PSE provided energy burden data for Commerce biennial reports per RCW 19.405.120?

A. Yes. PSE used its 2020 EBA to submit PSE's utility report[16] on low-income energy assistance that was used in Commerce's low-income energy assistance 2023 legislative report, which summarized data for 2019 and 2020 and was published on March 6, 2023.[17]

[13] RCW 19.405.120(2).
[14] RCW 19.405.120(4).
[15] RCW 19.405.120(3).
[16] Docket UE-200629, PSE Energy Assistance Report per RCW 19.405.120, available at https://apiproxy.utc.wa.gov/cases/GetDocument?docID=92&year=2020&docketNumber=200629.
[17] Washington State Department of Commerce, *Low Income Energy Assistance 2023 Legislative Report*, (March 6, 2023) available at https://app.leg.wa.gov/ReportsToTheLegislature/Home/GetPDF?fileName=CommerceReports_2023_Energy_Energy%20Assistance%20Report_Final_5001c308-6921-403b-b140-bd6e15d1a31a.pdf.

Q. When will PSE provide its next utility report to Commerce?

A. On December 4, 2023, Commerce made available final reporting template for utility low-income energy assistance reports. Utility reports will be due to Commerce by April 1, 2024.[18]

C. Methodology

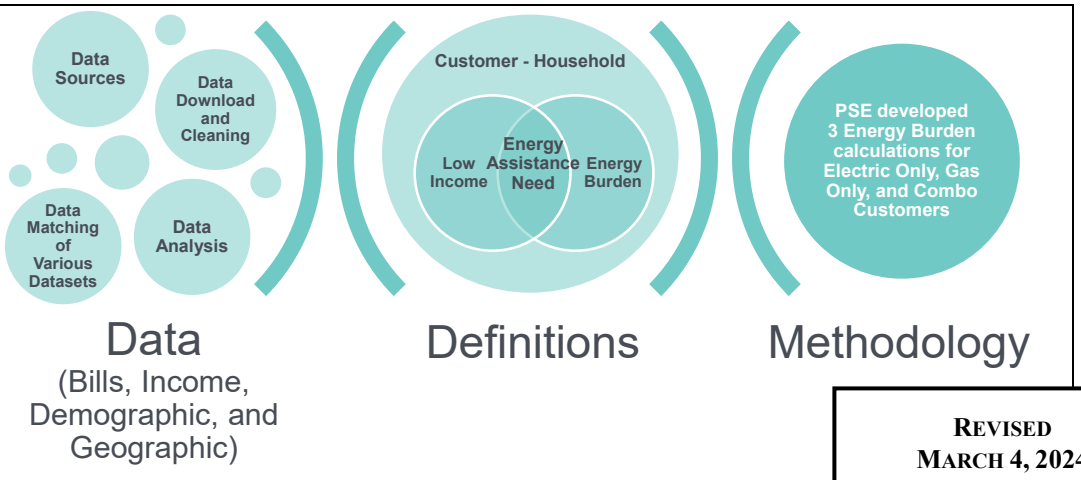
Q. How does PSE estimate customer energy burdens?

A. PSE compiled a master dataset of PSE's electric and/or gas residential customers within PSE service territory and all the relevant data to perform the EBA, such as usage, billing, estimated non-PSE energy costs, and estimated income. PSE used income estimates from third-party and public databases, PSE surveys, and PSE energy assistance applications to identify its low-income customers and to develop an analysis of its residential customers.

Figure 2 below illustrates the overview of the EBA methodology.

[18] Washington State Department of Commerce, *CETA Section 120 Energy Assistance*, https://www.commerce.wa.gov/growing-the-economy/energy/ceta/ceta-energy-assistance/.

Figure 2. PSE 2022 EBA Methodology Overview



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Source: PSE's 2022 Energy Burden Analysis (PSE's 2022 EBA), Exh. BDJ-3 at 8.

Pursuant to RCW 19.405.020, the definition of "low-income" is the higher of either 80 percent AMI or 200 percent federal poverty level, adjusted for household size.[19] In addition to the definition of low-income, RCW 19.405.020 also defines "energy burden,"[20] "energy assistance,"[21] and "energy assistance need."[22]

The following is the energy burden formula that PSE used in its EBA:

$$energy\ burden = \frac{annual\ home\ energy\ expenses}{annual\ household\ income}$$

[19] RCW 19.405.020(25).
[20] The share of annual household income used to pay annual home energy bills. RCW 19.405.020(17).
[21] A program undertaken by a utility to reduce the household energy burden of its customers. RCW 19.405.020(15).
[22] The amount of assistance necessary to achieve a level of household energy burden established by the department or commission. RCW 19.405.020(16).

Energy burden is limited to expenses for residential purposes. It includes any fuel source for energy and excludes non-energy utilities and transportation-related energy expenses.[23]

The following are the three energy burden formula permutations that PSE used in its EBA for electric only, gas only, and combined electric and gas customers:[24]

- PSE's Combined Electric and Gas customers:

$$Yearly \frac{PSE\ Electricity\ Bill + PSE\ Gas\ Bill + Other\ Heating\ Fuels\ Bill}{Income}$$

- PSE's Electric Only customers:

$$Yearly \frac{PSE\ Electricity\ Bill + Other\ Gas\ Bill + Other\ Heating\ Fuels\ Bill}{Income}$$

- PSE's Gas Only customers:

$$Yearly \frac{Other\ Electricity\ Bill + PSE\ Gas\ Bill + Other\ Heating\ Fuels\ Bill}{Income}$$

Commerce's threshold for determining energy assistance need, and for defining an "energy-burdened" customer, is a customer whose energy burden is greater than six percent. [25]

Q. What data sources did PSE use in its EBA?

A. PSE used the following in its 2022 EBA:

- *Income data*:
  - 2022 third-party data vendor;
  - 2022 PSE surveys;
  - 2022 PSE energy assistance applications; and

[23] Washington Department of Commerce, *Guidelines for RCW 19.405.120*, Version 03.09.2020 available at https://www.commerce.wa.gov/wp-content/uploads/2020/03/Guidelines-for-19.405.120.pdf.

[24] Note that current electric transportation-related energy expenses are included in the electric bills data.

[25] Washington Department of Commerce, *Guidelines for RCW 19.405.120*, Version 03.09.2020, at 4, available at https://www.commerce.wa.gov/wp-content/uploads/2020/03/Guidelines-for-19.405.120.pdf.

- 2018 Department of Energy / National Renewable Energy Lab Low-Income Energy Affordability Tool data ("DOE/NREL LEAD Tool Data").[26]

- **Billed amounts:**
  - 2022 PSE billing data; and
  - 2018 DOE/NREL LEAD Tool data - for data estimates PSE did not have, such as other heating fuels bill estimates, gas bill estimates for PSE's electric only customers, and electric bill estimates for PSE's gas only customers.

- **Geographic Information:**
  - 2010 U.S. census jurisdictions: census block groups aggregated to tracts; and
  - 2023 PSE premise locations aggregated to block groups.

- **Named Community Information:**
  - 2022 Washington State Department of Health environmental health disparities map data;
  - 2023 PSE vulnerable populations analysis per PSE 2021 CEIP Order 08; and
  - 2023 PSE electric deepest need analysis per PSE 2021 CEIP Order 08.

Q. What are the named community designations?

A. In conjunction with CETA requirements, PSE identified a set of geographies known as named communities that capture differences in vulnerability along a variety of spectrums. The two types of geographies that comprise named communities—highly impacted communities[27] and vulnerable populations[28]—are defined according to different criteria. Both highlight areas that are more likely to face barriers to program participation and energy security.

[26] Department of Energy, *National Renewable Energy Lab Low-Income Energy Affordability Data Tool*, available at https://www.energy.gov/eere/slsc/maps/lead-tool.

[27] *See* RCW 19.405.020(23); *see* RCW 19.405.140; *see In re Puget Sound Energy*, Docket UE-210795, PSE 2021 CEIP, Ch. 3 at 59-63.

[28] RCW 19.405.020(40); *see In re PSE*, Docket UE-210795, PSE 2021 CEIP, Ch. 3 at 51-59.

Highly Impacted Communities: A community designated by the department of health based on the cumulative impact analysis required by RCW 19.504.140 or a community located in census tracts that are fully or partially on "Indian country."

Vulnerable Populations: Communities that experience a disproportionate cumulative risk from environmental burdens due to: adverse socioeconomic factors, including unemployment, high housing and transportation costs relative to income, access to food and health care, linguistic isolation, and sensitivity factors, such as low birth weight and higher rates of hospitalization.

High VP: Census block groups with high level VPs. PSE located higher concentrations of vulnerable populations for those census block groups with a four or five for a given metric.

Electric deepest need: Customers in "deepest need" are electric residential customers defined by the methodology that PSE developed with its Equity Advisory Group, Low Income Advisory Committee, and Conservation Resources Advisory Group in response to Condition 20 of the 2021 CEIP Order 08.[29] PSE used a threshold of electric severe energy burden[30] for determination of deepest need threshold because it aligns with the goal of CETA to reduce energy burden. In addition, PSE used a spatial analysis technique to identify clusters of individual electric customers with severe energy burden and included in deepest need

[29] This joint collaboration and engagement with these advisory groups further demonstrates PSE's efforts in procedural justice, engaging in conversations and dialogue, seeking feedback to integrate into PSE's methodology.

[30] Here defined as 10 percent or more of household income allocated to household energy expenses.

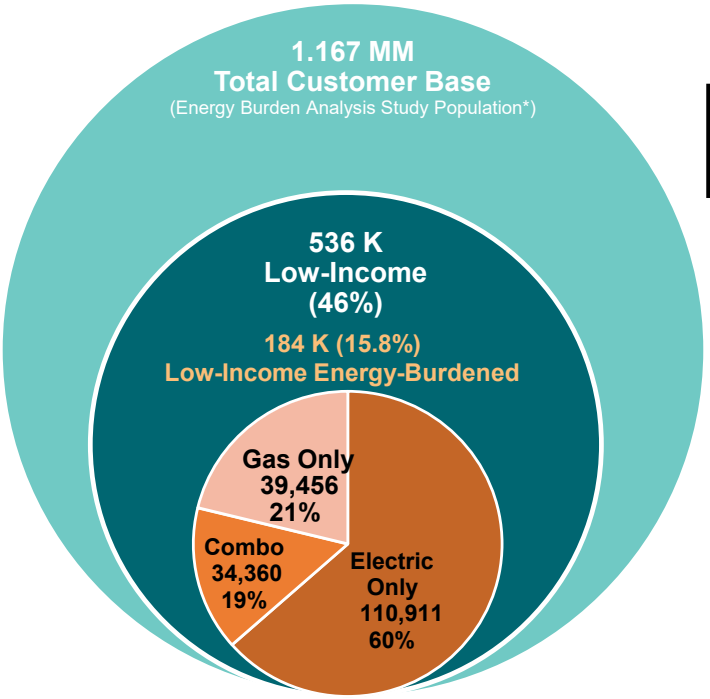
electric customers in the top 50th percentile of block groups with high counts of severe energy-burdened electric customers.

D. Results

Q. What are the key results from the 2022 EBA?

A. Figure 3 illustrates the summary results of PSE's 2022 Energy Burden Analysis.

Figure 3: Summary of PSE's 2022 Energy Burden Analysis Results



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Note: Energy Burden Analysis amounts to roughly 80 percent of total residential customer base (based on PSE's 2022 Form 10-K, Annual Report to the Securities and Exchange Commission) due to several data challenges.
Source: PSE's 2022 EBA, Exh. BDJ-3 at 14.

The following are key takeaways from the 2022 EBA, keeping in mind that these are estimates based on PSE's analysis:

1. About 536,000 (46 percent) of the population are estimated low-income customers.
2. About 184,000 (15.8 percent) are estimated low-income and energy burdened.

a. Out of all PSE's estimated energy-burdened customers, 98 percent are classified as estimated low-income.

b. Additionally, 88 percent of all energy-burdened customers are estimated to earn below 50 percent AMI.

3. About three quarters (79 percent) of the estimated low-income and energy-burdened customers are electric customers (Electric Only and Electric-Combo), as seen in Figure 3.

4. As income increases, the proportion of energy-burdened customers decreases.

a. To illustrate, 99 percent of customers in the 0-10 percent AMI bracket are estimated to be energy-burdened in the EBA; however, only 4 percent of customers in the 70-80 percent AMI bracket are estimated to be energy-burdened. See Figure 4 below.

Figure 4. Number of PSE customers estimated as low-income and energy-burdened by income bracket

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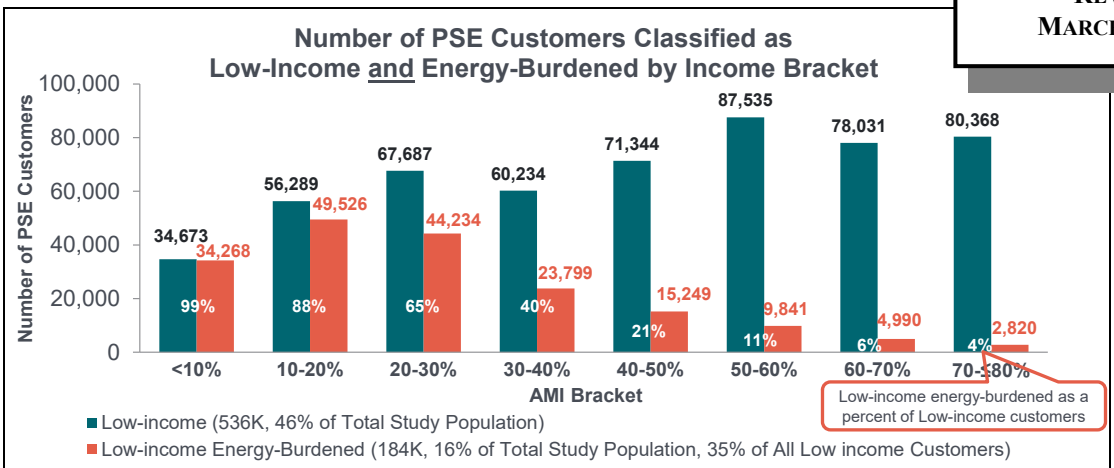


Source: PSE's 2022 EBA, Exh. BDJ-3 at 16.

5. Estimated low-income and energy-burdened customers use more energy on average than overall residential customers.

6. A geographical view of energy burden across PSE service territory highlights areas with more energy-burdened customers on average. While it is valuable to view energy burden across PSE's service area, the EBA also highlights that there are energy-burdened customers within each area. Within each census tract, energy burden tends to reflect right-skewed distribution shape. As a result, talking about "average" energy burden within any geography is misleading. Each geography will have many households with energy burden significantly higher than the average.

7. The median energy burden for all customers in 2022 EBA is 2.4 percent, where:

a. the median energy burden for estimated upper-income[31] customers is 1.5 percent;
b. the median energy burden for estimated moderate-income[32] customers is 2.1 percent; and
c. the median energy burden for estimated low-income customers is 4.4 percent,
    i. the median energy burden for customers who are estimated low-income but not estimated as energy-burdened is 3.3 percent; and
    ii. the median energy burden for customers who are classified as low-income and energy-burdened is 10.2 percent.

Q. How many customers are designated vulnerable when considering all populations of interest?

A. Combining PSE's EBA, named community analyses performed for CETA, and electric deepest need analysis performed for CEIP, PSE finds that based on PSE's current active residential customers (as can be seen in Figure 5):[33]

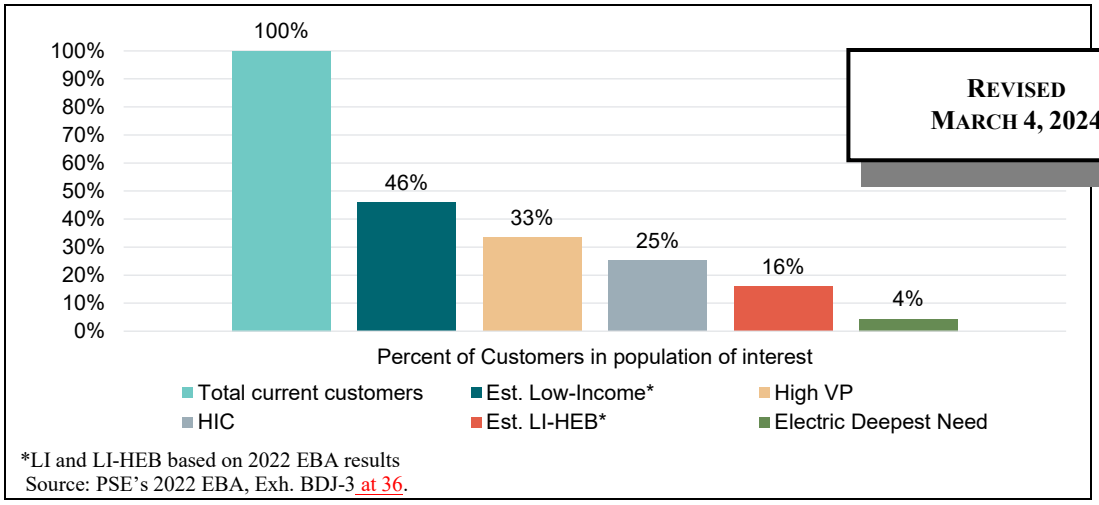
- 46 percent of PSE's current active residential customers are estimated low-income;
- 33 percent are designated to be in High VP;
- 25 percent are designated to be in HIC;
- 16 percent are estimated low-income and energy-burdened; and
- 4 percent are designated electric deepest need.

[31] Households with estimated income greater than 115 percent AMI.

[32] Households with estimated income between 80 percent and 115 percent AMI, per "affordable housing" rules. RCW 84.14.010(9).

[33] The 2022 EBA study population reflects about 80 percent of total residential customers in PSE's 2022 Form 10-K, while for this analysis, PSE is able to look at total current active residential customers. As of January 10, 2024, this is about 1.51 million customers. PSE applied findings from the 2022 EBA to estimate the number of low-income (LI) and low-income energy burdened (LI-HEB) customers, using 46 percent and 16 percent, respectively.

Figure 5. Proportion of PSE's current customers estimated in various populations of interest



*LI and LI-HEB based on 2022 EBA results
Source: PSE's 2022 EBA, Exh. BDJ-3 at 36.

Q. How are named community designations reflected in the estimated low-income and energy-burdened group?

A. Combining PSE's EBA and CEIP named community analyses, PSE finds that among the estimated low-income and energy-burdened customer group (Figure 6):

- about 34 percent of LI-HEB are in HIC;
- about 46 percent of LI-HEB are in High VP; and
- about 34 percent of LI-HEB who are also designated as electric deepest need.

In addition, the EBA found that estimated low-income and energy-burdened customers are significantly more likely to be an electric deepest need customer, than PSE's residential customers overall (Figure 6):

- for PSE's current residential customers overall, 4 percent are designated as electric deepest need;
- for PSE's estimated low-income customers, 10 percent are designated electric deepest need; and
- for PSE's estimated low-income and energy-burdened customers, 34 percent are designated as electric deepest need.

Figure 6. Customers in named community as a percent of total, low-income, and low-income and energy-burdened populations

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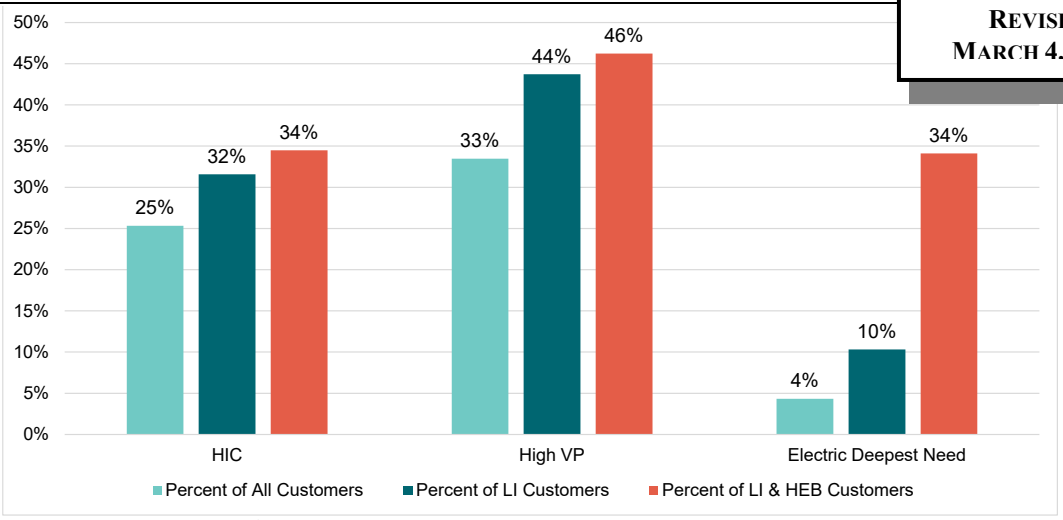
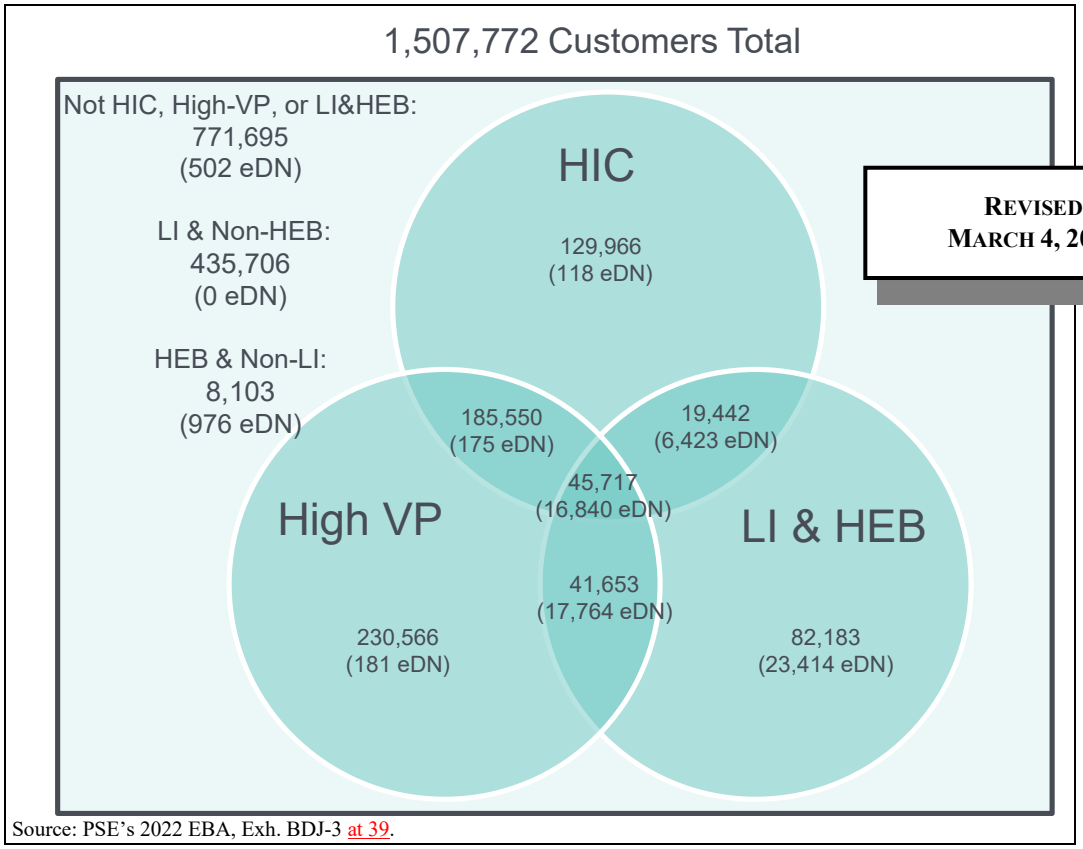


Source: PSE's 2022 EBA, Exh. BDJ-3 at 40.

Additionally, PSE's analyses also show that about 46,000 (or about 3 percent of total) customers of PSE's current residential customers are in all four populations of interest: HIC, High-VP, low-income, and energy-burdened, out of which 17,000 are also electric deepest need customers; see Figure 7.

Figure 7. Overlap between named communities and low-income & energy-burdened customers



Source: PSE's 2022 EBA, Exh. BDJ-3 at 39.

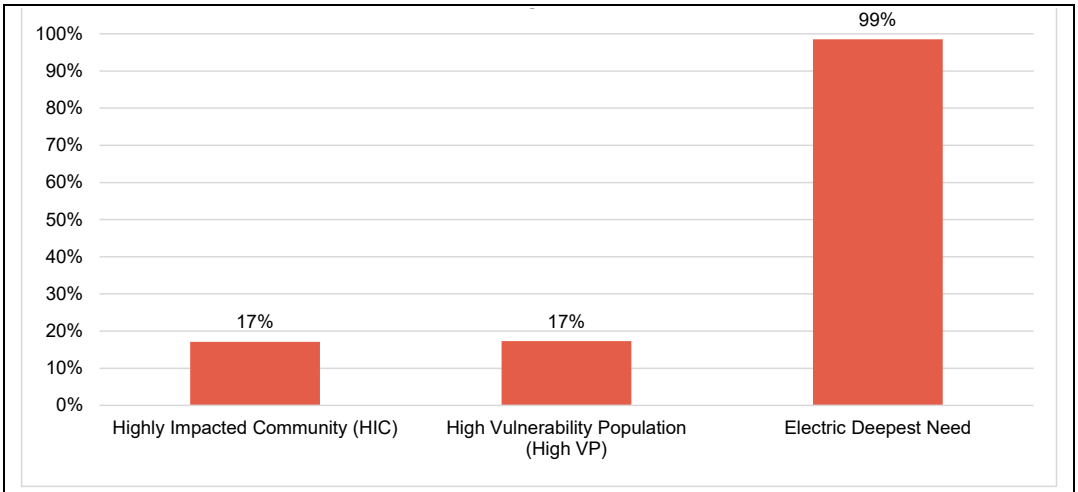
Q. How are estimated low-income and energy-burdened customers reflected in named communities?

A. PSE finds that based on PSE's current active residential customers (Figure 8):

- about 17 percent of customers in HIC are estimated low-income and energy-burdened ("LI-HEB");[34]
- about 17 percent of customers in High VP are LI-HEB; and
- about 99 percent of electric deepest need customers (64 thousand) are LI-HEB.

[34] Customers that are both estimated low-income and energy-burdened (with high energy burden ("HEB"), defined as energy burden above six percent).

Figure 8. Proportion of low-income and energy-burdened customers in named communities



Source: PSE's 2022 EBA, Exh. BDJ-3 at 41.

Q. What conclusions can be drawn from the 2022 EBA?

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A. Here are some of the key takeaways from the 2022 EBA.

- Most customers have low energy burden (over 84 percent).
- The majority of energy-burdened customers are estimated low-income (98 percent).
- While just over a third of estimated low-income customers are energy-burdened, energy burden tends to concentrate at lower end of income spectrum.
- Most energy-burdened customers are electric customers.
- Energy-burdened customers use more energy on average than overall residential customers.
- High energy burden is more likely among vulnerable populations in named communities.

In addition, from named community analyses for CETA, energy burden emerges among the highest factors for determining vulnerability designations and may be a helpful lead consideration to engage multiple dimensions of vulnerability in

PSE's service area.[35] Because PSE can estimate energy burden for residential customers, using this as a lead consideration may help address some of the concerns of census jurisdiction level designations (such as HIC and High VP) obscuring individual instances of vulnerability.[36] See the Prefiled Direct Testimony of Troy A. Hutson, Exh. TAH-1T, for more information about PSE's proposed energy-burden efficacy metric.

E. Applications

Q. How should the EBA results be used?

A. The EBA results can be used to understand the interconnection between home energy costs and affordability, estimate the number of low-income customers, their respective energy burdens, and energy assistance need. Additionally, the energy burden data set can also aid as a general tool to draw meaningful insight regarding the shared characteristics of higher energy-burdened customers and low- and moderate-income customers. This information can be used to address institutional and structural affordability issues through low- and moderate-income program design and development, as well as with outreach and targeted marketing for various programs such as energy efficiency, demand response, time varying rates, and other demand management and reduction products and services. Finally, updated energy burden analyses inform PSE's understanding of named community analyses per 2021 CEIP. Energy burden is a key vulnerability factor

[35] *In re PSE*, Docket 210795, PSE 2021 CEIP, at Ch. 3.
[36] *Id.*

identified in PSE's vulnerable population methodology, and severe energy burden is the main factor defining electric deepest need methodology.

Q. What are the concerns and shortcomings of the EBA?

A. The EBA estimates energy burden, demographic and shared characteristics information based on third-party data. While this information allows for broad understanding of customers and can be used to advance certain policies to increase affordability as well as marketing and outreach of programs, products and services, the EBA does not provide the customer level precision needed to use the data to confirm income levels, low- and moderate-income status, or energy burden. Therefore, the EBA should not be used to assume or confirm specific customer status with respect to income, characteristics, or demographics.

Q. How has PSE used its EBA?

A. In addition to RCW 19.405.120 reporting requirements, results of the EBA are used in PSE's CEIP (a four-year roadmap of clean electricity actions, programs and investments, which was filed with the Commission on December 17, 2021[37]) and in PSE's 2023 Biennial CEIP Update.[38] PSE has also utilized the EBA for residential rate design studies and for designing low-income program design, such as the Crisis Affected Customer Assistance Program ("CACAP"), arrearage management program, and the new six-income-tier Bill Discount Rate ("BDR"),

[37] *In re Puget Sound Energy*, Docket UE-210795, PSE 2021 CEIP, Ch. 3, available at https://irp.cdn-website.com/dc0dca78/files/uploaded/FCEIP%20Chapter%203.pdf.

[38] *Id.* at 2023 Biennial CEIP Update, available at https://www.pse.com/-/media/PDFs/CEIP/2023/001_BU23_Chapters_Final.pdf.

which aims to make utility bills more affordable for income-qualified customers. For details on PSE's low-income programs and proposed approaches for reducing energy burden via a combination of existing and new programs, see the Prefiled Direct Testimony of Carol L. Wallace, Exh. CLW-1T. In addition to low-income program design, the EBA has been used for customer engagement, targeted marketing and outreach of low-income customers, for conservation programs, and the TVR pilot and demand response pilot.[39] When pre-qualifying customers for income qualified programs, PSE requires customers to confirm their income through self-attestation to continue receiving benefits beyond a temporary period.

IV. PSE'S EQUITY CONSIDERATIONS FOR RESIDENTIAL RATES

Q. How has PSE considered equity in the development of its residential rates?

A. PSE's cost allocation and residential rates are developed based on the methodology as outlined in the cost of service rules as required by Ch. 480-85 WAC. While PSE complies with the Commission approved cost allocation, the Company offers an array of assistance programs that address both equity and affordability for its customers.[40]

Q. How do PSE's rates impact named communities and other priority groups?

A. Nearly 70 percent of low-income and energy-burdened customers can be classified as customers who are in highly impacted communities, high vulnerable

[39] To comply with paragraph 20 in Order 01 in Docket UG-230470.
[40] *See, e.g.*, Prefiled Direct Testimony of Carol L. Wallace, Exh. CLW-1T.

population, or electric deepest need categories.[41] While PSE's residential rates, coupled with high energy use by the customer, may produce energy burden for vulnerable customers in the aforementioned customer groups, the Company offers a variety of low-income assistance programs that help reduce energy burden and meet the affordability needs of these customers. Efficacy of PSE's low-income assistance programs in focusing on the populations of interest is provided below.

Q. How do PSE's low-income programs address both equity and affordability?

A. As discussed above, PSE conducted analyses to understand the proportion of customers who are in highly impacted communities, in high vulnerable population, are electric deepest need, are energy-burdened, and are estimated low-income customers.

PSE's energy assistance programs address affordability and equity by targeting these very customers. PSE's energy assistance programs are available to all low-income customers, many of which come from populations of interest. PSE's EBA found, as discussed above, that by providing energy assistance to low-income customers, where many of these low-income customers are also designated as either estimated energy-burdened, electric deepest need, in HIC, in High-VP, or in multiple of these populations of interest, PSE's available energy assistance programs address the affordability needs of vulnerable customers.

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[41] *See* Exh. BDJ-3 at 39.

PSE also leverages its analyses of the EBA, named community analyses, and the four energy justice tenets[42] to continue making progress towards improving energy equity in many aspects, including program design, customer outreach, marketing, and customer engagement, interested party engagements, and program benefits prioritization. More and other details on PSE's commitment to equity are discussed in the Prefiled Direct Testimony of Troy A. Hutson, Exh. TAH-1T, and the Prefiled Direct Testimony of Carol L. Wallace, Exh. CLW-1T.

Q. How many low income and energy burdened customers has the Company assisted?

A. From January 2020 to December of 2023, 100,325 unique active residential customers have received energy assistance from the following programs: PSE home energy lifeline program ("HELP"), federal low income energy assistance program ("LIHEAP"), PSE's CACAP, Commerce's COVID relief funds, and the warm home fund.[43] By definition, all these customers are low-income, and 52 percent are estimated as low-income and energy-burdened using the 2022 EBA.

[42] *See* Prefiled Direct Testimony of Troy Hutson, Exh. TAH-1T, for more information.

[43] Since PSE's new Bill Discount Rate program just launched in October 2023, currently limited data is available and therefore not included here.

Q. Using the 2022 EBA, what impact did low-income programs have on low income and energy burdened customers in 2022?

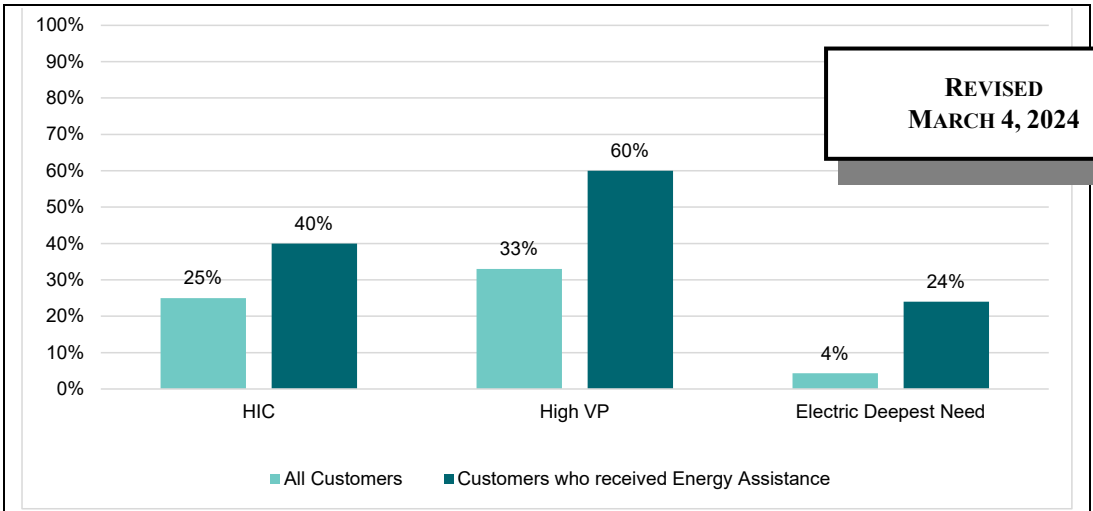
A. Estimated median energy burden of the 61,868 unique active residential customers who received energy assistance in calendar year 2022[44] was 7.9 percent, and after receiving assistance, their median energy burden decreased to 4.1 percent.

Q. What is the efficacy of PSE's low-income programs in meeting their objectives?

A. PSE's efforts to reduce customers' bills and lower overall arrearages have been effective at focusing on vulnerable customers. As seen in Figure 9 below, of the 100,325 unique residential customers that have received energy assistance in 2020-2023, 40 percent are in highly impacted communities (versus 25 percent overall customer base); 60 percent are high vulnerability (versus 33 percent overall customer base); and 24 percent are electric deepest need (versus 4 percent overall customer base). Also, as stated above, of these customers, 52 percent are also estimated as low-income and energy-burdened using the 2022 EBA.

[44] Customers who received energy assistance from the following programs: PSE HELP, LIHEAP, CACAPs, Commerce, and Warm Home Fund. *See* Prefiled Direct Testimony of Carol L. Wallace Exh. CLW-1T.

Figure 9. Proportion of energy-assisted customers in populations of interest



Source: PSE's 2022 EBA, Exh. BDJ-3 at 42.

While the efficacy of PSE's low-income programs in reaching vulnerable customers is robust, the effectiveness to reduce energy assistance need in PSE territory, has declined since the expansion of the low-income definition per CETA and RCW 19.405.020. Energy assistance need is defined as the amount of assistance necessary to achieve a level of household energy burden of equal to six percent.[45]

Q. Why has total energy assistance not declined?

A. While CETA states in RCW 19.405.120(2) that "[t]o the extent practicable, priority must be given to low-income households with a higher energy burden," energy assistance is not limited to low-income households with a higher energy burden. Whereas CETA (RCW 19.405.020(15)) defines "energy assistance" as "a program undertaken by a utility to reduce the household energy burden of its

[45] RCW 19.405.020(16); Washington Department of Commerce, *Guidelines for RCW 19.405.120*, Version 03.09.2020
available at https://www.commerce.wa.gov/wp-content/uploads/2020/03/Guidelines-for-19.405.120.pdf.

customers," RCW 80.28.068(5) requires low-income discount rate programs be available for all low-income customers *that request* assistance: "A residential customer eligible for a low-income discount rate must receive the service on demand." RCW 80.28.068 uses the expanded CETA definition of low-income per RCW 19.405.020.

Q. What are the consequences of offering low-income discounts to customers that are not energy burdened?

A. While energy assistance programs are available to all low-income customers, utilities are required to submit biennial plans to Commerce to improve the effectiveness of the assessed mechanisms and strategies toward meeting the energy assistance need, which is defined in RCW 19.405.020 and determined by Commerce[46] as the amount of energy assistance necessary to achieve a level of household energy burden equal to six percent. When energy assistance programs are available to all low-income customers, regardless of energy assistance need as defined using the energy-burden threshold, the efficacy of energy assistance program funding in the context of achieving energy assistance need goals, as set forth in CETA, would be reduced, thereby requiring higher total program costs to achieve CETA targets.

[46] Washington Department of Commerce, *Guidelines for RCW 19.405.120*, Version 03.09.2020 available at https://www.commerce.wa.gov/wp-content/uploads/2020/03/Guidelines-for-19.405.120.pdf.

Q. Is PSE proposing to offer low-income assistance programs only to energy burdened customers?

A. No. The Company offers an array of assistance programs to low-income customers to meet various customer needs, as discussed by Witness Carol L. Wallace in Exh. CLW-1T, which include – (1) providing direct bill assistance, (2) providing energy security, and (3) reducing the need for long-term assistance. However, as the number of customers at the upper end of the low-income bracket has increased, a larger number of non-energy burdened customers are qualified for low-income benefits, which means providing significant benefits to those customers could necessitate a substantial increase to program costs while reducing program cost efficacy to reduce energy burden of high energy-burdened customers to affordable level. Therefore, to further promote equity and affordability, the Company is considering how best to prioritize energy assistance to those low-income customers with high energy-burden, while continuing to provide low-income assistance on an as-needed basis for low-income customers who are not energy-burdened but nevertheless may require energy assistance.

Q. Can PSE continue towards a clean energy transition without over-burdening customers?

A. As PSE found in both the 2020 EBA and the 2022 EBA, a majority (over 80 percent) of PSE's residential customers are estimated to not be energy-burdened.

Figure 10. Estimated median energy burden of PSE's customer groups

Customer segment	Median energy burden
All customers in 2022 EBA	2.4%
Estimated Upper-income (income >115% AMI)	1.5%
Estimated Moderate-income (income >80% and ≤115% AMI)	2.1%
Estimated Low-income (income ≤80% AMI)	4.4%
Estimated Low-income & Non-HEB (EB≤6%)	3.3%
Estimated Low-income & Energy-burdened (EB>6%)	**10.1%**

Source: PSE's 2022 EBA, Exh. BDJ-3 at 19.

In addition, as discussed in the results section above and as seen in Figure 10, the median energy burden for upper-income customers and moderate-income customers is well below the six percent threshold for high energy burden (in the 1.5-2.5 percent range). For estimated low-income customers overall, and for estimated low-income customers that are not estimated to be energy-burdened the median energy burden is in the 3.5-4.5 percent range. However, the median energy burden for customers who are classified as low-income and energy-burdened is just above ten percent. Furthermore, for customers who received energy assistance from PSE in 2022, PSE was able to decrease by half their median energy burden from about eight percent to about four percent (which is below the six percent threshold target) by providing multiple energy assistance programs, as discussed above. Therefore, as long as PSE is able to effectively prioritize energy assistance to the low-income customers with high-energy burdens to help these customers achieve affordable energy burden levels, while continuing to provide low-income assistance on an as-needed basis for low-income customers who are not energy-burdened but nevertheless may require

energy assistance, PSE can continue to make progress towards a clean energy future while keeping bills affordable.

V. CONCLUSION

Q. Does this conclude your testimony?

A. Yes, it does.