

**EXH. BDJ-11
DOCKETS UE-22 ___/UG-22 ___
2022 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-22 ___
Docket UG-22 ___**

**TENTH EXHIBIT (NONCONFIDENTIAL) TO THE
PREFILED DIRECT TESTIMONY OF**

BIRUD D. JHAVERI

ON BEHALF OF PUGET SOUND ENERGY

JANUARY 31, 2022

Energy Burden Analysis ("EBA") Report

Calendar Year 2020



January 14, 2022



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Legal and regulatory context

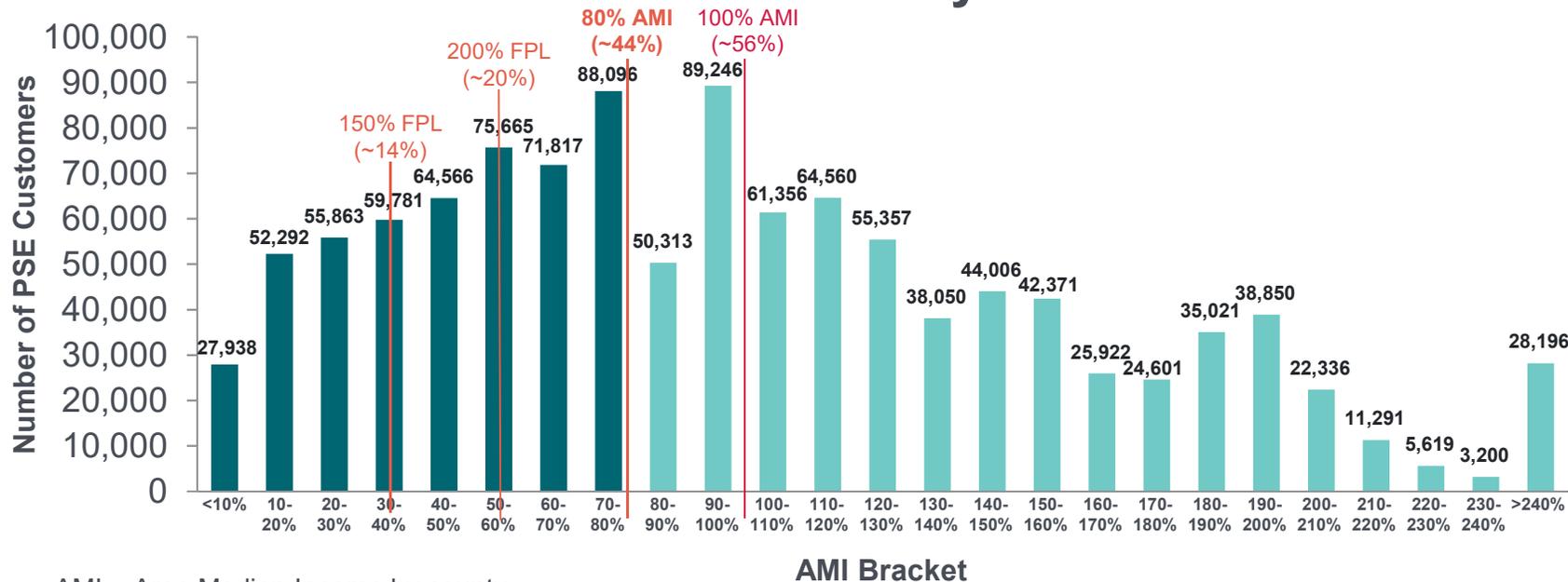
- Washington State’s Clean Energy Transformation Act (“CETA”) Section 12 (Energy assistance for low-income households) requires all State’s electric utilities to:
 - Provide energy assistance funding and programs to low-income households by July 31, 2021 (“*to the extent practicable, priority must be given to low-income households with a higher energy burden*”); and
 - 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”). Commerce is required to compile and aggregate these data and to publish biennial reports.
- Senate Bill 5295 (Regulatory Reform Bill SB 5295) requires PSE to propose a low income discount rate for eligible low-income and low-income senior customers.
 - SB 5295 points to RCW 19.405.020 which defines low income, energy burden, energy assistance need, and energy assistance. Commerce provides further guidelines on these definitions.

WA State Legislature RCW 19.405.020 - Key Definitions

- Section (15) "**Energy assistance**" means a program undertaken by a utility to reduce the household energy burden of its customers.
- Section (16) "**Energy assistance need**" means the amount of assistance necessary to achieve a level of household energy burden established by the department or commission.
- Section (17) "**Energy burden**" means the **share of annual household income used to pay annual home energy bills**.
- Section (25) "**Low-income**" means household incomes as defined by the department or commission, provided that the definition may **not exceed the higher of eighty percent of area median household income or two hundred percent of the federal poverty level, adjusted for household size**.
 - Both, Commission and Commerce, are assessing utility programs to meet the more inclusive definition

Defining low-income based on 80% AMI threshold is more inclusive and allows PSE to provide assistance to more customers

Number of PSE Customers by Income Bracket



- AMI = Area Median Income by county
- FPL = Federal Poverty Level guidelines – used by federal agencies for determining eligibility for federal assistance programs.

*Note: Energy burden analysis includes roughly 80% of total residential customer base (based on 2020 10K) because of several data challenges



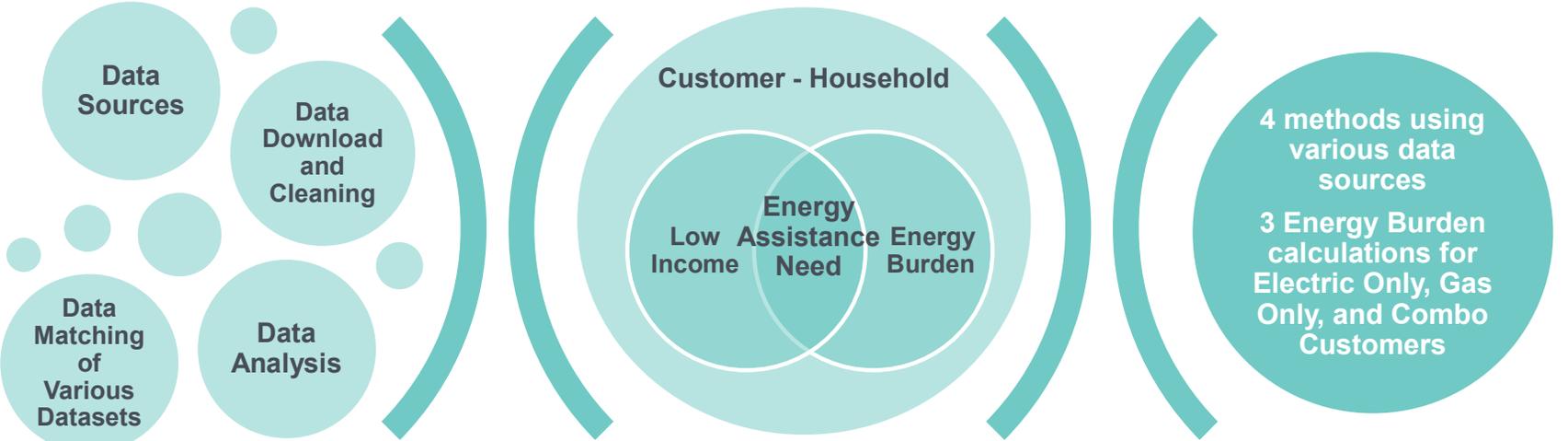
Defining Energy Burden

- A household's energy burden (EB) is the **percentage of income spent on home energy bills**.
- Commerce set the threshold for determining energy assistance need at **6% energy burden**.
- **Customers with energy burden of 6% or more are defined as energy-burdened.**
 - This definition comes from a widely accepted principle that total shelter costs should not exceed 30 percent of income and that utility costs should not exceed 20 percent of those shelter costs (i.e. 30% x 20% = 6%)

Energy Burden Equation:

$$\frac{\text{Annual (Electricity Bill + Gas Bill + Other Heating Fuels Bill)}}{\text{Annual Income}}$$

Energy Burden Analysis Overview



Data

(Bills, Income, Demographic, and Geographic)

Definitions

Venn Diagram is for illustrative purpose only. It is not to scale.

Methodology

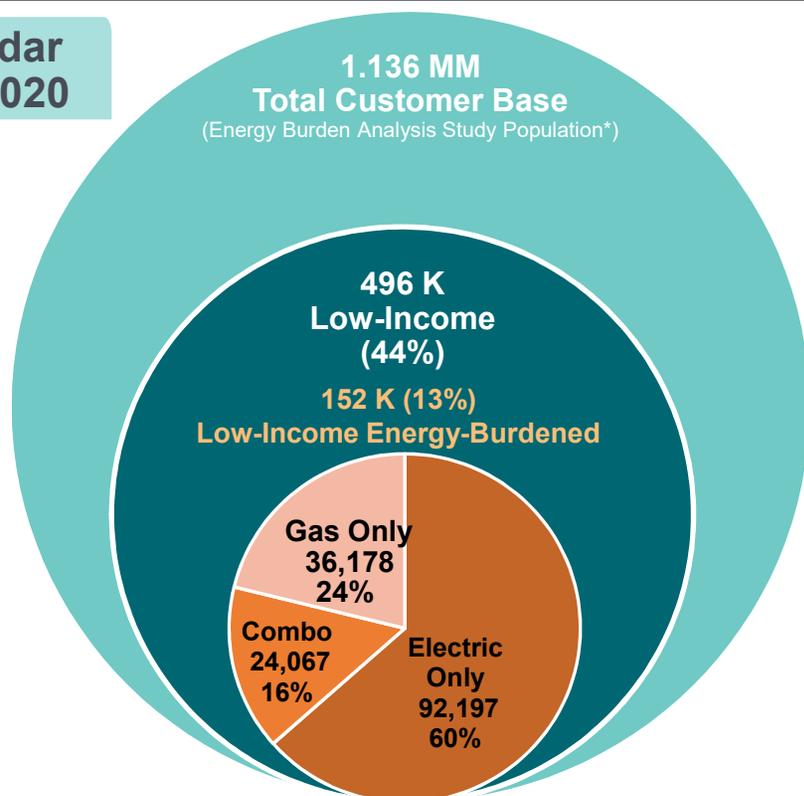
PSE's 2020 Energy Burden Analysis: Summary of Results

- Households classified as low-income per WA CETA's new definition:
 - About **496K (44%)** of PSE's residential customers in the EBA study population* were estimated to earn below 80% Area Median Income ("AMI") – i.e., **classified as low-income**.
 - By utility service type: 52% of Electric Only, 26% of Gas Only, and 23% of Combined Electric and Gas ("Combo") customers.
- Energy-burdened households:
 - About **152K** of PSE's residential customers in the EBA* are estimated to be **energy-burdened and low-income**.
 - That's about **13%** of total EBA study population, or **31%** of customers classified as low-income.
- Low-income and energy-burdened customers by utility service type:
 - Out of all customers estimated to be energy-burdened and low-income, 60% are PSE's Electric Only customers; 24% are PSE's Gas Only customers; and 16% are PSE's Combined Electric and Gas customers.

*Note: Energy Burden Analysis amounts to roughly 80% of PSE's total residential population based on 2020 10K.

PSE's 2020 Energy Burden Analysis: Summary of Results in graph

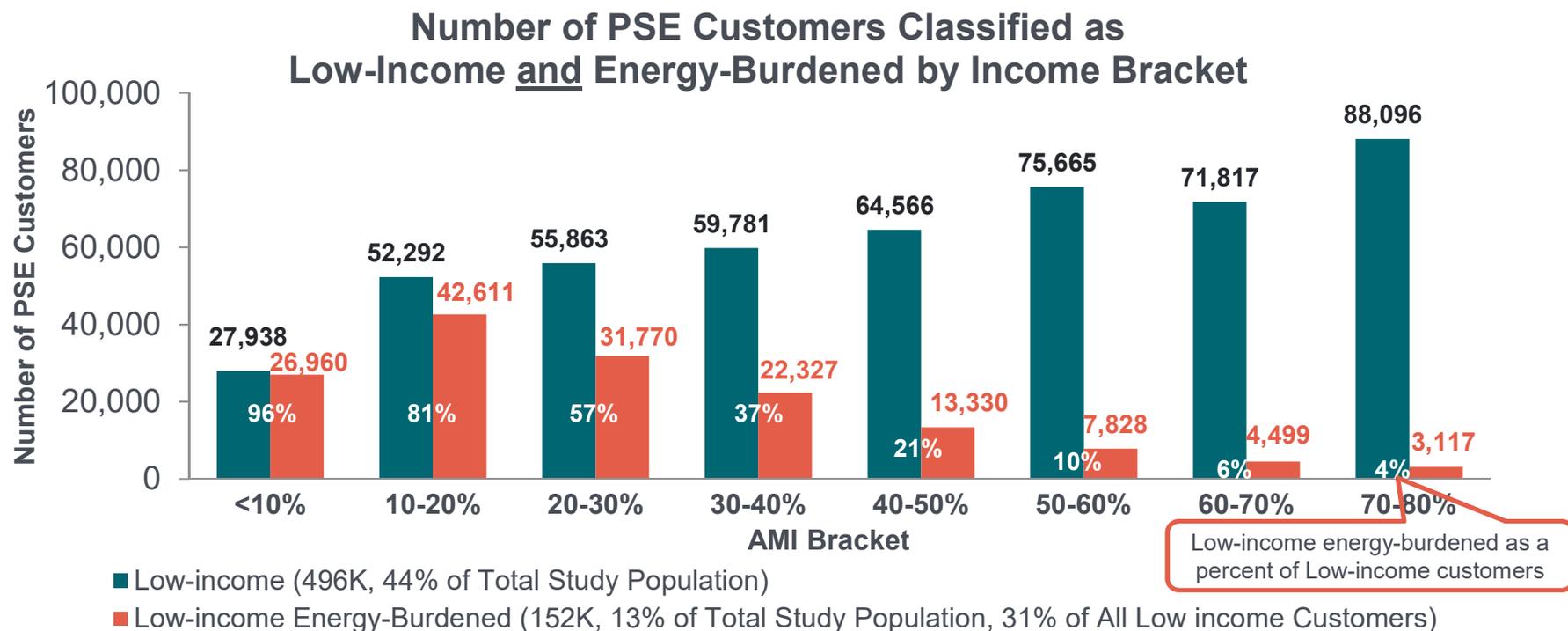
Calendar
Year 2020



The Who & Why

- Most customers have low energy burden, and **14% are estimated to be energy-burdened**
- **Majority of energy-burdened** customers are classified as **low-income**
- While **a third of 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
- **Energy burden over 6% is more likely among already vulnerable customers** (based on ethnic background, education, homeownership, dwelling type, and age)

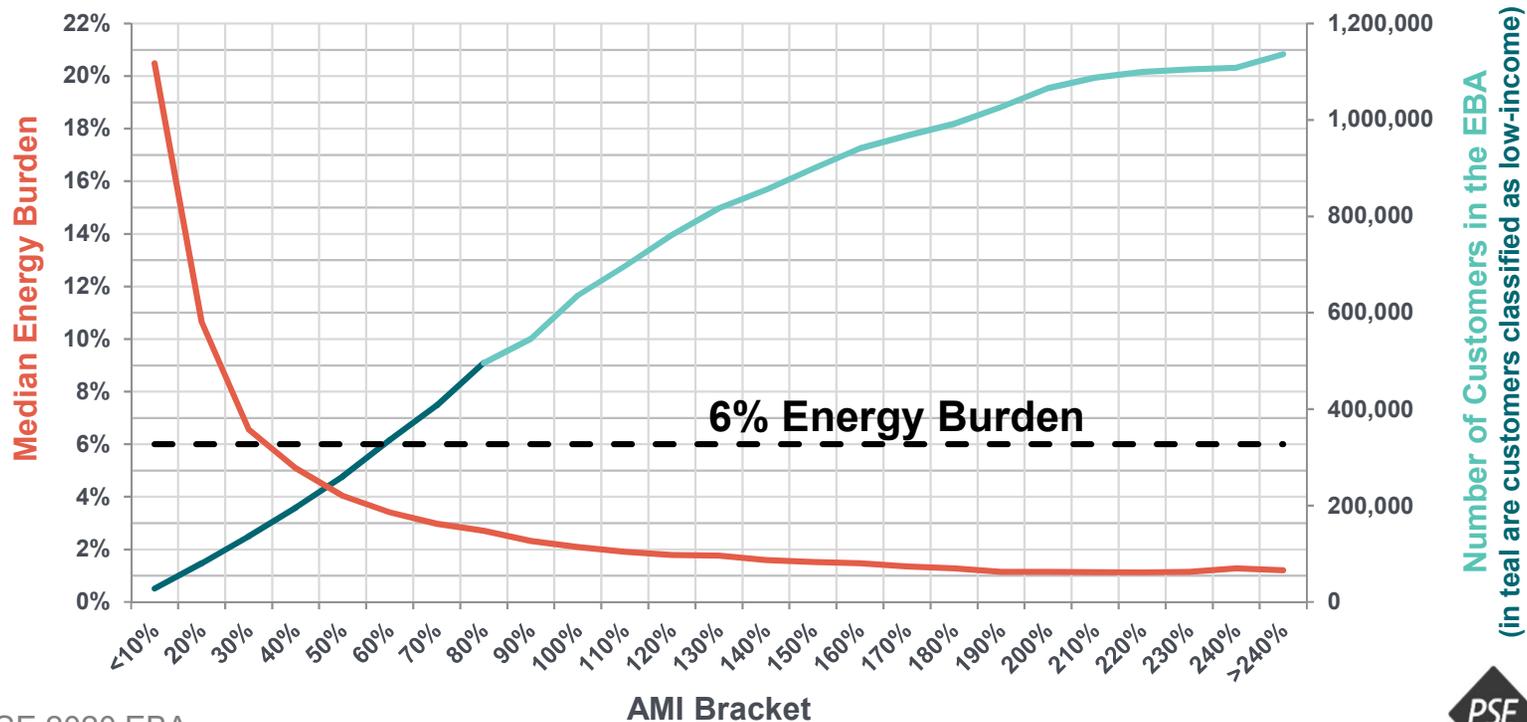
As income increases, the proportion of energy-burdened customers decreases



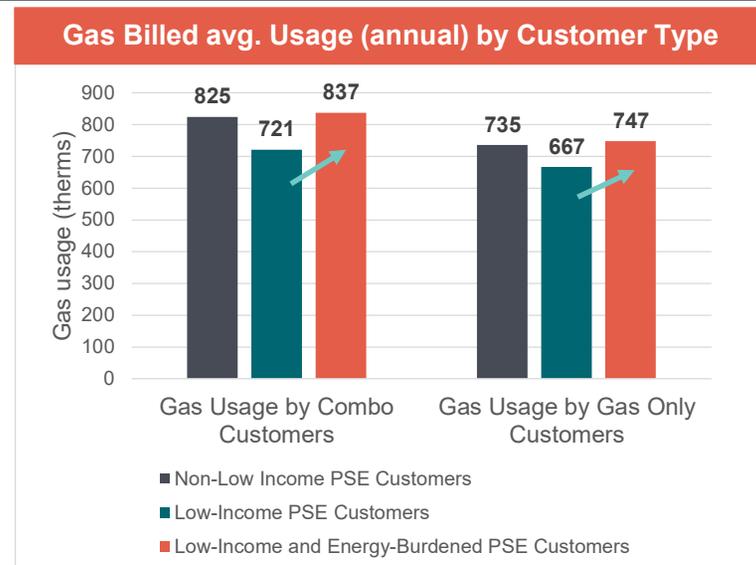
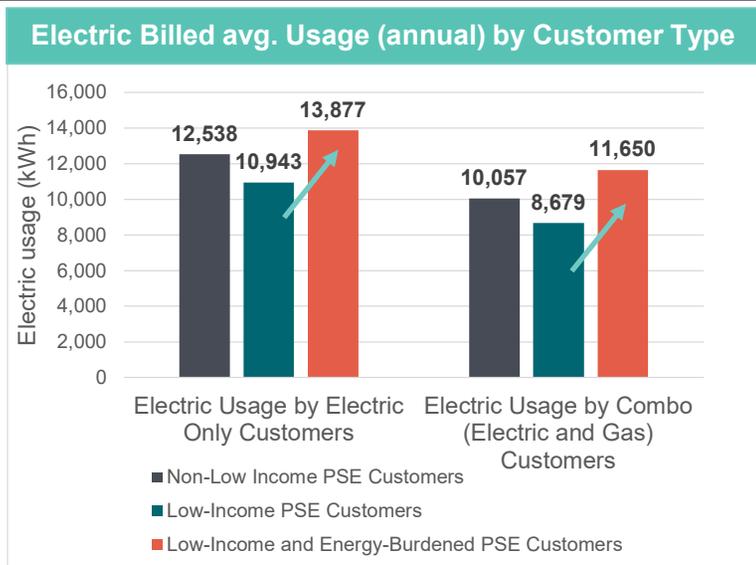
*Note: Energy burden analysis includes roughly 80% of total residential customer base (based on 2020 10K) because of several data challenges

Median energy burden decreases significantly with increasing AMI, and for customers in the 0-30% AMI range, *median* energy burden is above 6%

**Cumulative Number of PSE Customers
versus Median Energy Burden by Income Bracket**



Energy-burdened customers use more energy than overall EBA study population



- On average, Electric Only customers' usage is higher than Combo customers' electric usage.
- Classified low-income energy-burdened customers' electric usage is higher than for overall low-income customers in the EBA by about 31% on average
- Classified low-income energy-burdened customers' gas usage is higher than for overall low-income customers in the Energy Burden Analysis by about 13% on average

Energy Burden by Demographic Characteristics

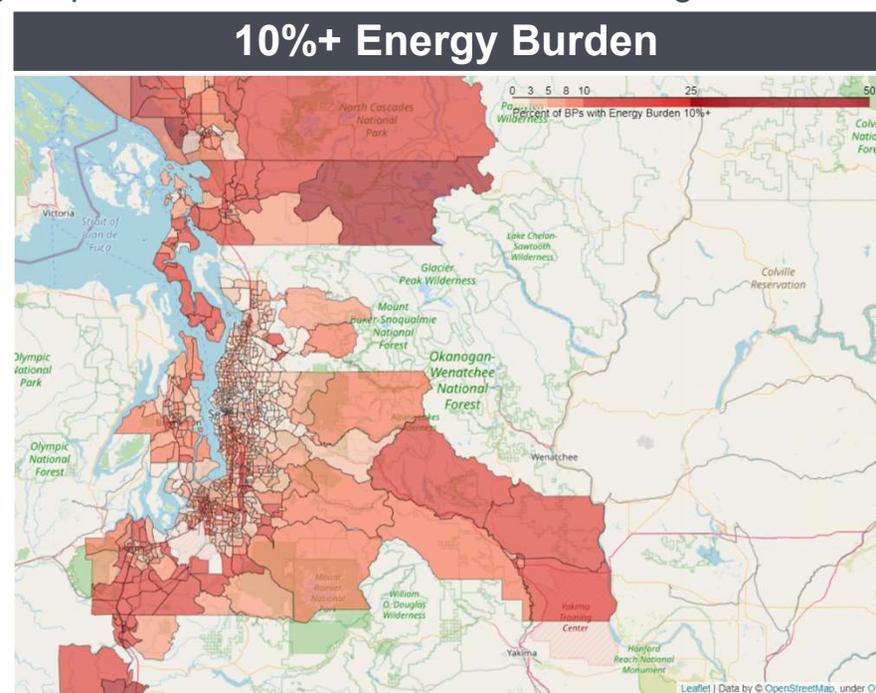
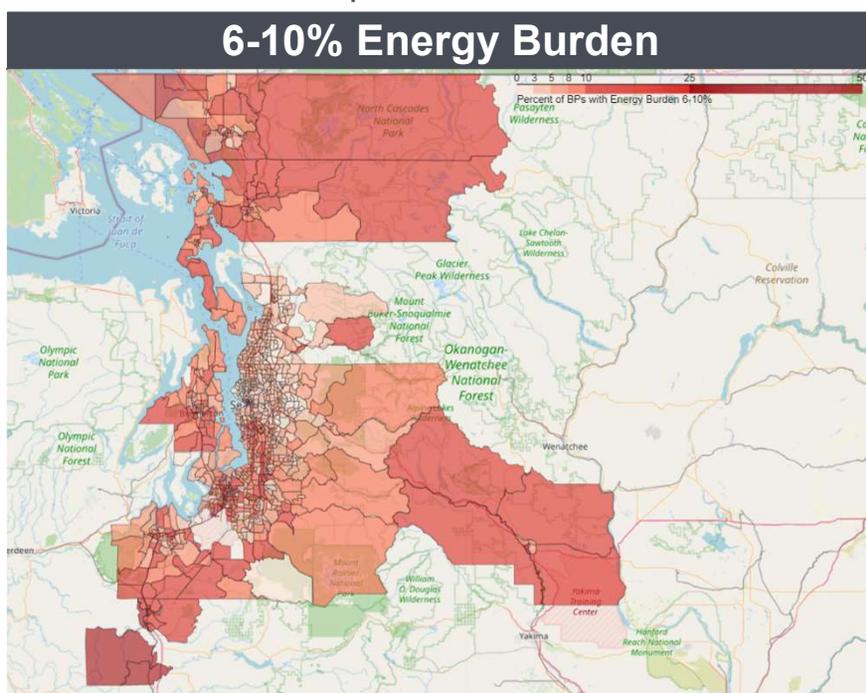
- **Racial Equity:**
 - Across PSE's Service Area, the percentage of **Hispanic or Black/African American** populations in a census block group **shows some correlation with higher energy burden**.
 - The correlation is less pronounced for **Hawaiian/Pacific Islander** and **American Indian/Alaskan Native populations**.
- **Education Attainment:**
 - Customers with **high school diploma or less** educational attainment are more likely to be energy-burdened (customers with high school or lower education make up **48%** of energy-burdened customers vs. 26% of total EBA study population).
- **Housing:**
 - Housing Tenure: Energy-burdened customers are more likely to be **renters** (make up **19%** of energy-burdened population vs. 11% of total EBA study population); and
 - Building Type: Energy-burdened customers are more likely to live in **mobile housing** (**14%** of energy-burdened population vs. 5% of total EBA study population).
- **Occupation:**
 - Customers who are **retired**, and possibly on limited fixed-income, are more likely to be energy-burdened (retired customers make up **31%** of energy burdened customers vs. 18% of total EBA study population).
- **Seniors (62+):**
 - Seniors make up about **30%** of total EBA study population (**~342K**)
 - When segmenting the Senior population, over half (**57%**) can be classified as low income, and **20%** as low-income and energy burdened.

Summary of Customer Characteristics

- **Energy Burden and Customer Usage:**
 - Average **electricity usage for energy-burdened customers is almost 40% higher** than for non-energy-burdened customers across all income groups; however, the difference in average gas usage is less pronounced.
 - Customers classified as **low-income energy-burdened tend to use 31% more electricity and 13% more gas** compared to average population of customers classified as low-income.
- **Energy Burden within two lowest income brackets:**
 - Almost three quarters (**74%**) of all PSE customers in the lowest income bracket (Tier 1: <30% AMI group) **are energy-burdened**.
 - In the second lowest income group (Tier 2: 30-50% AMI group), almost a third (**29%**) of all PSE customers are energy-burdened.

A geographical view of Energy Burden across PSE service territory highlights areas with more energy-burdened customers on average

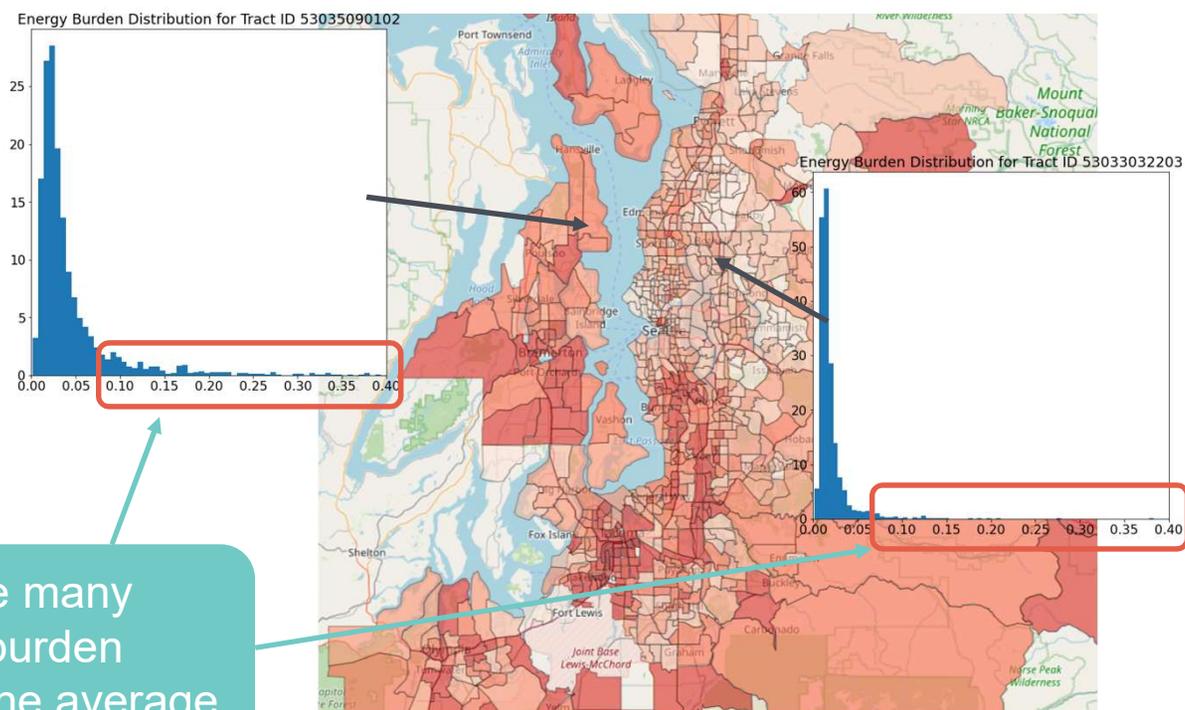
- Interactive maps illustrate census tracts with higher portions of PSE customers in the ranges of:



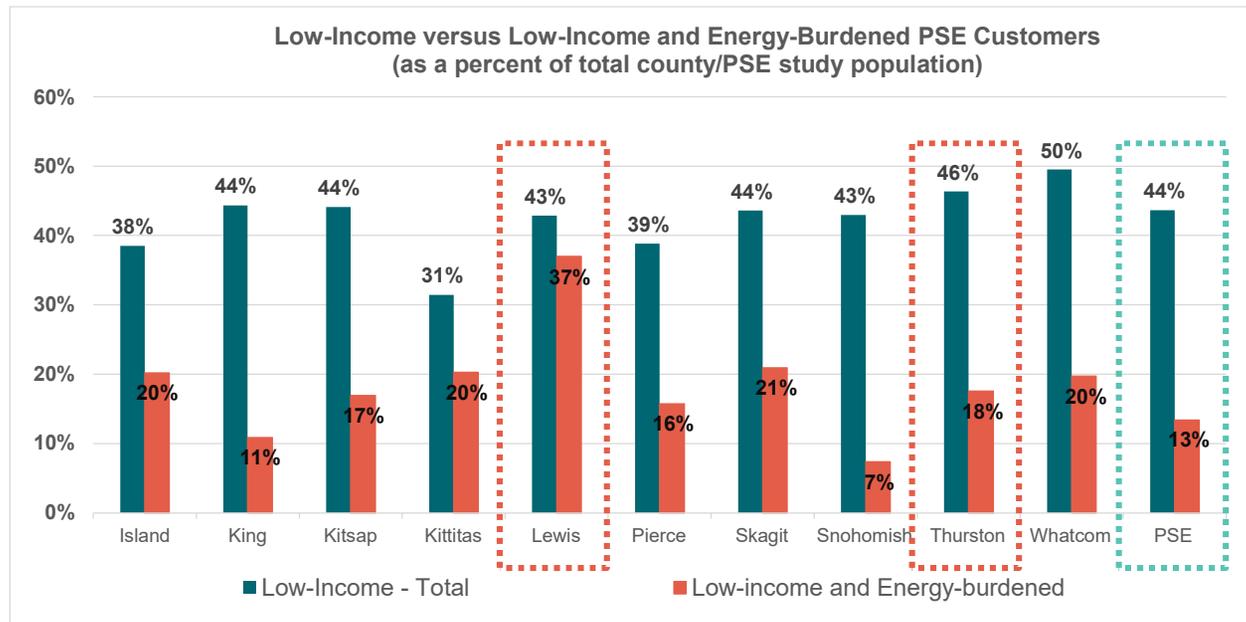
There are energy-burdened customers **within** each area

- Within each census tract, energy burden tends to reflect right-skewed 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



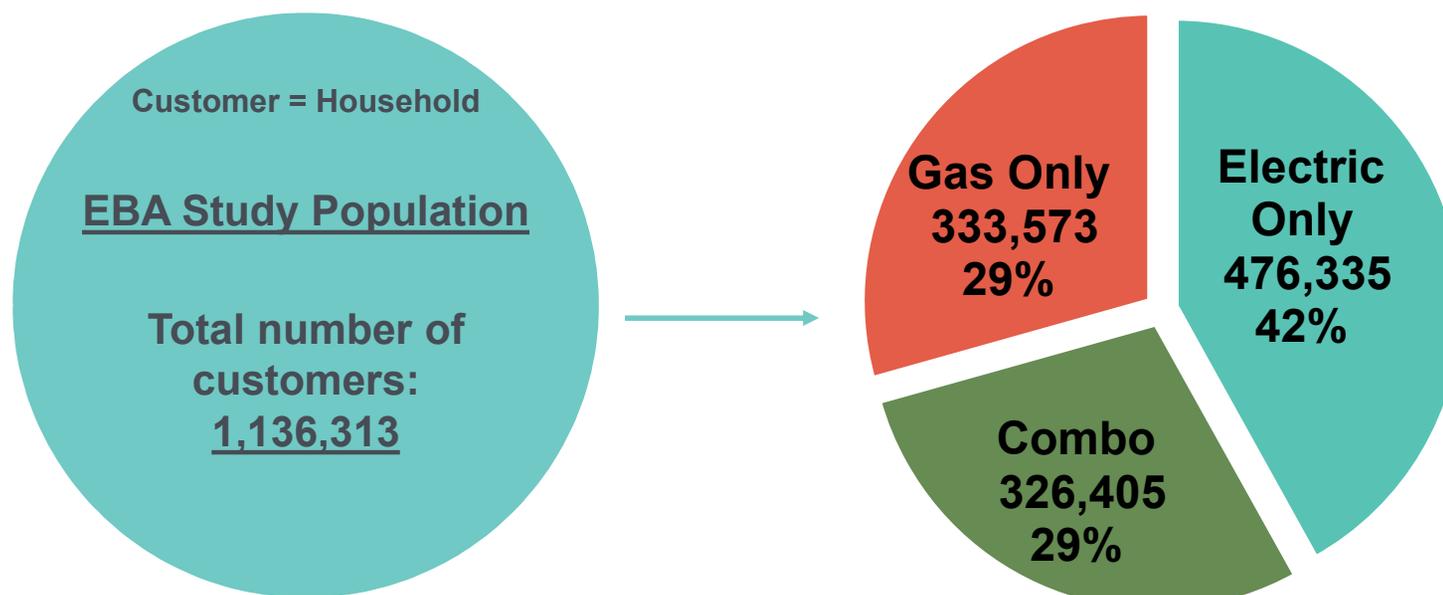
Comparisons by county also show the importance of identifying customers classified as low-income and their energy burdens



- Thurston County has the highest percent of customers (46%) classified as low-income, and 18% were estimated to be energy-burdened.
- Lewis County has a lower percentage of customers classified as low-income (43%) and a higher percentage classified as low-income and energy-burdened (37%).

EBA analyzed PSE residential customers

- The EBA analyzed PSE's residential customers with available data



Household (HH)

Residential PSE customer, identified by business partner ID

- Business partners (BP) with single customer account (CA) holders only

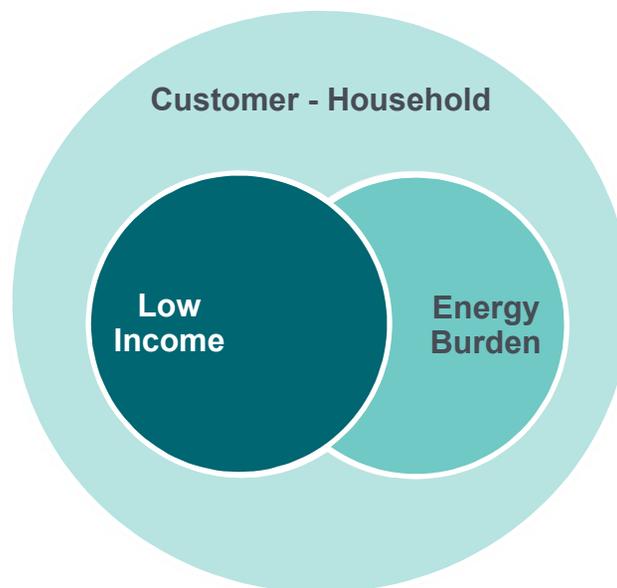
*Note: Energy burden analysis includes roughly 80% of total customer base (based on 2020 10K) because of several data challenges

Defining low-income in the EBA

Low-income (LI)

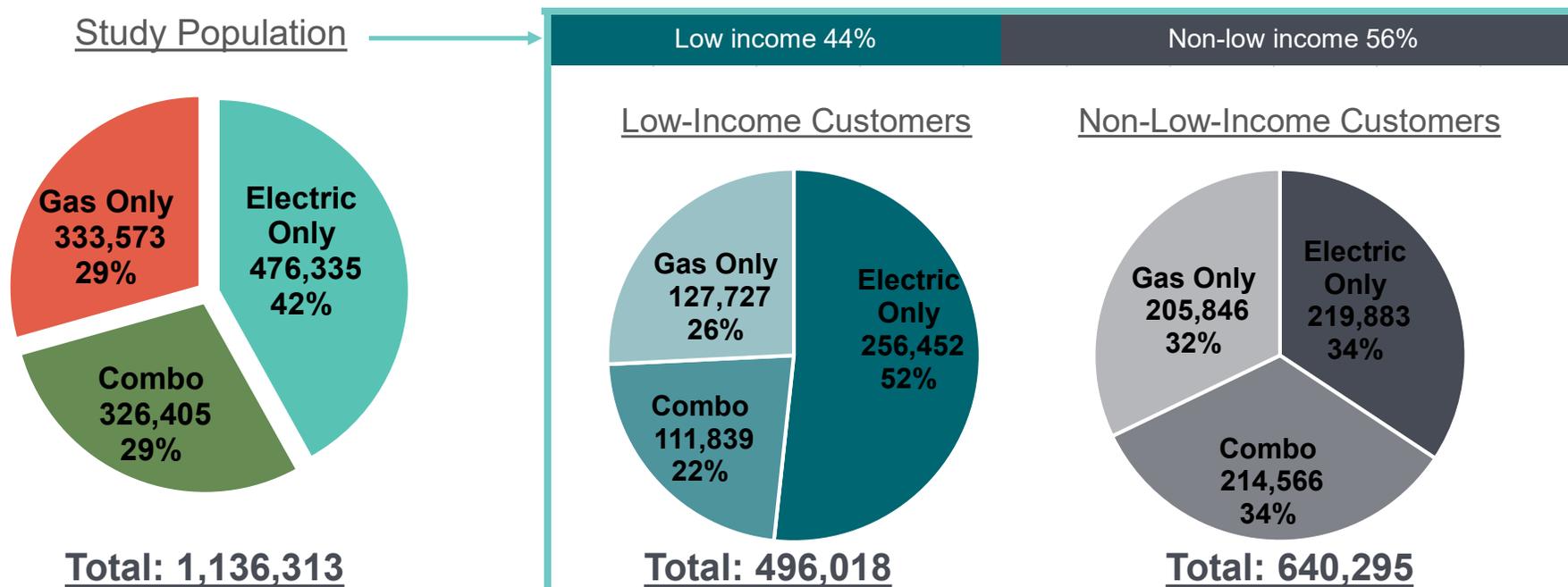
HHs with annual income $\leq 80\%$ area median income (AMI)

- CETA: AMI $\leq 80\%$ or $\leq 200\%$ Federal Poverty Level (FPL), whichever is highest, adjusted for HH size



Venn Diagram is for
illustrative purpose only.
It is not to scale.

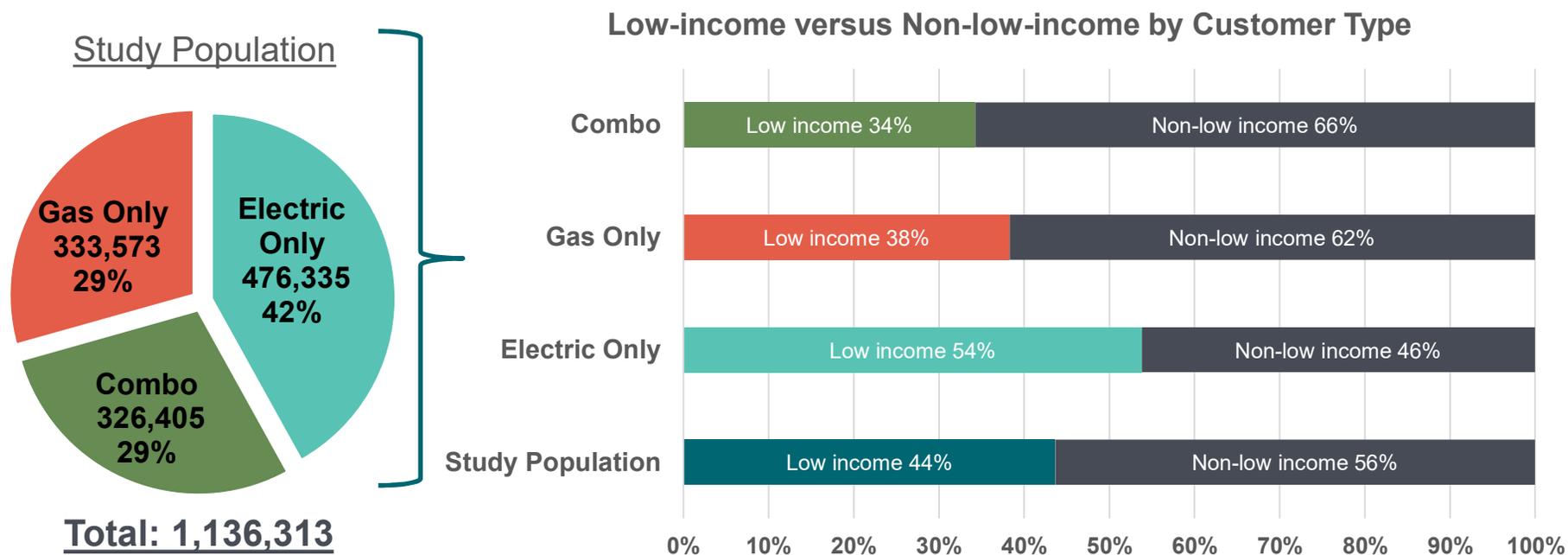
About 44% of customers in the EBA are classified as low-income, of which nearly three quarters are electric customers



- About **74%** of Total Number of Customers in the EBA are PSE's Electric Customers (Electric Only and Electric-Combo)



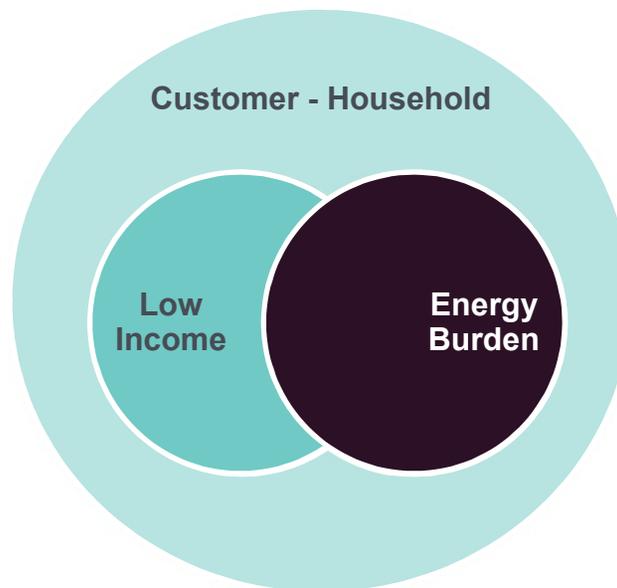
Within Service Type segments: customers classified as low-income make up 54% of Electric Only, 38% of Gas Only, and 34% of Combo customers



Defining energy-burdened customers in the EBA

Energy Burden (EB) Annual home energy expenses as a % of annual HH income

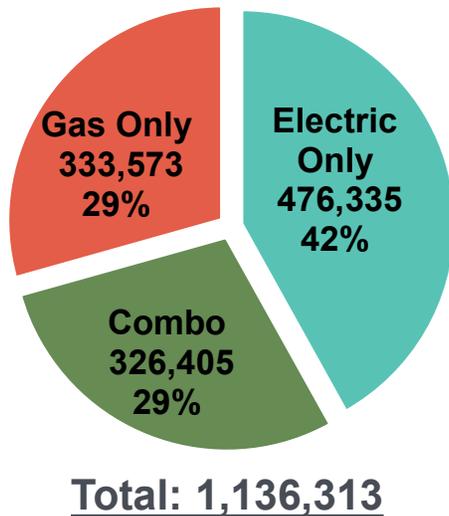
- **Energy-burdened:** Households with energy burden above 6% [CETA and Commerce]



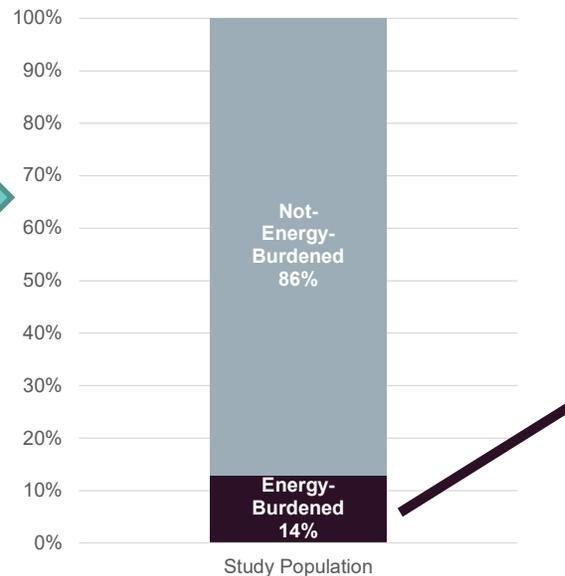
Venn Diagram is for illustrative purpose only.
It is not to scale.

Most customers have estimated low energy burdens (86% of customers have estimated energy burden below 6%)

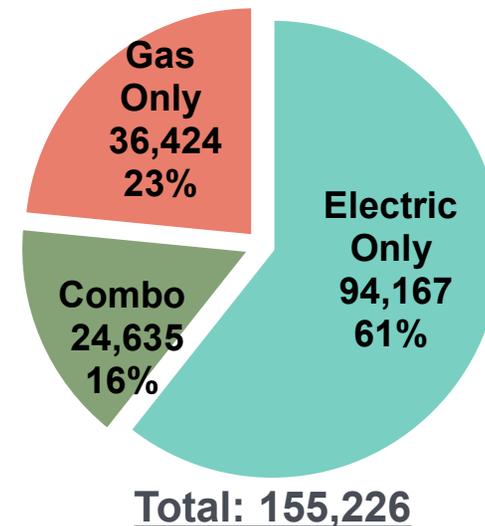
Study Population



Energy-Burdened versus Not-Energy-Burdened by Customer Type



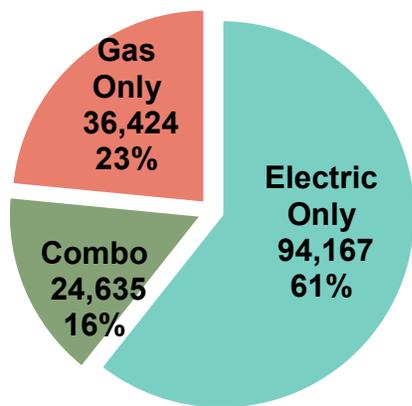
Energy-Burdened Customers



About 14% of PSE's total customers in the EBA are energy-burdened, of which over 60% are Electric Only.

Most energy-burdened customers are estimated low-income

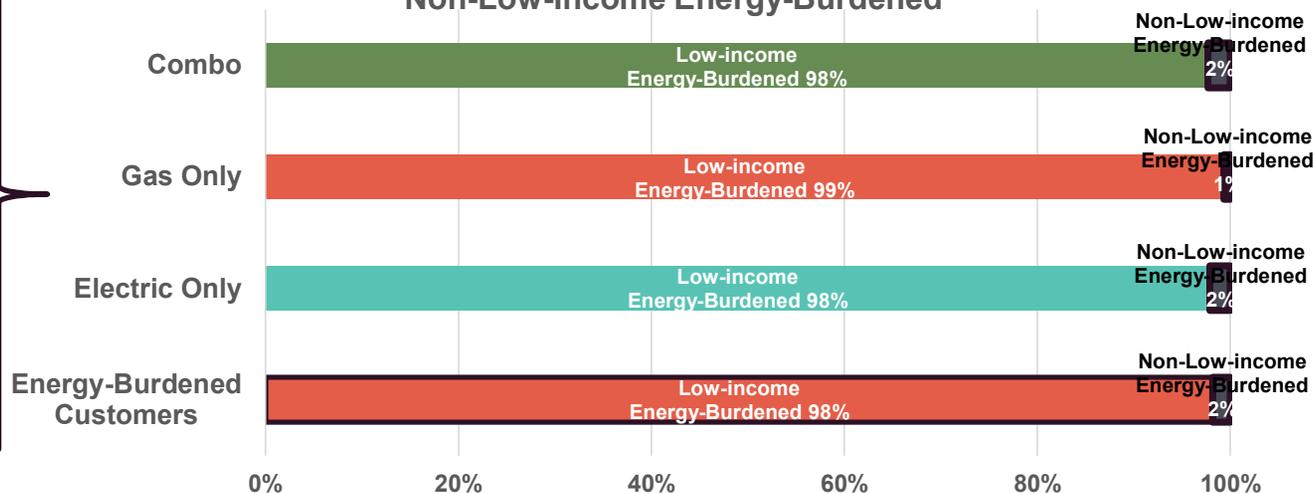
Energy-Burdened Customers



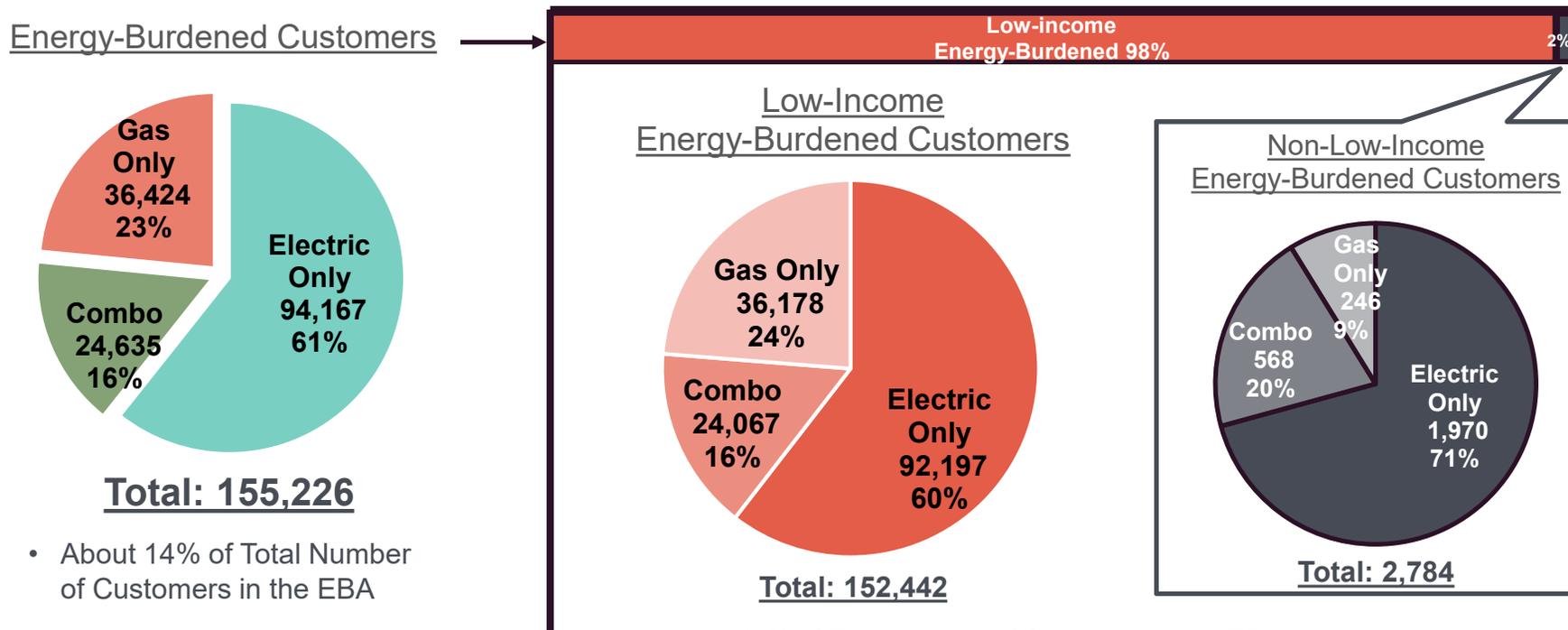
Total: 155,226

- About 14% of Total Number of Customers in the EBA

Low-Income Energy-Burdened versus Non-Low-Income Energy-Burdened



About 13% of PSE’s customers in the EBA are classified as low-income and energy-burdened, out of which 60% are Electric Only

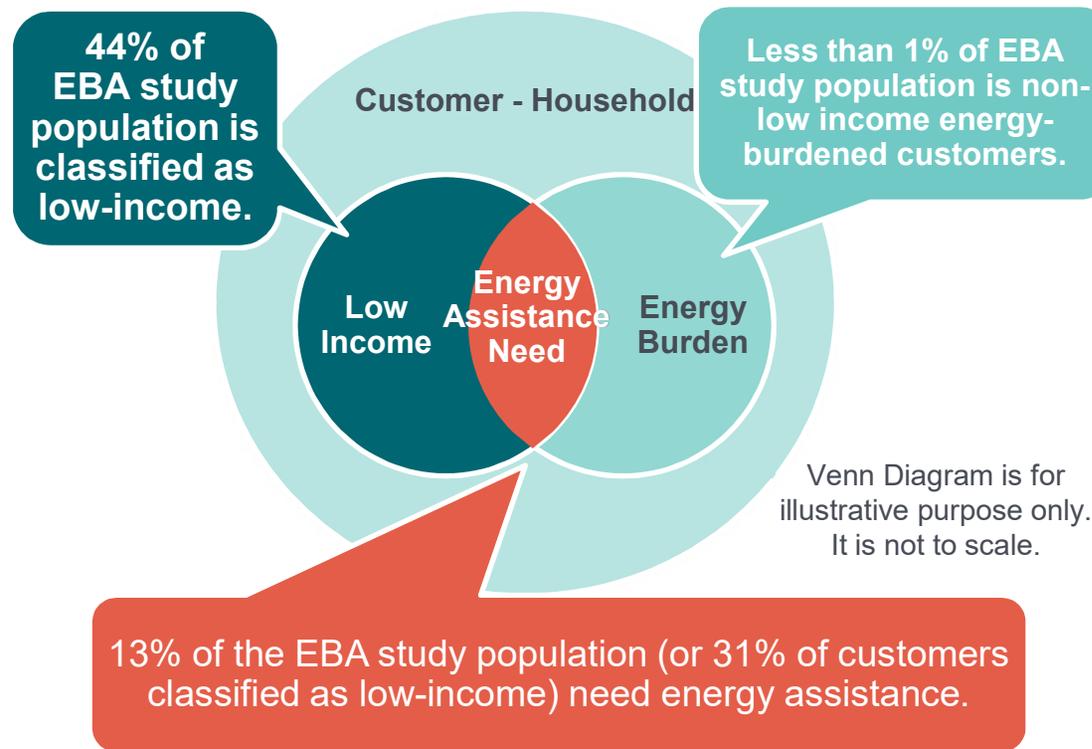


- About 14% of Total Number of Customers in the EBA

- About **13%** of Total Number of Customers in the EBA
- About **98%** of All Energy-Burdened Customers
- About **31%** of All Customers classified as Low-Income

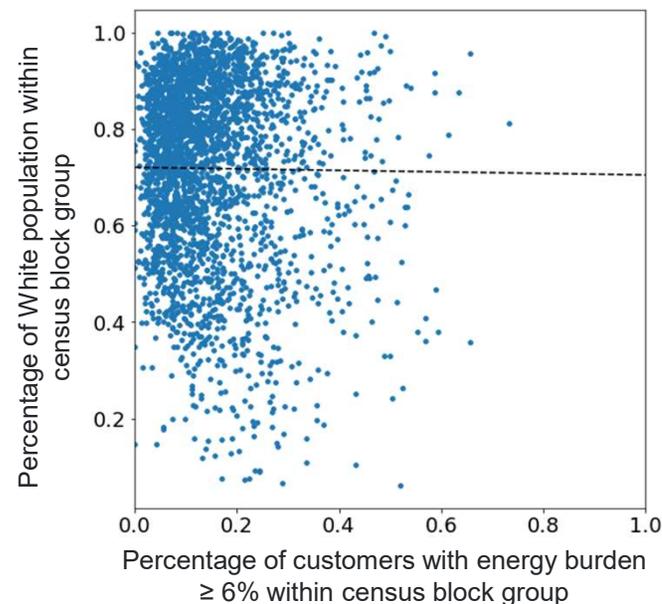
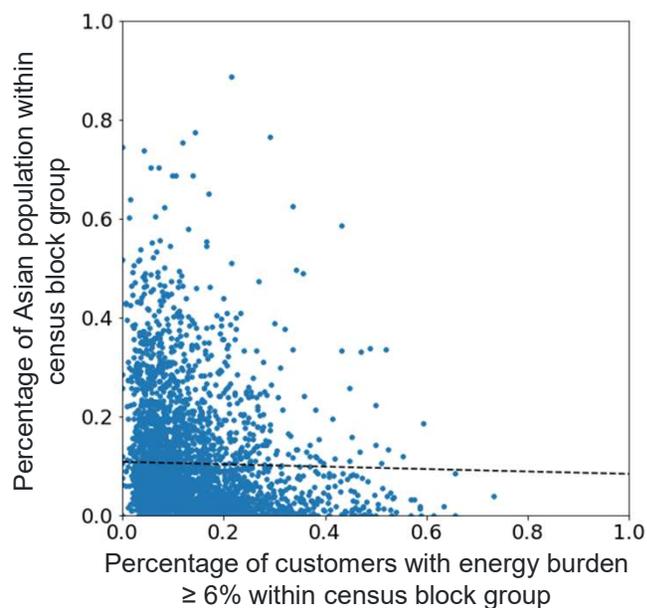


Customers in need of energy assistance are the estimated 13%, classified as both low-income and energy-burdened



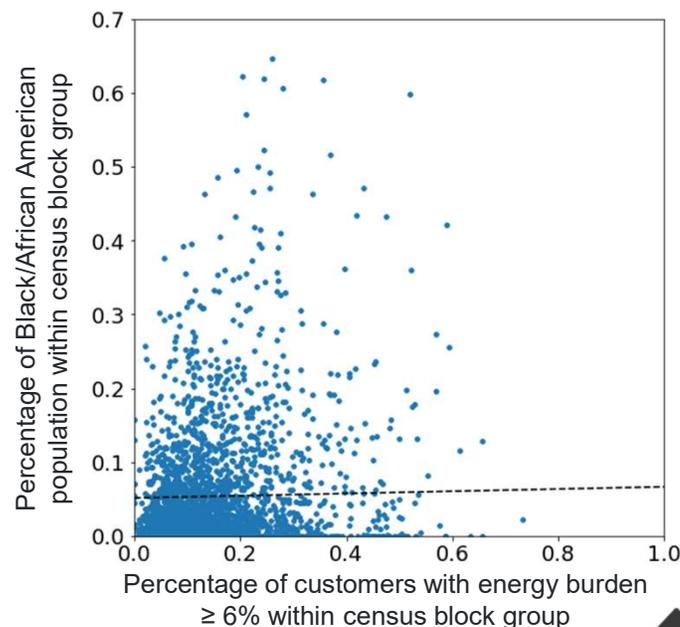
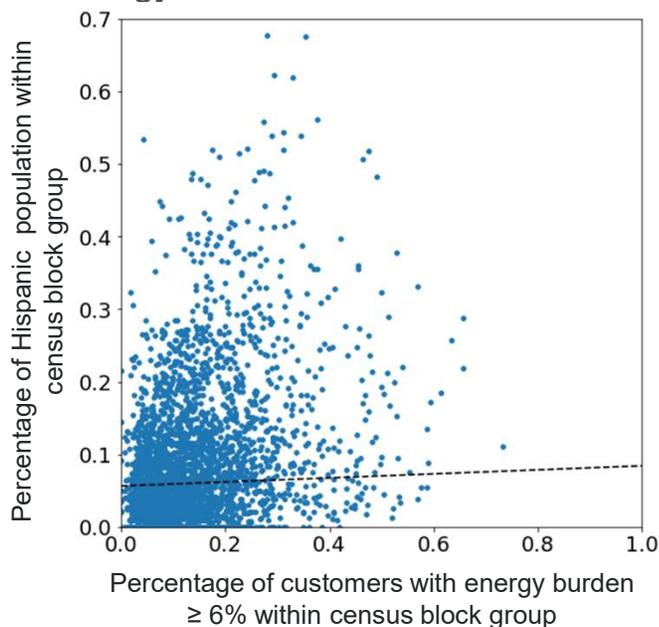
Energy Burden racial equity: Asian & White

- Across the census block groups in PSE's Service Area, higher percentages of **Asian or White** populations are associated with somewhat lower percentages of 6% or more energy burden.



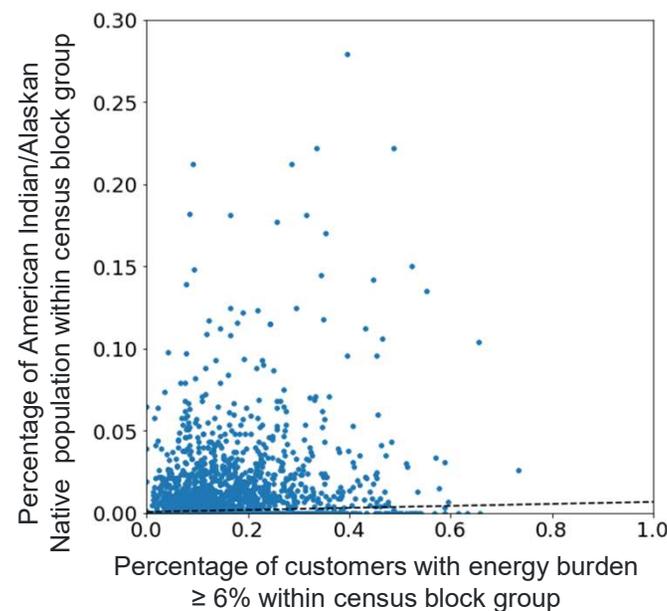
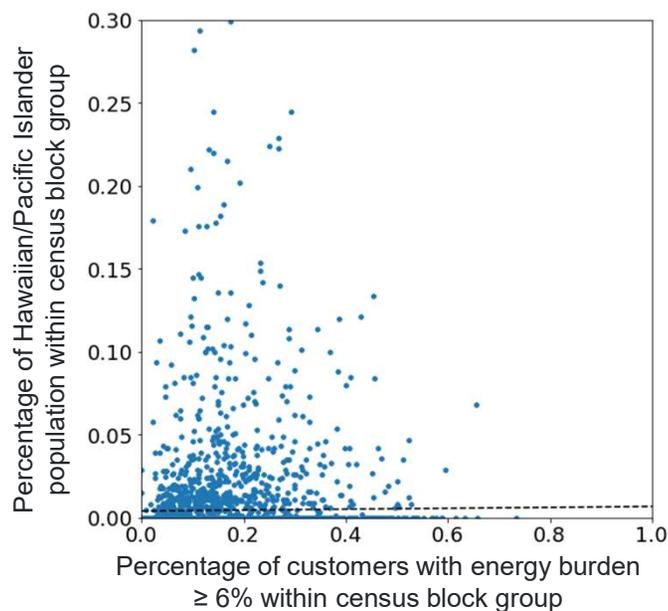
Energy Burden racial equity: Hispanic & Black/African American

- Across the census block groups in PSE’s Service Area, higher percentages of **Hispanic or Black/African American** populations are associated with somewhat higher percentages of 6% or more energy burden.

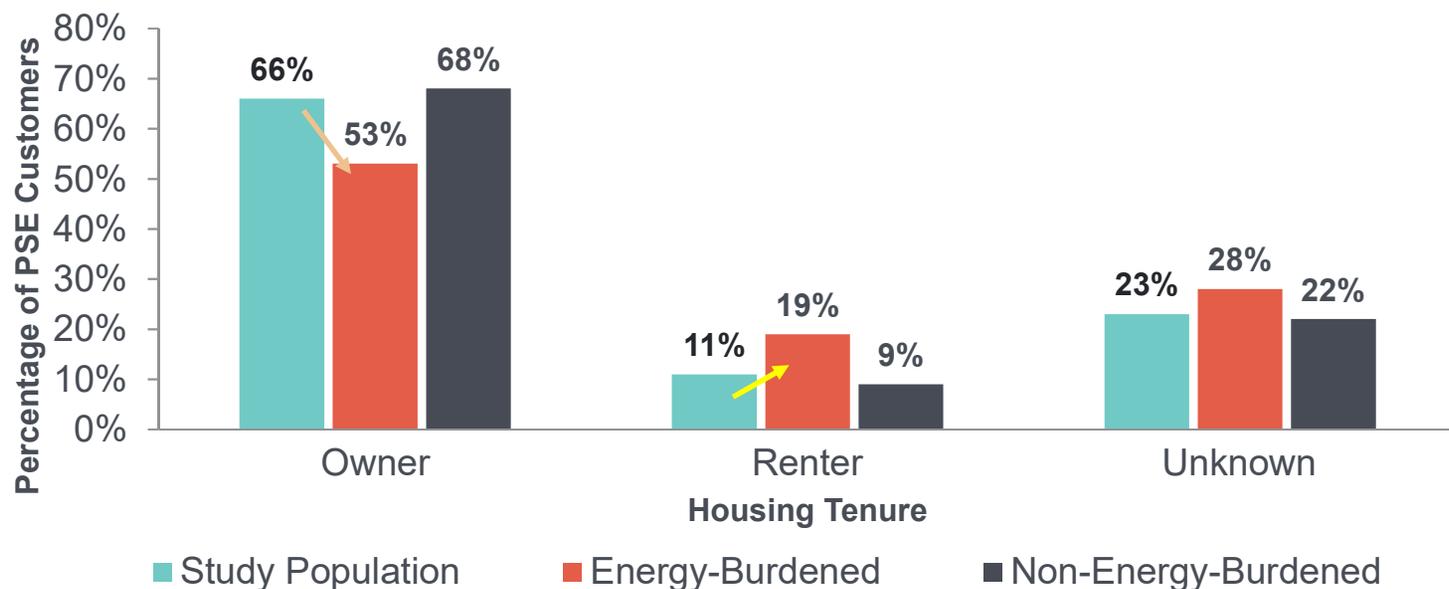


Energy Burden racial equity: Hawaiian/Pacific Islander & American Indian/Alaskan Native

- Across the census block groups in PSE's Service Area, higher percentages of **Hawaiian/Pacific Islander** or **American Indian/Alaskan Native** populations are associated with slightly higher percentages of 6% or more energy burden.

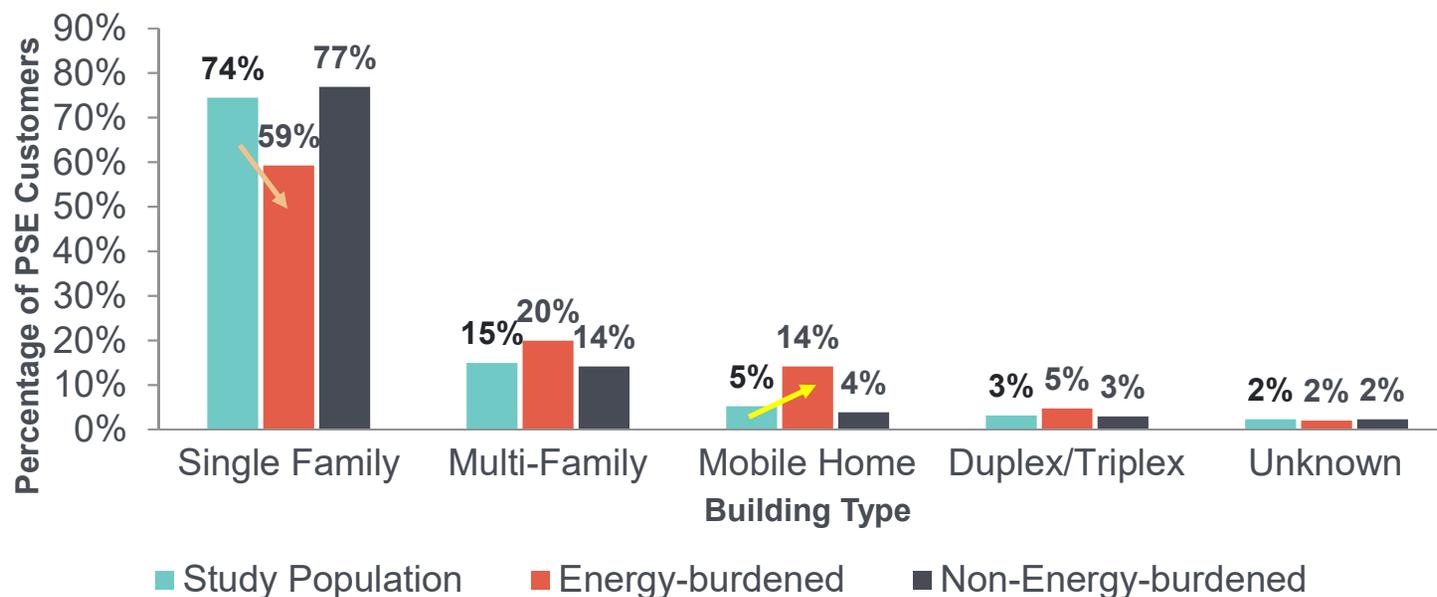


Energy Burden by housing tenure



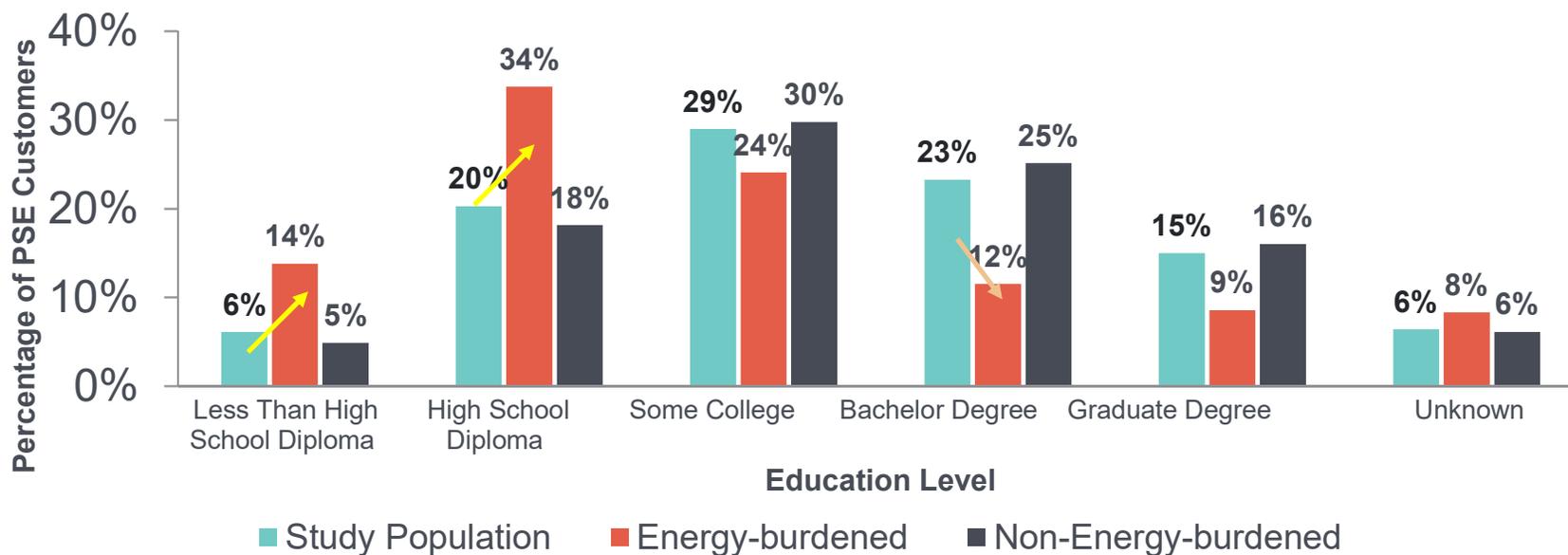
- Energy-burdened customers are more likely to be **renters** (make up 19% of energy-burdened population vs. 11% of total EBA study population)

Energy Burden by building type



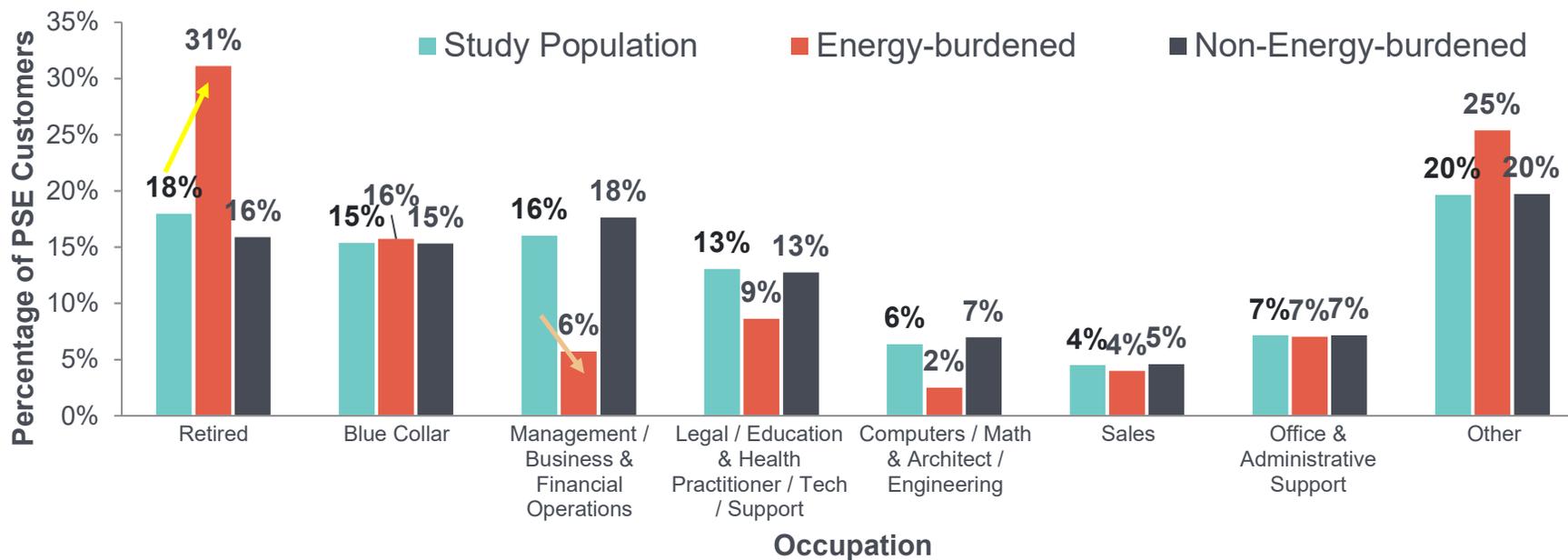
- Energy-burdened customers are more likely to live **in mobile housing** (14% of energy-burdened population vs. 5% of total EBA study population).

Energy Burden and educational attainment



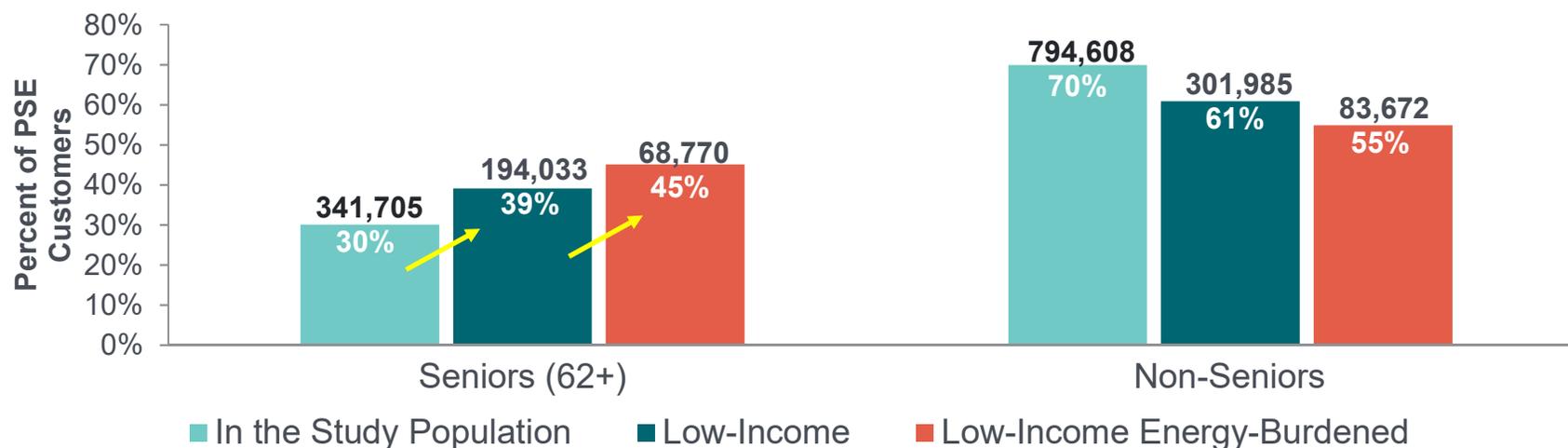
- Customers with high school or lower education make up 48% of energy-burdened customers versus 26% of the total EBA study population.

Energy Burden and occupation



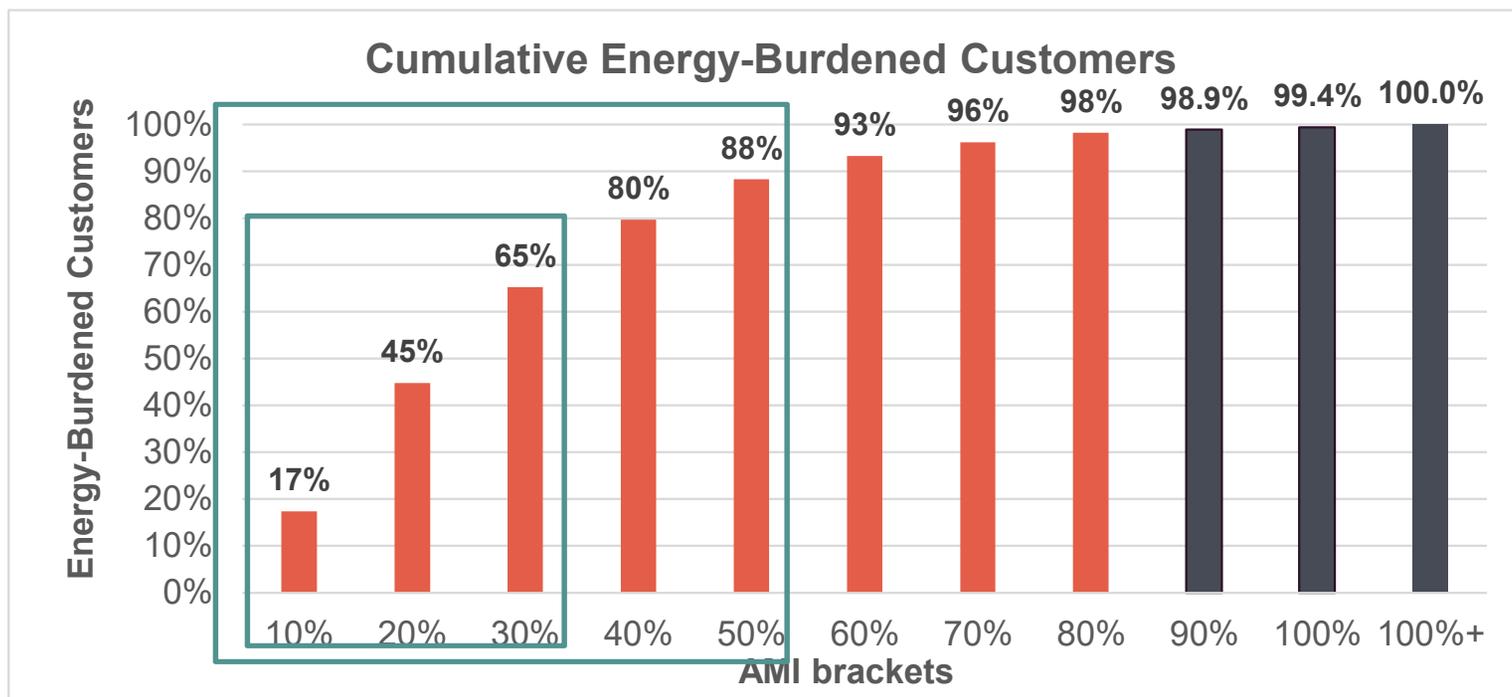
- Customers who are **retired**, and possibly on limited fixed-income, are more likely to be energy-burdened (retired customers make up 31% of energy-burdened customers vs. 18% of total EBA study population).

Energy Burden for Seniors (62+)

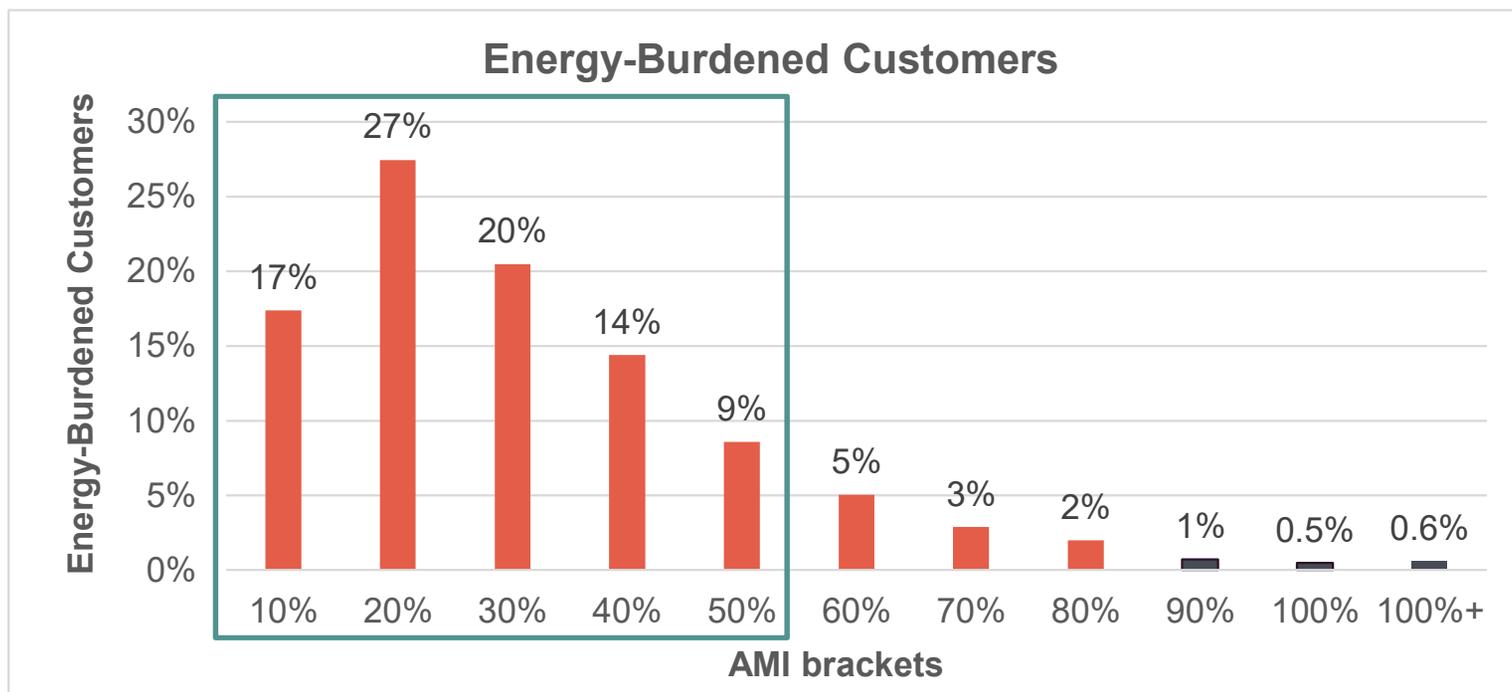


- Seniors (~**342K**) make up 30% of PSE’s total residential customers in the EBA; about 40% of the EBA study population classified as low-income, and **about a half (45%)** of the EBA study population classified as low-income and energy-burdened.
- Among Seniors:
 - 57% are classified as **low-income**.
 - 20% are classified as **low-income and energy-burdened**.

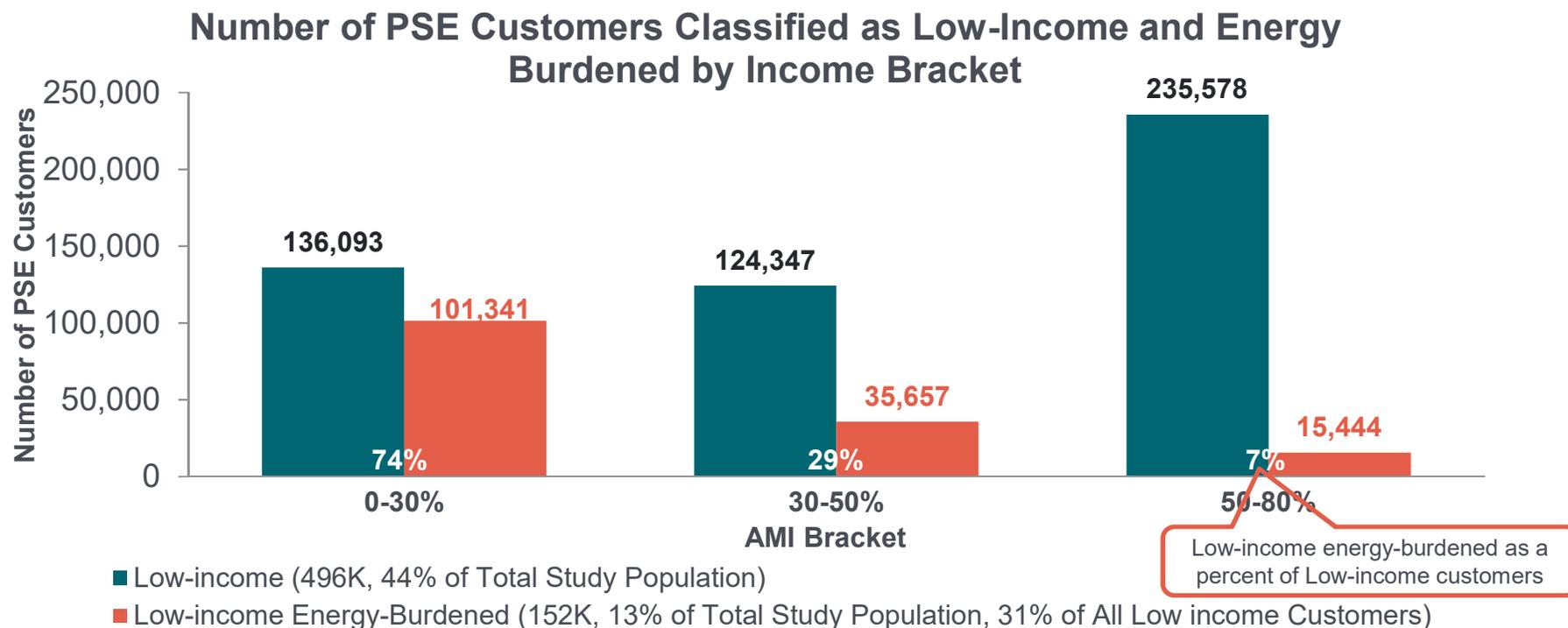
About 98% of all energy-burdened customers are classified as low-income, with 88% falling below 50% AMI, and 65% - below 30% AMI



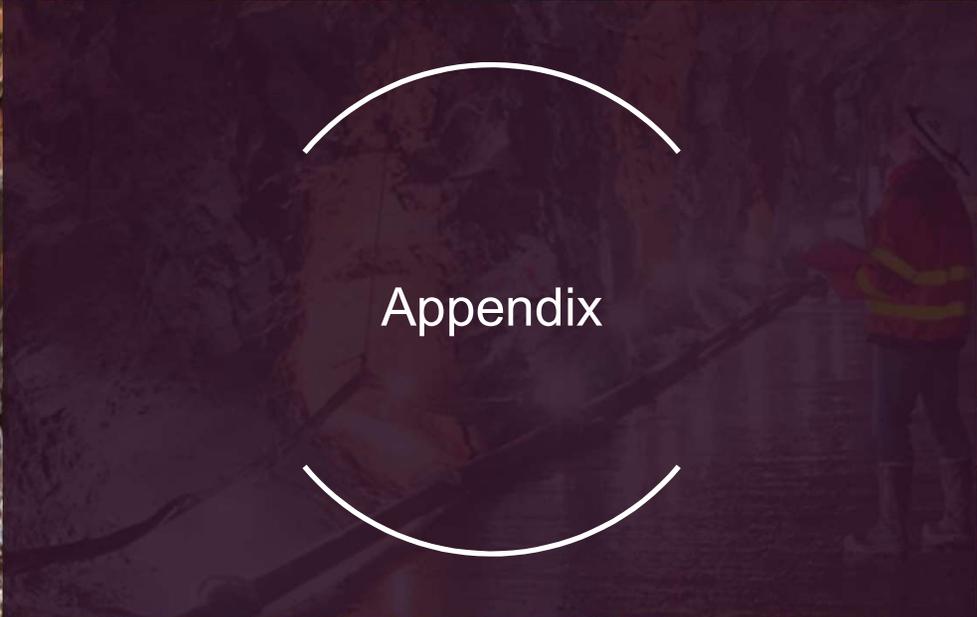
For the income brackets below 50% AMI, the proportion of energy-burdened customers is greatest (from 9% to 27%)



Nearly three quarters of customers in lowest AMI bracket (0-30% AMI) are energy-burdened, and nearly a third in 30-50% AMI group



*Note: Energy burden analysis includes roughly 80% of total customer base (based on 2020 10K) because of several data challenges

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Appendix

Table of Contents

- Appendix
 - Energy burden definitions
 - Data sources & additional methodology

Definitions in the Energy Burden Analysis:

Household (HH)

Residential PSE customer, identified by business partner ID

- Business partners (BP) with single customer account (CA) holders only

Low-income (LI)

HHs with annual income $\leq 80\%$ area median income (AMI)

- CETA: AMI $\leq 80\%$ or $\leq 200\%$ Federal Poverty Level (FPL), whichever is highest, adjusted for HH size

Energy Burden (EB)

Annual home energy expenses as a % of annual HH income

- **Energy-burdened:** Households with energy burden above 6% [CETA and Commerce]

PSE Energy Burden formula permutations:

- PSE's Combined Electric and Gas customers:
$$\text{Yearly } \frac{\text{PSE Electricity Bill} + \text{PSE Gas Bill} + \text{Other Heating Fuels Bill}}{\text{Income}}$$
- PSE's Electric Only customers:
$$\text{Yearly } \frac{\text{PSE Electricity Bill} + \text{Other Gas Bill} + \text{Other Heating Fuels Bill}}{\text{Income}}$$
- PSE's Gas Only customers:
$$\text{Yearly } \frac{\text{Other Electricity Bill} + \text{PSE Gas Bill} + \text{Other Heating Fuels Bill}}{\text{Income}}$$

Data sources

- **Income data**
 - Experian GT: Ground Truth Estimates from PSE Survey Data and Experian database
 - DOE/NREL LEAD Tool Data
- **Billed amounts**
 - DOE/NREL LEAD Tool data
 - PSE billing data
- **Demographic Information**
 - ACS 2019: ethnicity
 - Experian: own/rent, education, and profession
 - ATTOM: housing type and housing vintage (year built)
- **Geographic Information**
 - U.S. Census Jurisdictions: Census block groups aggregated to tracts
 - PSE Premise locations aggregated to block groups

The new definition of low-income: the higher of 80% Area Median Income or 200% Federal Poverty Level

Number of Persons in HH	King County	Snohomish County	Kitsap County	Pierce County	Thurston County	Whatcom County	Skagit County	Island County	Kittitas County	Lewis County
1	\$66,700	\$66,700	\$51,350	\$48,450	\$48,550	\$47,800	\$43,900	\$42,600	\$41,950	\$37,700
2	\$76,200	\$76,200	\$58,700	\$55,400	\$55,500	\$54,600	\$50,200	\$48,650	\$47,950	\$43,100
3	\$85,750	\$85,750	\$66,050	\$62,300	\$62,450	\$61,450	\$56,450	\$54,750	\$53,950	\$48,500
4	\$95,250	\$95,250	\$73,350	\$69,200	\$69,350	\$68,250	\$62,700	\$60,800	\$59,900	\$53,850
5	\$102,900	\$102,900	\$79,250	\$74,750	\$74,900	\$73,750	\$67,750	\$65,700	\$64,700	\$62,080
6	\$110,500	\$110,500	\$85,100	\$80,300	\$80,450	\$79,200	\$72,750	\$71,160	\$71,160	\$71,160
7	\$118,150	\$118,150	\$91,000	\$85,850	\$86,000	\$84,650	\$77,750	\$80,240	\$80,240	\$80,240
8	\$125,750	\$125,750	\$96,850	\$91,350	\$91,550	\$90,100	\$89,320	\$89,320	\$89,320	\$89,320
9	\$133,350	\$133,350	\$102,270	\$98,400	\$98,400	\$98,400	\$98,400	\$98,400	\$98,400	\$98,400
10	\$141,000	\$141,000	\$108,600	\$107,480	\$107,480	\$107,480	\$107,480	\$107,480	\$107,480	\$107,480
11	\$148,600	\$148,600	\$116,560	\$116,560	\$116,560	\$116,560	\$116,560	\$116,560	\$116,560	\$116,560
12	\$156,250	\$156,250	\$125,640	\$125,640	\$125,640	\$125,640	\$125,640	\$125,640	\$125,640	\$125,640
13	\$163,850	\$163,850	\$134,720	\$134,720	\$134,720	\$134,720	\$134,720	\$134,720	\$134,720	\$134,720
14	\$171,450	\$171,450	\$143,800	\$143,800	\$143,800	\$143,800	\$143,800	\$143,800	\$143,800	\$143,800
15	\$179,100	\$179,100	\$152,880	\$152,880	\$152,880	\$152,880	\$152,880	\$152,880	\$152,880	\$152,880
16	\$186,700	\$186,700	\$161,960	\$161,960	\$161,960	\$161,960	\$161,960	\$161,960	\$161,960	\$161,960
17	\$194,350	\$194,350	\$171,040	\$171,040	\$171,040	\$171,040	\$171,040	\$171,040	\$171,040	\$171,040
18	\$201,950	\$201,950	\$180,120	\$180,120	\$180,120	\$180,120	\$180,120	\$180,120	\$180,120	\$180,120
19	\$209,550	\$209,550	\$189,200	\$189,200	\$189,200	\$189,200	\$189,200	\$189,200	\$189,200	\$189,200
20	\$217,200	\$217,200	\$198,280	\$198,280	\$198,280	\$198,280	\$198,280	\$198,280	\$198,280	\$198,280
21	\$224,800	\$224,800	\$207,360	\$207,360	\$207,360	\$207,360	\$207,360	\$207,360	\$207,360	\$207,360
22	\$232,450	\$232,450	\$216,440	\$216,440	\$216,440	\$216,440	\$216,440	\$216,440	\$216,440	\$216,440
23	\$240,050	\$240,050	\$225,520	\$225,520	\$225,520	\$225,520	\$225,520	\$225,520	\$225,520	\$225,520
24	\$247,650	\$247,650	\$234,600	\$234,600	\$234,600	\$234,600	\$234,600	\$234,600	\$234,600	\$234,600

For households with less than 5 members, 80% AMI is greater than 200% FPL, across all counties in PSE's service territory.

80% AMI is the higher threshold
200% FPL is the higher threshold

