BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,
Complainant,
v.

PUGET SOUND ENERGY,
Respondent.

TENTH EXHIBIT (NONCONFIDENTIAL) TO THE
PREFILED DIRECT TESTIMONY OF

BIRUD D. JHAVERI

ON BEHALF OF PUGET SOUND ENERGY

JANUARY 31, 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.

- 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 Sources
Data Download and Cleaning
Data Matching of Various Datasets
Data Analysis

Data Analysis (Bills, Income, Demographic, and Geographic)

Definitions
Customer - Household
Low Income
Energy Assistance Need
Energy Burden

Methodology
4 methods using various data sources
3 Energy Burden calculations for Electric Only, Gas Only, and Combo Customers

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

1.136 MM Total Customer Base
(Energy Burden Analysis Study Population*)

- 496 K Low-Income (44%)
- 152 K (13%) Low-Income Energy-Burdened

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)

*Note: Energy Burden Analysis includes roughly 80% of total customer base (based on 2020 10K) because of several data challenges
As income increases, the proportion of energy-burdened customers decreases.

Number of PSE Customers Classified as Low-Income and Energy-Burdened by Income Bracket

- **Low-income (496K, 44% of Total Study Population)**
- **Low-income Energy-Burdened (152K, 13% of Total Study Population, 31% of All Low income Customers)**

*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%.
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:
  o 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.
  o 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:
  o Almost three quarters (74%) of all PSE customers in the lowest income bracket (Tier 1: <30% AMI group) are energy-burdened.
  o 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:
  
<table>
<thead>
<tr>
<th>6-10% Energy Burden</th>
<th>10%+ Energy Burden</th>
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</thead>
<tbody>
<tr>
<td>![Map of 6-10% Energy Burden]</td>
<td>![Map of 10%+ Energy Burden]</td>
</tr>
</tbody>
</table>
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

**EBA Study Population**

- Total number of customers: 1,136,313

**Customer = Household**

**PSE 2020 EBA**

*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 ≤80% area median income (AMI)

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

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

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

Energy-Burdened Customers

- Gas Only: 36,424 (23%)
- Electric Only: 94,167 (61%)
- Combo: 24,635 (16%)

Total: 155,226

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

- Combo: Low-income Energy-Burdened 98%
- Gas Only: Low-income Energy-Burdened 99%
- Electric Only: Low-income Energy-Burdened 98%
- Combo: Non-Low-income Energy-Burdened 2%
- Gas Only: Non-Low-income Energy-Burdened 1%
- Electric Only: Non-Low-income Energy-Burdened 2%
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 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

**Energy-Burdened Customers**

- **Total: 155,226**
  - About 14% of Total Number of Customers in the EBA

**Low-Income Energy-Burdened Customers**

- **Total: 152,442**
  - 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

- **Low-Income Energy-Burdened 98%**
  - Electric Only 92,197 (60%)
  - Gas Only 36,178 (24%)
  - Combo 24,067 (16%)

- **Non-Low-Income Energy-Burdened Customers**
  - Electric Only 92,197 (60%)
  - Gas Only 36,178 (24%)
  - Combo 24,067 (16%)

- **Total: 2,784**
  - Gas Only 246 (9%)
  - Combo 568 (20%)
  - Electric Only 1,970 (71%)
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.

![Graph showing relationship between percentage of Asian and White populations and energy burden.]

![Graph showing relationship between percentage of customers with energy burden ≥ 6% and census block group.]

PSE 2020 EBA
Exh. BDJ-11
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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 are energy-burdened as well.

Number of PSE Customers Classified as Low-Income and Energy Burdened by Income Bracket

<table>
<thead>
<tr>
<th>AMI Bracket</th>
<th>Number of PSE Customers</th>
<th>Number of PSE Customers Classified as Low-Income and Energy Burdened</th>
<th>Low-income energy-burdened as a percent of Low-income customers</th>
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</thead>
<tbody>
<tr>
<td>0-30%</td>
<td>136,093</td>
<td>101,341</td>
<td>74%</td>
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<tr>
<td>30-50%</td>
<td>124,347</td>
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<tr>
<td>50-80%</td>
<td>235,578</td>
<td>15,444</td>
<td>7%</td>
</tr>
</tbody>
</table>

*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
  - 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 ≤80% area median income (AMI)  
|                    | • CETA: AMI ≤80% or ≤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
  - AT TOM: 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

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<th>Island County</th>
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<th>Lewis County</th>
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For households with less than 5 members, 80% AMI is greater than 200% FPL, across all counties in PSE’s service territory.