EXH. BDJ-14
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____**

THIRTEENTH EXHIBIT (NONCONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY OF

BIRUD D. JHAVERI

ON BEHALF OF PUGET SOUND ENERGY

JANUARY 31, 2022

PSE's Residential Electric Block Study:
Assessing the impacts of changing the first residential energy block from 600 kWh to 800 kWh

I. Introduction

In Puget Sound Energy's ("PSE" or "Company") 2019 General Rate Case ("GRC") Final Order, the Washington State Utility Commission ("Commission") directed the Company to study the feasibility of expanding the first block energy rate from 600 kWh to 800 kWh, in consultation with the Low-Income Advisory Committee ("LIAC"), and report its findings in the Company's next GRC.[1] In order to comply with the Commission's directive, PSE conducted a detailed analysis and presents the methodology and findings in this document.

II. Methodology

This study assesses the impact of changing PSE's Electric Schedule 7 residential tariff's first energy block from 600 kWh to 800 kWh. Currently, these customers have two energy blocks, with the first block rate being lower than the second block rate. Therefore, the proposed reallocation is expected to help customers who use more than 600 kWh per month by reducing the charges for the usage between 600 kWh and 800 kWh.

A customer's bill consists of four parts: basic charge, electricity charge, energy exchange credit and other electric charges and credits. Out of these four components, the *electricity charge,* which includes the energy charge rates from Schedule 7, is the only component that varies between the energy blocks. The other charges are equal across energy blocks. Therefore, changes in the energy blocks will impact only the applicable energy charge rates. Accordingly, this analysis evaluates the effect of changing the energy blocks on total energy charges, holding all else equal. The following table shows the energy charge rates for the two residential blocks which are currently in effect[2] and the rates that would be effective under the proposal to increase the first block to 800 kWh. The reallocation of the energy blocks will change the rate applied to usage between 600 kWh to 800 kWh to the first block rate, decreasing the current rate by 22 percent. This study further analyzes the impact of this change on the aggregate annual energy revenues and on customers' monthly energy charges.

Table 1: Energy Block and Energy Charge Rates

Energy Block	Energy Block, kWh	Current Energy Charge Rate:	Proposed Energy Charge Rate:
Block 1	0- 600 kWh	**$0.093071**	**$0.093071**
Block 2	600 – 800 kWh	**$0.113277** →	**$0.093071**
Block 2	>800 kWh	**$0.113277**	**$0.113277**

[1] Docket UE-190529 (Puget Sound Energy 2019 GRC) Final Order 08 (July 8, 2020), at paragraph 545.
[2] This study uses the rates which became effective on October 15, 2020 to calculate impacts.

II.1 Customer Impact

In order to calculate the customer impact of expanding the first block energy rate, each customer's monthly energy charges are compared under the current rule and the proposed rule, both in dollar terms and in percentages. The monthly impacts are then averaged over the year to derive the average monthly impact. That is:

$$monthly\ customer\ impact\ \$ = (expected\ monthly\ energy\ charges - current\ monthly\ energy\ charges)$$

$$monthly\ customer\ impact\ \% = \frac{(expected\ monthly\ energy\ charges - current\ monthly\ energy\ charge)}{current\ monthly\ energy\ charges}$$

$$average\ monthly\ impact = \frac{\sum_{year} monthly\ impact(\$/\%)}{no\ of\ months}$$

For example, assuming a monthly usage of 852 kWh, the change in energy charge for that month would be:

$$Current\ Rule:\ 600\ \text{kWh} * \$0.093071 + 252\ \text{kWh} * \$0.113277 = \$84.39$$

$$Proposed\ Rule: 800\ \text{kWh} * \$0.093071 + 52\ \text{kWh} * \$0.113277 = \$80.35$$

$$\underline{Impact\ on\ the\ monthly\ charge}: \$80.35 - \$84.39 = \$(4.04) \text{or} (5)\%$$

For this example, under the proposed rule, the total monthly charge will decrease by $(4.04) or by (5)%. Each customer's monthly impacts are calculated in a similar fashion and then averaged over twelve months to get an average monthly impact.

II.2 Revenue Impact

For the annual impact on revenues, each customer's energy charges are aggregated for the whole year and then compared.

$$Revenue\ impact\ \$ = \sum_{customer,year} (expected\ annual\ energy\ charges - current\ annual\ energy\ charges)$$

$$Revenue\ impact\ \% = \sum_{customer,year} \frac{(expected\ annual\ energy\ charges - current\ annual\ energy\ charges)}{current\ annual\ energy\ charges}$$

II.3 Shortfall Allocation

Since the proposed allocation reduces the energy charges up to 200 kWh for customers using over 600 kWh, the expected outcome is a decrease in aggregate revenue. To recover this loss, PSE must redistribute the loss in revenues across the energy usage spectrum. This study analyzes three methods to maintain revenue neutrality in light of the revenue shortfall:

1. Shortfall Allocation Method 1 (SFA1): All shortfall is allocated to the newly defined residential first block (0-800 kWh).
2. Shortfall Allocation Method 2 (SFA2): All shortfall is allocated to the newly defined residential second block (>800 kWh).
3. Shortfall Allocation Method 3 (SFA3): The shortfall is equally allocated between the newly defined first block (0-800 kWh) and second block (>800 kWh).

The new rate or the energy charge under each shortfall allocation method will be calculated as follows:

$$Shortfall\ allocation\ block\ charge = \frac{Total\ Shortfall\ \$}{Total\ kWh\ in\ the\ allocation\ block}$$

III. Data

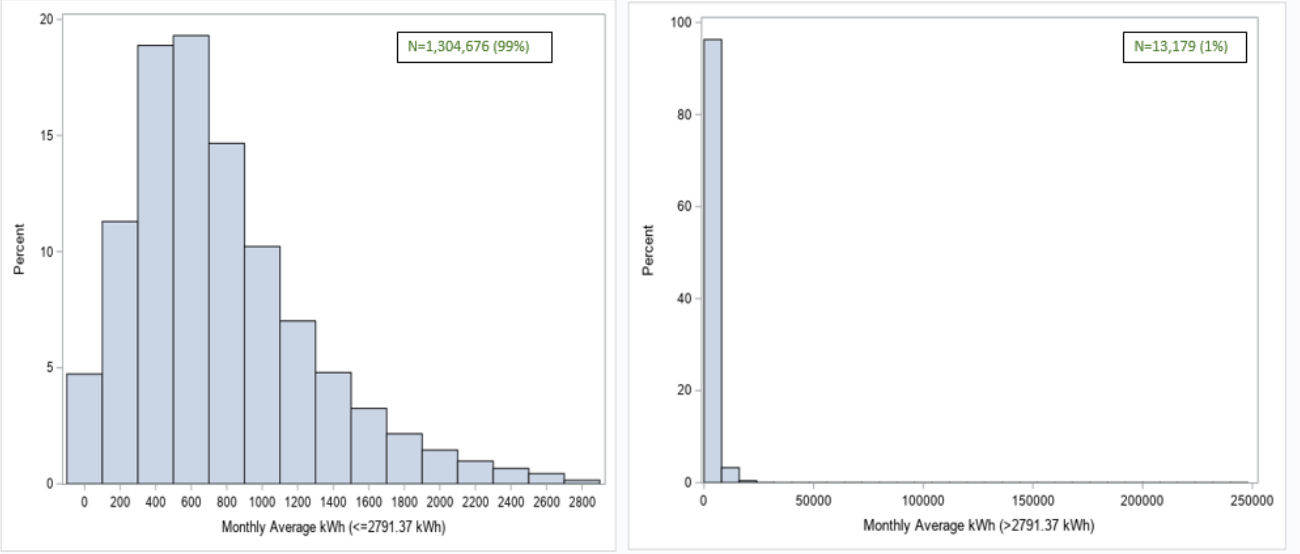
For this analysis, calendar year 2019 was used for monthly billed usage data, because it was devoid of COVID-19 impacts and usage trends. In 2019, there were approximately 1,317,855 residential customers who were active electric customers, at least partially through the year.[3] The table below provides the summary statistics of the average monthly billed energy use for all customers in this analysis. The table shows that customers on average use 790 kWh per month and have a median use of 658 kWh, which indicates fifty percent of all customers use 658 kWh on average or less. Twenty five percent of customers use between 658 kWh and 1,026 kWh on average, and another 24 percent use between 1,026 kWh and 2,791 kWh. Moreover, 1 percent of customer monthly average usage is more than 2,791 kWh. The data indicates a smaller number of customers' average monthly usage is significantly higher than the mean use, which is also demonstrated by the right skewed distribution of the monthly average usage (Figure 1). In order to better visualize the left side of the distribution, the total frequency distribution is truncated at 99 percent and shown in two parts. In other words, 99 percent of the distribution is shown in the left chart and the top 1 percent of the distribution is shown on the right chart.

[3] The customer count here represents the number of customer accounts. A single customer may have multiple accounts and hence actual customer count might be less than 1,317,855.

Table 2: Summary Statistics of the Average Monthly Billed Usage

Statistics	Population
N	1,317,855
StDev	661 kWh
Mean	**790 kWh**
Quartile 1	403 kWh
Median	**658 kWh**
Quartile 3	1,026 kWh
99%	**2,791 kWh**
Maximum	244,698 kWh

Figure 1: Frequency Distribution of Monthly Average kWh Usage



IV. Results

The proposed change in energy blocks is expected to either decrease customers' electricity charges or have no impact. Customers who use less than or equal to 600 kWh per month will be unaffected by the proposed change. It should be noted that a customer may use more than 600 kWh in some months and less in the other months. These customers will have a moderate monthly average impact, whereas customers using more than 600 kWh every month will have a relatively larger impact. Based on 2019 data, approximately 26 percent of customers will not experience any change in their average monthly energy charges. On the

other hand, 74 percent of customers will experience a decrease in their average monthly energy charges. Data shows customers will experience a $2.40 (or 2.15 percent) decrease in their average monthly energy charges. The total revenue deficiency from this change will equal approximately $24.1 million, or 2.23 percent.

Table 3: Overall Revenue Impact Summary

Number of Customers (% impacted)	Average Customer Impact, $	Average Customer Impact, Percentage	Revenue Deficiency, $ (Percentage)
970,031 (74%)	$(2.40)	(2.15)%	$24,088,127 (2.23%)

Since the proposed rule leads to a shortfall in revenues, it is necessary to evaluate alternative ways to recover this revenue loss. The remainder of this study focuses on three methods to recuperate the shortfall, which are discussed below.

IV.1 Shortfall Allocation Method 1

In SFA1, the total shortfall is allocated to the newly defined first block, or 0-800 kWh. This will lead to an increase in the first block's energy charge rate by a factor calculated as:

$$\frac{Total\ Shortfall}{Total\ usage\ \leq\ 800\ kWh}$$

In this scenario, the new energy charge rate for the first block will be: $0.0931 + $0.0033 = $0.0963.

As shown in Table 4, using SFA1, customers whose usage is less than or equal to 600 kWh will experience an increase in their charges; and customers whose usage is higher than 600 kWh may experience an increase (Example 1) or a decrease (Example 2) in their average monthly energy charges, depending on their monthly usage levels.

Example 1: Assuming monthly usage of 658 kWh:

$$\textbf{\textit{Current charges}}: 600\ kWh * \$0.0931 + 58\ kWh\ * \$0.1133;$$

$$\textbf{\textit{Expected charges}}: 658\ kWh * \$0.0963; \textbf{\textit{Impact}}: +2\%$$

Example 2. Assuming monthly usage of 790 kWh:

$$\textbf{\textit{Current charges}}: 600\ kWh * \$0.0931 + 190\ kWh * \$0.1133$$

$$\textbf{\textit{Expected charges}}: 790\ kWh * \$0.0963; \textbf{\textit{Impact}}: -2\%$$

Table 4: Energy Charge Rates under Shortfall Allocation Method 1

Block Definition	kWh Range	Current Rate	Shortfall Rate	% Change
Revised block 1	0-600 kWh	$0.0931	$0.0963	3.50%
Revised block 1	600-800 kWh	$0.1133	$0.0963	-15.00%
Revised block 2	>800 kWh	$0.1133	$0.1133	0%

IV.2 Shortfall Allocation Method 2

In SFA2, the total shortfall is allocated to the newly defined second block, where the increase in charge is calculated as:

$$\frac{Total\ Shortfall}{Total\ usage > 800\ kWh}$$

In this scenario, the new energy charge rate for the second block will be: $0.1133 + $0.0074 = $0.1207

Table 5 shows the energy charge rates for the energy blocks using SFA2. The change in blocks will impact customers using above 600 kWh and the increase in rates for the shortfall allocation will impact only those customers whose consumptions are above 800 kWh. For a customer with very high usage, this rate increase in the second block will outweigh the gain from shifting the blocks and, hence, again the combined effect from the two rules could be an increase (Example 1) or a decrease in energy charges (Example 2).

Example 1: Assuming monthly usage of 790 kWh:

$$\boldsymbol{Current\ charges}: 600\ kWh * \$0.0931\ kWh + 190 * \$0.1133;$$

$$\boldsymbol{Expected\ charges}: 790\ kWh * \$0.0931\ ; \boldsymbol{Impact}: -5\%$$

Example 2: Assuming monthly usage of 1,600 kWh:

$$\boldsymbol{Current\ charges}: 600\ kWh * \$0.0931 + 1{,}000\ kWh * \$0.1133;$$

$$\boldsymbol{Expected\ charges}: 800\ kWh * \$0.0931 + 800\ kWh * \$0.1207; \boldsymbol{Impact}: +1\%$$

Table 5: Energy Charge Rates under Shortfall Allocation Method 2

Block definition	kWh Range	Current Rate	Shortfall Rate	% Change
Revised block 1	0-600 kWh	$0.0931	$0.0931	0%
Revised block 1	600-800 kWh	$0.1133	$0.0931	-18%
Revised block 2	>800 kWh	$0.1133	$0.1207	7%

IV.3 Shortfall Allocation Method 3

In SFA3, total shortfall is equally distributed among the two revised blocks, where the increase in the first block energy charge rate is calculated as:

$$\frac{50\%\ of\ the\ Shortfall}{Total\ usage\ \leq\ 800\ kWh}$$

and the increase in the second block energy charge rate is calculated as:

$$\frac{50\%\ of\ the\ Shortfall}{Total\ usage\ >\ 800\ kWh}$$

In this scenario, the new rate for revised block 1 is: \$0.0931+ \$0.0016 = \$0.0947

And the new rate for revised block 2 is: \$0.1133 + \$0.0037 = \$0.1170

The expected impacts in this scenario will be in between SFA1 and SFA2. Every customer will be impacted by this allocation method. Some will experience a bill increase and others will experience a bill decrease. Example scenarios are presented below:

Example 1: Assuming monthly usage of 658 kWh:

$$\boldsymbol{Current\ charges}: 600\ kWh * \$0.0931 + 58\ kWh * \$0.0033;$$

$$\boldsymbol{Expected\ charge}: 658\ kWh * \$0.0947; \boldsymbol{Impact}: -0.02\%$$

Example 2. Assuming monthly usage of 1,600 kWh:

$$\boldsymbol{Current\ charges}: 800\ kWh * \$0.0931 + 800\ kWh * \$0.1133;$$

$$\boldsymbol{Expected\ charges}: 800\ kWh * \$0.0947 + 800\ kWh * \$0.1170; \boldsymbol{Impact}: +0.1\%$$

Table 6: Energy Charge Rates under Shortfall Allocation Method 3

Block Definition	kWh Range	Proposed Rate	Shortfall Rate	% Change
Revised block 1	0-600 kWh	\$0.0931	\$0.0947	2%
Revised block 1	600-800 kWh	\$0.1133	\$0.0947	-16%
Revised block 2	>800 kWh	\$0.1133	\$0.1170	3%

V. Combined Impact Assessment

As demonstrated in the earlier sections, the change in residential blocks will decrease the total energy charges of all customers using over 600 kWh; however, this will lead to an estimated annual revenue loss of $24.1 million. When the proposed rule is combined with a revenue shortfall allocation method, the impact on customers is not entirely straightforward because the shortfall allocations have a mixed impact on customers. The change not only impacts every customer differently, but it can affect the same customer differently across months. Meaning, a customer's total energy charges may increase in some months and decrease in other months due to their varying usage levels throughout the year. Table 7 shows the overall annual impact summary from the proposed reallocation of the energy block and from the alternative shortfall allocation methods:

Table 7: Annual Average Impacts from Alternative Rules

Proposed Changes	Total Shortfall	Percentage of Customers Impacted	Average Customer Impact, $	Average Customer Impact, Percentage
0-800 kWh @ $0.0931	($24,088,127)	74%	$(2.40)	(2.15)%
0-800 kWh @ $0.0963	Shortfall allocated to block 1 (SFA1)	100%	$0.04	1.37%
> 800 kWh @ $0.1207	Shortfall allocated to block 2 (SFA2)	74%	$(0.02)	(0.93)%
0-800 kWh @ $0.0947 > 800 kWh @ $0.1170	Shortfall distributed equally between both blocks (SFA3)	100%	$0.01	0.34%

At a high-level, the assessment reveals the proposed energy block change will impact approximately 74 percent of all customers with an average decrease to monthly energy charges of about $2.40 or 2.15 percent. However, adopting additional measures to recuperate the revenue shortfall of approximately $24.1 million will eliminate some or all of the energy charge reductions arising from the change in the energy block allocation. These measures will impact some customers favorably and some adversely. SFA1 and SFA3 affect the first block and hence will impact all customers. SFA1's overall average impact is an increase of $0.04 or 1.37 percent to average energy charges. SFA3 will have a more moderate increase to monthly energy charges of $0.01 or 0.34 percent. On the other hand, SFA2 only impacts usage over 600 kWh, hence it impacts approximately 74 percent of the customers. The overall impact is a decrease to average energy charges of $0.02 or 0.93 percent. Again, since the allocation methods have both positive and negative effects based on customers' usage levels, the overall average effect does not reveal the true impact. Therefore, in the next section, impacts are reviewed by the direction of the change. In addition, to understand the extent of the effects, the impacts are shown in dollars instead of percentage terms.

Table 8: Annual Average Impacts from Alternative Rules by Direction of Change

Allocation Type	Directions of Impacts	Percentage of Customers Impacted	Average Monthly Impact Summary, $			
			Mean	Median	P95	(Min)/Max
Short Fall Allocation 1 (SFA 1)	Energy Charge Decrease	44%	$(0.94)	$(1.08)	$(1.44)	$(1.44)
	Energy Charge Increase	56%	$0.80	$0.82	$1.54	$1.95
Short Fall Allocation 2 (SFA 2)	Energy Charge Decrease	55%	$(1.20)	$(1.06)	$(2.84)	$(4.04)
	Energy Charge Increase	18%	$3.60	$2.07	$11.31	$1,800.56
	No change	26%	-	-	-	-
Short Fall Allocation 3 (SFA 3)	Energy Charge Decrease	46%	$(0.87)	$(0.73)	$(2.05)	$(2.74)
	Energy Charge Increase	54%	$0.76	$0.48	$2.59	$899.44

Table 8 shows SFA1 will decrease the monthly average charges for approximately 44 percent of customers. The decrease in average monthly energy charges is less than $1.00 and the maximum decrease to monthly energy charges is $1.44. On the other hand, about 56 percent will experience an increase in average monthly charges, with the average monthly increase being less than $1.00 and the maximum increase to monthly energy charges being less than $2.00.

SFA2 will decrease the average annual charges for about 55 percent of customers. The average monthly savings, or decrease to energy charges, will be $1.20, with a maximum monthly decrease to energy charges of $4.04. Approximately 18 percent of customers will experience an increase in average monthly charges of about $3.60. Of these customers, about 5 percent will experience a monthly increase in energy charges of over $11 to $1,800. Approximately 26 percent of customers will not be affected by SFA2.

SFA3, on the other hand, will have a moderate impact, which is in between the above two allocation methods. About 46 percent of customers will experience a decline in monthly energy charges of less than $1.00 with a maximum monthly decline of $2.74. However, 54 percent of customers will experience an increase in average monthly energy charges. The average monthly increase is less than $1.00, and customers with high usage may experience monthly increases over $2.59.

This analysis shows that the proposed change in energy blocks have varied impacts on customers. Under the proposed change some customers are likely to be adversely impacted, with substantial bill impacts, depending on the choice of the shortfall allocation method. SFA1 affects every customer, but the overall impact is marginal. SFA2 affects fewer customers, but the impact is more pronounced on some customers. SFA3, again, impacts all customers, and the overall impact is more than SFA1 but less pronounced than SFA2. SFA2 and SFA3 are likely to have a disproportionate impact on customers with higher than average usage levels.

VI. Impact Assessment by Customer Type

Because the shortfall allocations have mixed results and certain customers are likely to be adversely impacted, with potentially high bill impacts, it is important to understand which customers will likely experience the higher impacts on their energy charges. Table 9 displays the average monthly usage for electric customers by the following customer type:

- Full study population
- Non-low-income customers only (customers with income levels above 80 percent area median income (AMI))
- Low-income customers only (customers with income levels below 80 percent AMI)
- PSE HELP (Home Energy Lifeline Program) customers
- Energy-burdened low-income customers only (low-income customers with energy burden above 6 percent)[4]

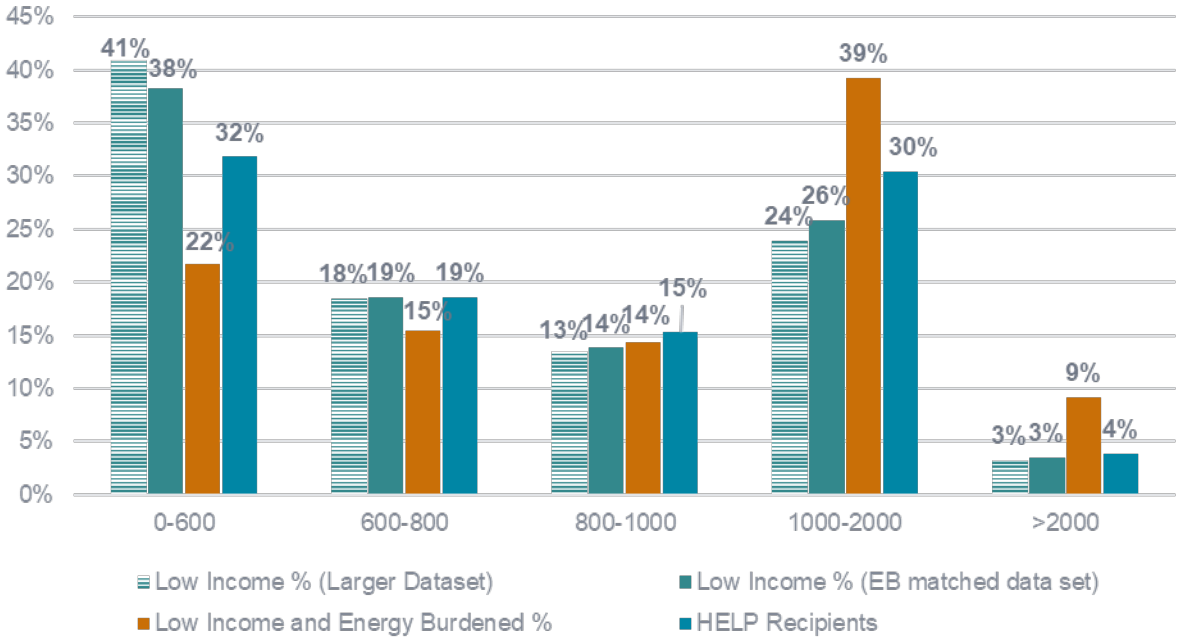
Table 9: Summary Statistics of Average Monthly Usage by Customer Type

Statistics	Population	Low-Income	Non-Low-Income	PSE HELP	Low-Income Energy-Burdened
N	1,317,855	468,434	590,810	25,807	97,752
StDev	661 kWh	563 kWh	646 kWh	535 kWh	719 kWh
Mean	**790 kWh**	**813 kWh**	**881 kWh**	**907 kWh**	**1,117 kWh**
Q1	403 kWh	452 kWh	478 kWh	532 kWh	643 kWh
Median	**658 kWh**	**692 kWh**	**729 kWh**	**802 kWh**	**978 kWh**
Q3	1,026 kWh	1041 kWh	1192 kWh	1165 kWh	1,426 kWh
99%	2,791 kWh	2,604 kWh	2,996 kWh	2,617 kWh	3,335 kWh
Maximum	244,698 kWh	31,618 kWh	67,193 kWh	7,923 kWh	31,618 kWh

[4] As defined by the Washington Department of Commerce, the definition of an “energy-burdened” customer is a customer whose energy burden is at or greater than 6 percent. Per Washington State’s 2019 Clean Energy Transformation Act (CETA), "energy burden" means the share of annual household income used to pay annual home energy bills (electricity, natural gas, propane, heating oil, wood, etc.).

As stated earlier, PSE estimates that the total study population has an average use of 790 kWh per month and a median use of 658 kWh, which indicates fifty percent of all customers use 658 kWh on average, or less. However, as PSE disaggregates the data and categorizes customers based on income levels as well as energy burden, it becomes evident that the mean use, as well as the median use, rises. While low-income customers appear to have usage levels below non-low-income customers, summary statistics of PSE HELP customers and low-income energy-burdened customers suggest certain low-income customers have much higher usage levels than non-low-income customers. Additionally, 25 percent of low-income energy-burdened customers use more than 1,426 kWh per month on average; that is more than double the average use of the population median (658 kWh). Figure 2 below shows the distribution of low-income customer types across various usage levels.[5]

Figure 2: Low-Income Customer Type by Monthly Average Use



While a majority of PSE's non-low income customers' average monthly use is below 800 kWh, the chart above shows nearly 50 percent of PSE HELP recipients tend to use 800 kWh or more on average. Further, nearly 50 percent of low-income energy-burdened customers tend to consume more than 1,000 kWh on average. Additionally, 9 percent of low-income energy-burdened customers use more than 2,000 kWh on average, compared to 3-4 percent of all low-income customers and PSE HELP recipients. This indicates

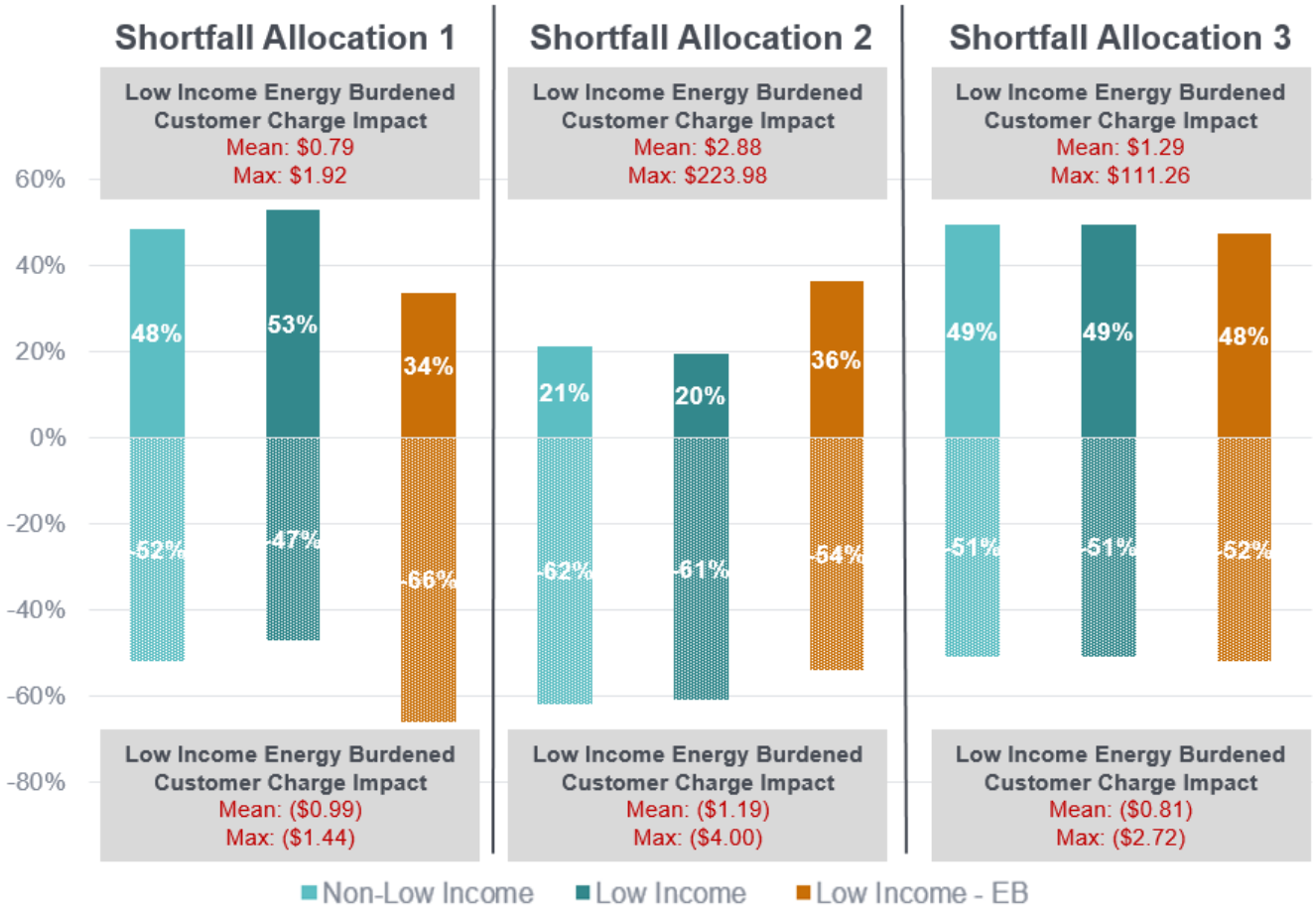
[5] "Low Income (Larger Dataset)" indicates data from this study that matches PSE's enhanced Experian dataset. "Low Income and Energy Burdened" indicates data from PSE's 2019 Energy Burden Analysis dataset and "Low Income (Energy Burden (EB) dataset)" indicates data from this Electric Block study that is matched with the 2019 Energy Burden Analysis dataset. Although both Electric Block and Energy Burden studies use the 2019 residential population, a perfect match could not be achieved because of the use of different data sources, analytical assumptions, and their interdependences with other data sources. Therefore, both results are provided here for comparison.

that there are two distinct categories of low-income customers: 1) low-use low-income customers, and 2) high-use low-income customers. If PSE removes low-income energy-burdened customers from the low-income population, the mean and median of the low-income population summary statistics falls below the population average, indicating low-use low-income customers consume less than the study population on average. This category of low-income customers is distinct from the low-income customers who typically have higher use and, therefore, higher energy burden.

VII. Conclusion

The analysis reveals that all three SFA methods will produce winners and losers. As can be seen in Figure 3 below, on average SFA1 will increase the energy charges for low-income energy-burdened customers by less than $0.80 but no more than $1.92. In fact, customers with higher usage levels will experience an overall decrease in energy charges as the increase in rates in the first block is overcome by the discount in use between 600 kWh to 800 kWh. This method will have the most equitable distribution of the shortfall across customers because all customers have usage between 0 kWh and 800 kWh.

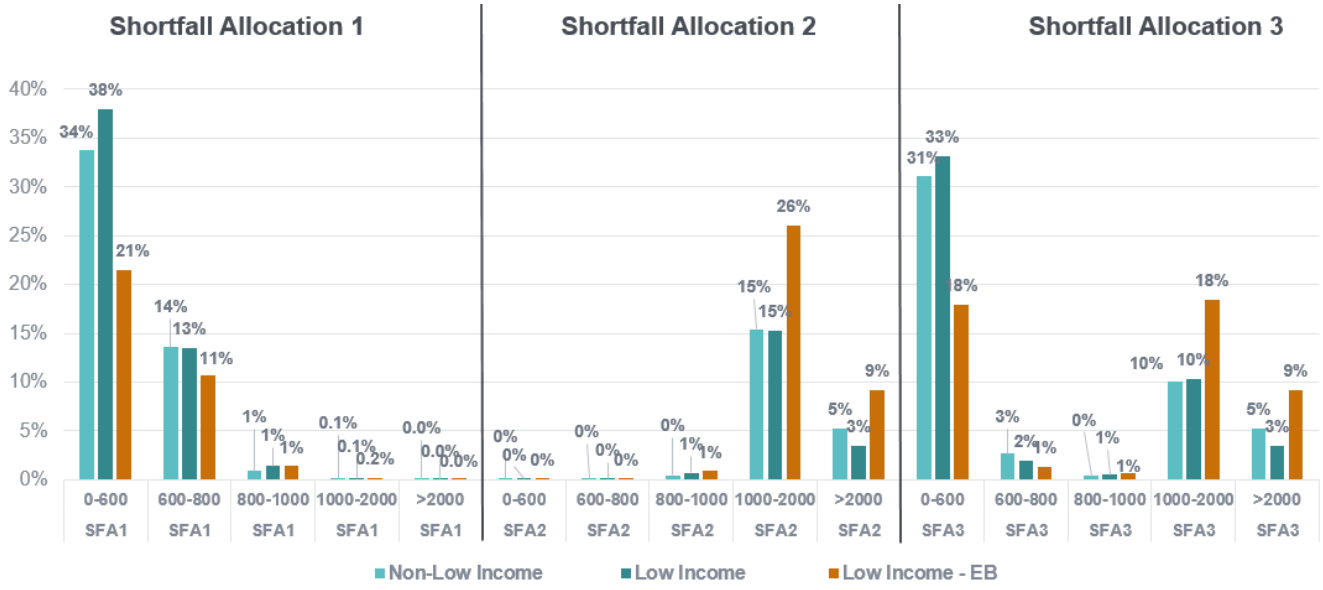
Figure 3: Impact Overview for Customers with Income and Energy Burden data



SFA2 will not impact customers whose monthly usage is below 600 kWh. Low-income energy-burdened customers using 600 kWh to 800 kWh in fact will receive a decrease in energy charges by $1.19 on average, up to $4.00. However, for the low-income energy-burdened customers who will experience a monthly increase, the energy charges will go up from $2.88 to over $200.00. Like SFA1, SFA3 will impact all customers because the shortfall is allocated equally to the first block and the second block. Customers whose use averages between 600 kWh to 800 kWh will benefit, but higher-usage customers again will face larger energy charge increases, but less pronounced than in SFA2.

Expanding the first energy block to 800 kWh will have unintended consequences. As shown in Figure 3 above and Figure 4 below, the impacts from the proposed change are quite similar across non-low-income and low-income customers. The consequences, or increases in energy charges, will be more pronounced for low-income energy-burdened customers as a group due to their higher usage.

Figure 4: Expected Customer Impact Increase by Customer Type



The shortfall allocation methods, along with the increase in kilowatt-hour threshold for the first block, will have varied impact for all customers. While some will benefit, the savings to these customers' energy charges may not be significant – a maximum of a $4 decrease per bill. However, for those customers who will experience an increase in energy charges, the impacts may be considerable – up to $224 per month. Since 63 percent of low-income energy-burdened customers use more than 800 kWh on average per month, some of these customers could experience a substantial bill increase with SFA2 and SFA3, especially during winter months when usage spikes above average use.

APPENDIX

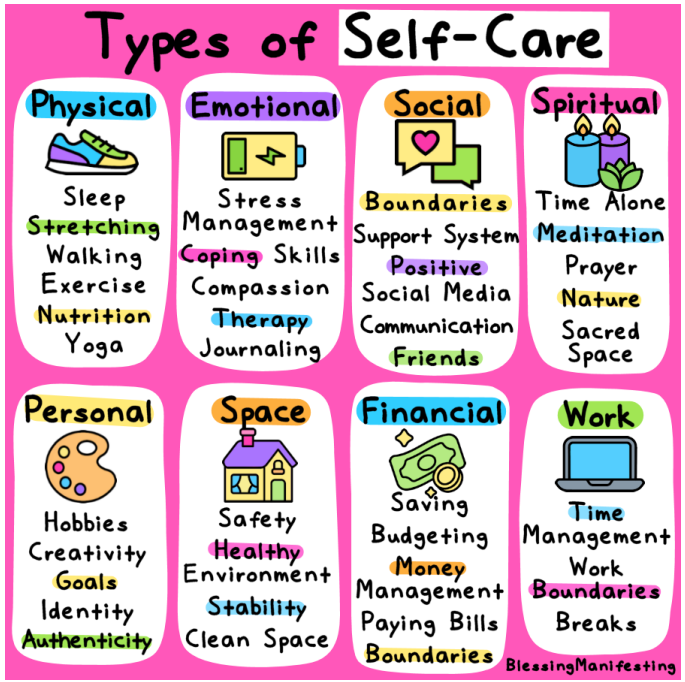
Assessing the Impact of Increasing PSE's Residential Energy Block

Presentation to Low Income Advisory Committee (LIAC)

November 22, 2021

PUGET SOUND ENERGY

Self-Care: **Treat Yo'Self**



Keeps you **healthy**, helps you **recharge**, and helps **improve overall well being**

Survey of 2279 STEM Ph.D. candidates across 26 countries **40% reported high levels of anxiety and depression**

Survey of general population with **anxiety** and/or **depression***
Ages 18-24: 56.2%
Ages 25-49: 48.9%
Ages 50-64: 39.1%
Ages 65+ 29.3%

* Kaiser Family Foundation

Prioritize self-care:
- Add it to your **daily calendar**
- Do it when you have a **free moment**
- Make it a **habit**

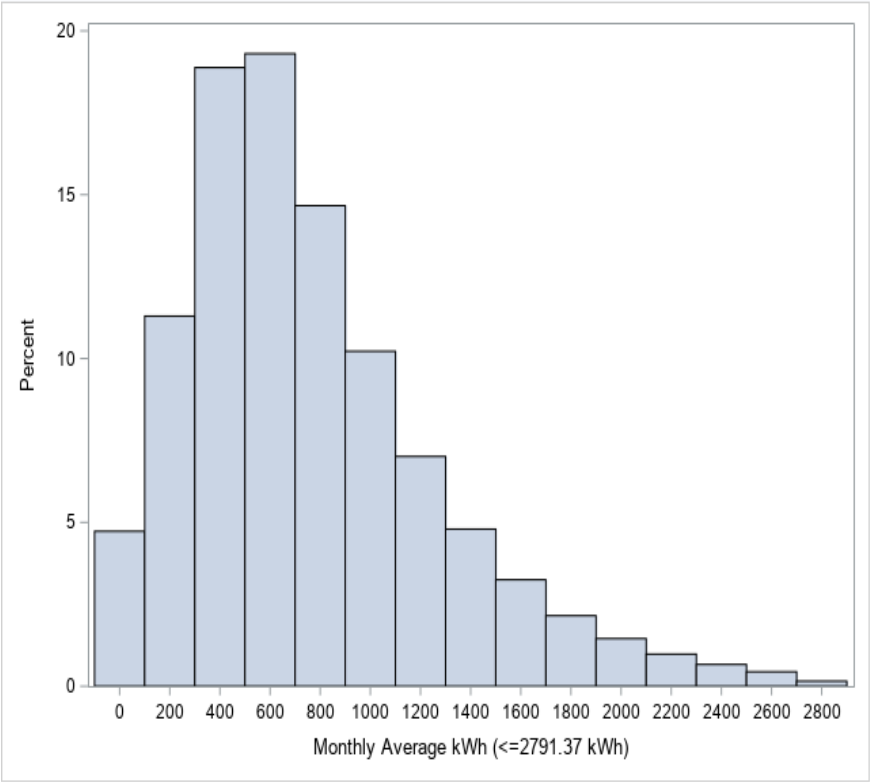
PUGET SOUND ENERGY

Background, Methodology & Data

- In the Company's 2019 GRC Order, the Commission directed PSE, in consultation with the LIAC, to study the feasibility of expanding the first block energy rate from 600 kWh to 800 kWh and report its findings in the Company's next GRC
- Currently, there are two blocks for PSE's residential energy charge
    - First Block Rate per kWh for the first 600 kWh
    - Second Block Rate per kWh for all over 600 kWh
- The impact analysis is conducted by comparing each customers' monthly charges under the current tariff to the proposed residential block change
    - The **study examines only the impact on changing the energy charges**, which vary with energy usage, and excludes the Basic Charge and other charges/credits that remain static between blocks
- The analysis is conducted using customers' usage data for 2019, as 2020 was an anomalous year

PUGET SOUND ENERGY

Distribution of the Average Residential Monthly Usage (truncated at 99%)



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Q3	1,026 kWh
99%	**2,791 kWh**
Maximum	244,698 kWh

PSE PUGET SOUND ENERGY

Energy Blocks and Impact Calculation

- Feasibility Study: Increase the current Residential Block 1 limit from 600 kWh to 800 kWh
- Monthly energy charge for each customer is calculated as:
  - (**First** Block Usage * **First** Block Rate) **+** (**Second** Block Usage * **Second** Block Rate)

Blocks under **current tariff ***

Energy Block	Energy Block kWh	Energy Charge*
Block 1	0 – 600 kWh	$0.093071
Block 2	600 – 800 kWh	**$0.113277**
Block 2	>800 kWh	$0.113277

Blocks under **feasibility study**

Energy Block	Energy Block kWh	Energy Charge*
Block 1	0 – 600 kWh	$0.093071
Block 1	600 – 800 kWh	**$0.093071**
Block 2	>800 kWh	$0.113277

* Rates used for analysis are effective as of October 15, 2020

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Increasing the first energy block to 800 kWh produces a $24.1M shortfall

- Proposed change will lead to a decrease in monthly bills for every customer using over 600 kWh and produce an annual revenue shortfall of $24.1 Million

Number of Customer (% impacted)	Total Energy Charge Revenue (Current Tariff)	Total Energy Charge Revenue (Feasibility Study)	Revenue Impact $ / %
970,031 (74%)	$1,082,076,685	$1,057,988,559	$24,088,127 (-2.23%)

* Total Energy Charge Revenue is calculated monthly for each customer account and then aggregated

- In order to maintain revenue neutrality, the annual shortfall must be allocated back to customers through a rate adjustment

PSE PUGET SOUND ENERGY

Multiple Revenue Shortfall Allocation (SFA) methods to recover the shortfall were tested

- There are multiple methods to recover the revenue shortfall. Three alternative methods assessed in the study include:

1. SFA1 – All shortfall is assigned to Revised Block 1 (0-800 kWh)
2. SFA2 – All shortfall is assigned to Revised Block 2 (>800 kWh)
3. SFA3 – 50% of the shortfall is allocated to Revised Block 1 (0-800 kWh) and 50% to Revised Block 2 (>800 kWh)

PUGET SOUND ENERGY

SFA Method 1 (SFA1): All shortfall allocated to Block 1

Block Definition	kWh Range	Current Rate	Shortfall Rate	% Change
Block 1	0-600 kWh	$0.0931	**$0.0963**	3%
Revised Block 1	600-800 kWh	$0.1133	**$0.0963**	-15%
Revised Block 2	>800 kWh	$0.1133	$0.1133	0%

Increase in Block 1 rate is calculated as : $\frac{total\ shortfall}{total\ kwh \leq 800 kwh}$

Shortfall Rate: $0.0931 + $0.0033 = **$0.0963**

PUGET SOUND ENERGY

SFA Method 2 (SFA2): All shortfall allocated to Block 2

Block Definition	kWh Range	Current Rate	Shortfall Rate	% Change
Block 1	0-600 kWh	$0.0931	$0.0931	0%
Revised Block 1	600-800 kWh	$0.1133	**$0.0931**	-18%
Revised Block 2	>800 kWh	$0.1133	**$0.1207**	7%

Increase in Block 2 rate is calculated as :

$$\frac{total\ shortfall}{total\ kwh{>}800kwh}$$

Shortfall Rate: $0.1133 + $0.0074 = **$0.1207**

PUGET SOUND ENERGY

SFA Method 3 (SFA3): Shortfall is equally allocated to both blocks

Block Definition	kWh Range	Current Rate	Shortfall Rate	% Change
Revised Block 1	0-600 kWh	$0.0931	**$0.0947**	2%
Revised Block 1	600-800 kWh	$0.1133	**$0.0947**	-16%
Revised Block 2	>800 kWh	$0.1133	**$0.1170**	3%

Increase in Block 1 is calculated as : $\frac{50\%\ of\ the\ shortfall}{total\ kwh \leq 800kwh}$ and for Block 2 as : $\frac{50\%\ of\ the\ shortfall}{total\ kwh > 800kwh}$

Shortfall Rate for Block 1: $0.0931 + $0.0016 = $0.0947 and for Block 2: $0.1133 + $0.0037 = $0.1170

PSE PUGET SOUND ENERGY

Energy Charge Impact Result Highlights: Shortfall allocations have mixed impact

- Shortfall allocations have mixed impact. These methods not only impact every customer differently, they can also impact the same customer differently across months

- Because of these reasons, impacts are analyzed by the average dollar amount and by the direction of impact (i.e. whether the annual average bill impact is an increase (a rise in energy charges) or a decrease (a fall in energy charges))

- The impacts are further analyzed by customer type:
  - All customers
  - HELP assistance recipients
  - Low Income customers
  - Low Income Energy Burdened customers

PUGET SOUND ENERGY

Summary of Average Monthly Energy Charge Impact – All Customers

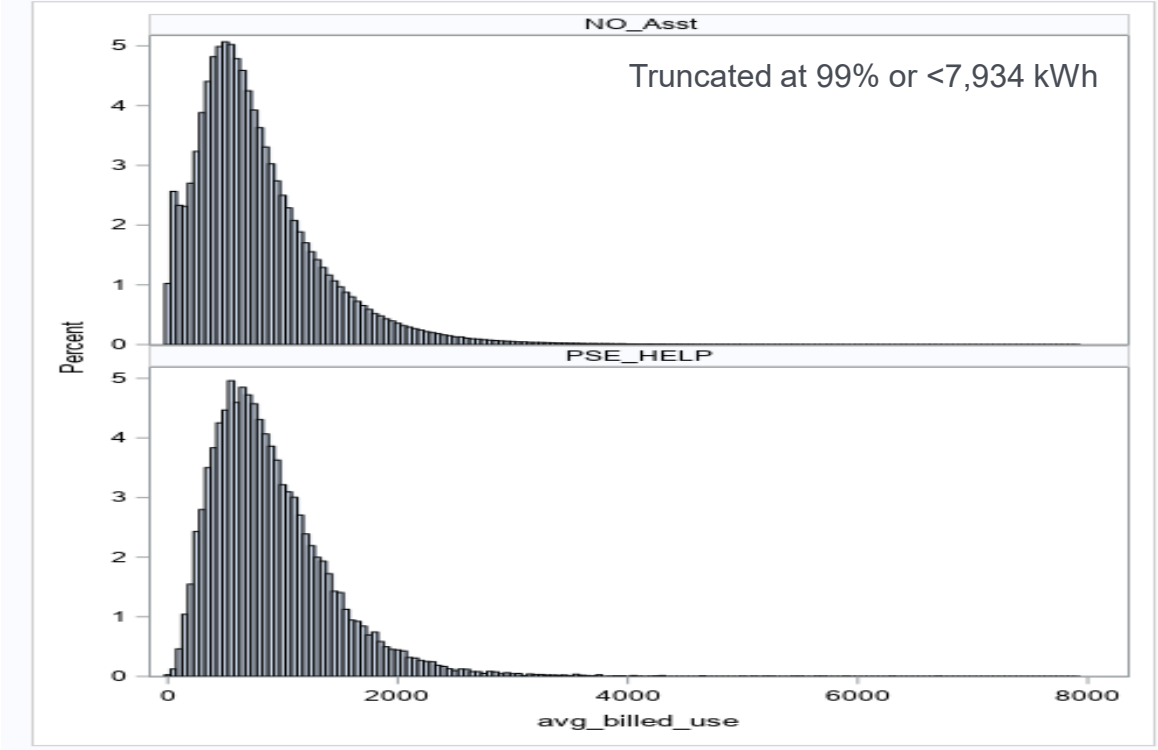
Revenue Shortfall Allocation	Energy Charge Block 1 (</=800 kWh) Block 2 (>800 kWh)	Direction of impact	Average Annual Customer Impact	Monthly Impact Summary ($)			
				Mean	Median	P95	Min/Max
SFA1	Block 1: $0.0963 Block 2: $0.1133	Bill decrease	44%	$(0.94)	$(1.08)	$(1.44)	$(1.44)
		Bill increase	56%	$0.80	$0.82	$1.54	$1.95
SFA2	Block 1: $0.0931 Block 2: $0.1207	Bill decrease	55%	$(1.20)	$(1.06)	$(2.84)	$(4.04)
		Bill increase	18%	$3.60	$2.07	$11.31	$1,800.56
		No change	26%	-	-	-	-
SFA3	Block 1: $0.0947 Block 2: $0.1207	Bill decrease	46%	$(0.87)	$(0.73)	$(2.05)	$(2.74)
		Bill increase	54%	$0.76	$0.48	$2.59	$899.44

PSE PUGET SOUND ENERGY

Average monthly use distribution by HELP Assistance (truncated at 99% or <7,934 kWh)

No Assistance:
Mean: 788 kWh
Median: 656 kWh

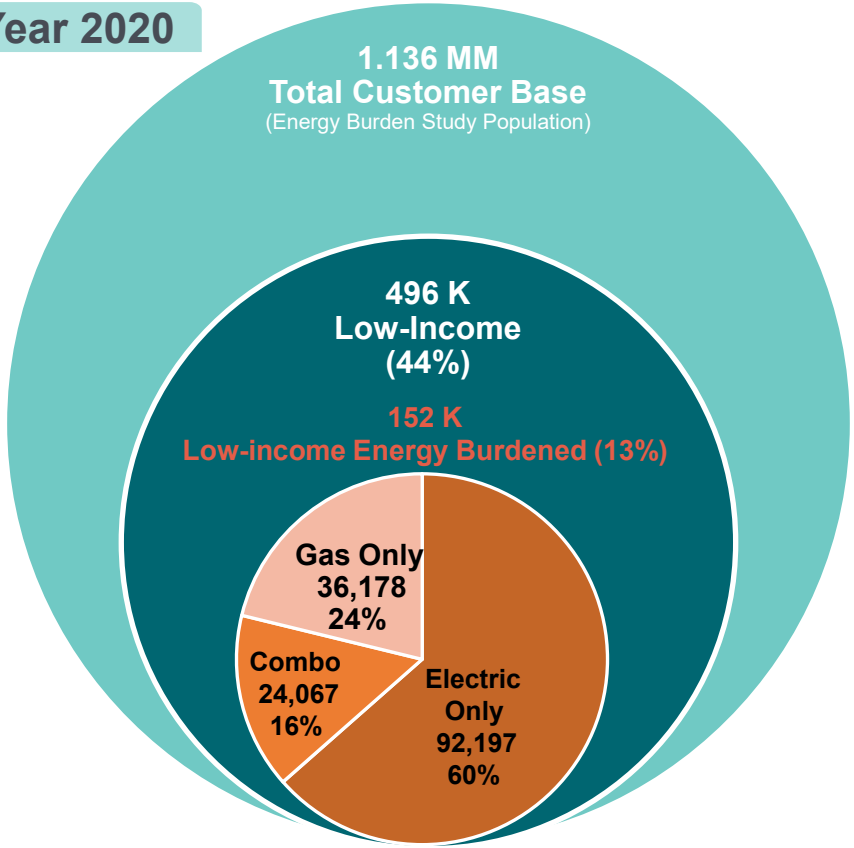
PSE HELP:
Mean: 901 kWh
Median: 795 kWh



PUGET SOUND ENERGY

PSE Energy Burden Analysis CY 2020 Results

Calendar Year 2020



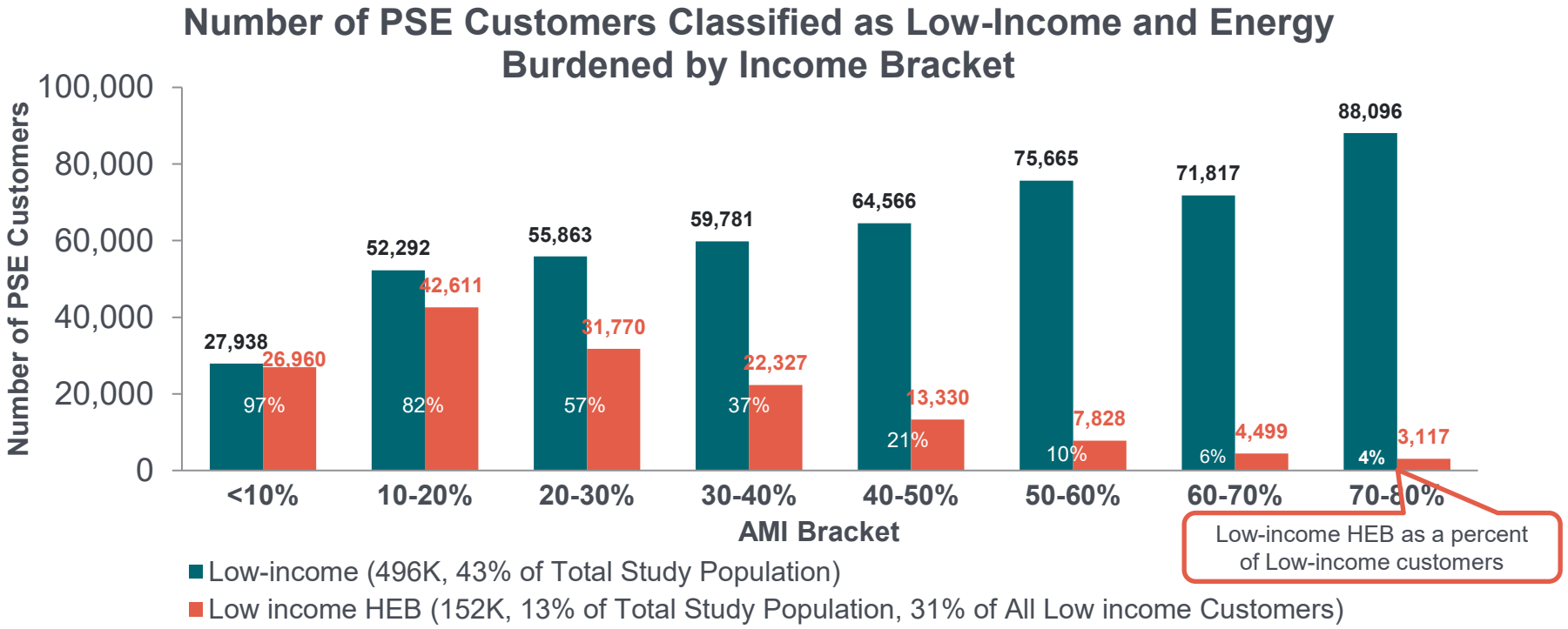
The Who & Why

- Vast **majority of energy burdened** customers are classified as ***low-income*** → income is the primary driver of energy burden
- **High energy burden customers use *more energy on average*** than overall residential customers
- **High energy burden is more likely among already *vulnerable populations*** (ethnic background, education, homeownership, dwelling type, seniors and fixed-income status)

*Note: Energy burden analysis includes roughly 80% of total customer base because of several data challenges

PUGET SOUND ENERGY

Large majority of Low Income Energy Burdened customers belong to the lowest income brackets



*Note: Energy burden analysis includes roughly 80% of total customer base because of several data challenges

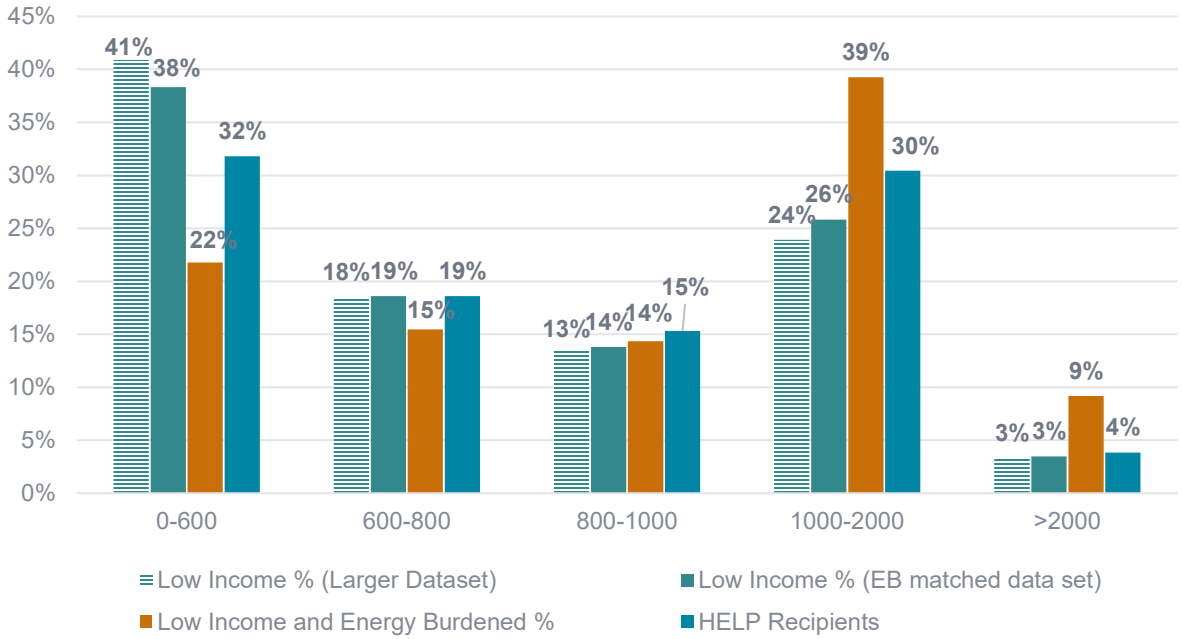
PUGET SOUND ENERGY

Summary Statistics of Average Monthly Usage: Low Income Energy Burdened customers have much higher average usage than their Low Income and Non-Low Income counterparts

Statistics	Population	Low Income	Non-Low Income	PSE HELP	Low Income Energy Burdened
N	1,317,855	468,434	590,810	25,807	97,752
StDev	661 kWh	563 kWh	646 kWh	535 kWh	719 kWh
Mean	**790 kWh**	**813 kWh**	**881 kWh**	**907 kWh**	**1,117 kWh**
Q1	403 kWh	452 kWh	478 kWh	532 kWh	643 kWh
Median	**658 kWh**	**692 kWh**	**729 kWh**	**802 kWh**	**978 kWh**
Q3	1,026 kWh	1041 kWh	1192 kWh	1165 kWh	1,426 kWh
99%	2,791 kWh	2,604 kWh	2,996 kWh	2,617	3,335 kWh
Maximum	244,698 kWh	31,618 kWh	67,193 kWh	7,923 kWh	31,618 kWh

PUGET SOUND ENERGY

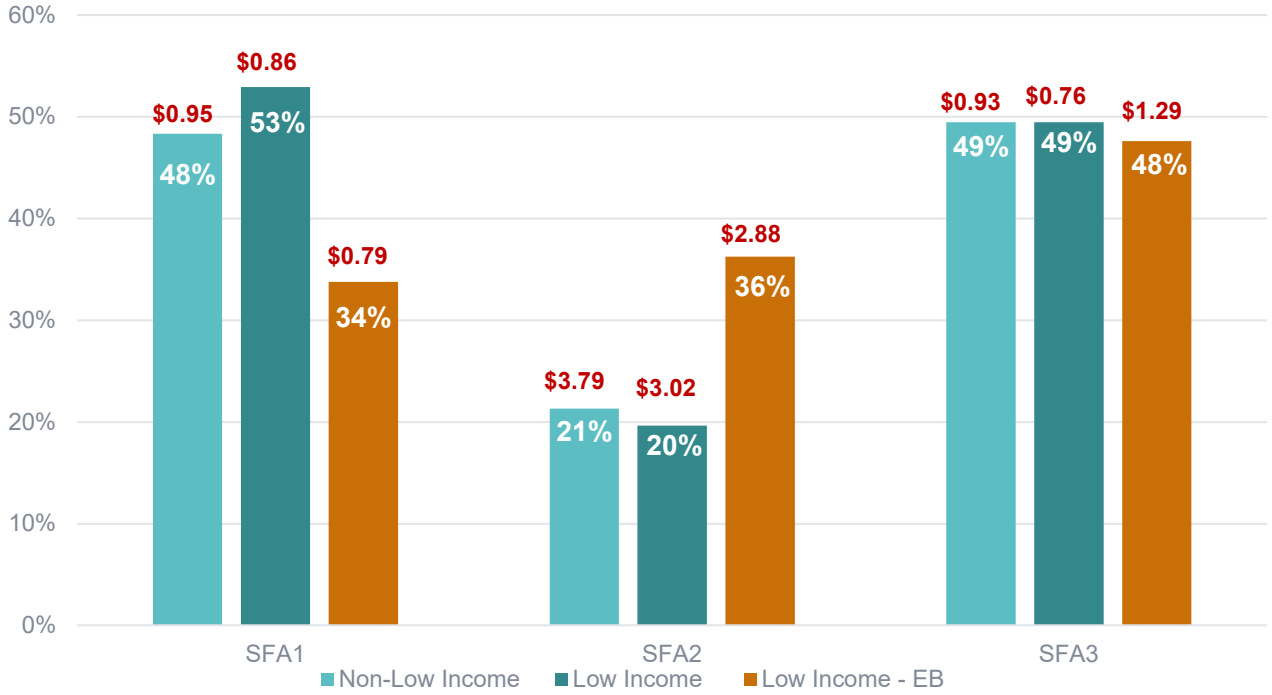
Percentage of Low Income and Energy Burdened Customers by Monthly Average Usage Range: Over 60% of Low Income Energy Burdened customers average usage is over 800 kWh per month



- Majority of non-low income customers' average monthly usage are below 800 kWh
- On the other hand, nearly 50% of PSE HELP recipients tend to use 800 kWh or more on average.
- However low income energy burdened customers tend to consume more on average, above 1000 kWh.
- Additionally, about 9% of low income energy burdened customers use more than 2000 kWh on average compared to 3% of all low income customers and HELP recipients.

PUGET SOUND ENERGY

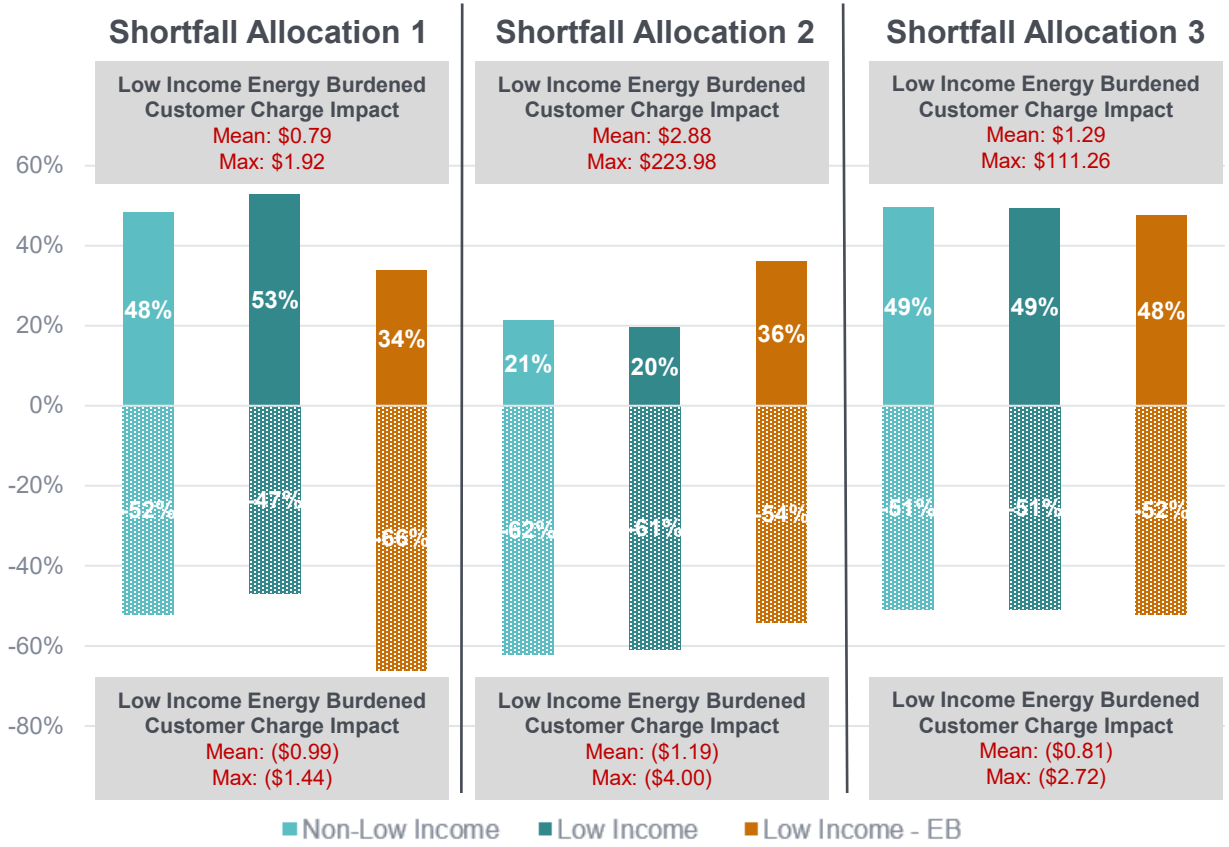
Percentage of Customers most likely to expect an increase in average bill



- About 50% customers expect to experience a bill increase from SFA1 and SFA3.
- In SFA2, about 20% customer expect to experience average bill increase. However, the average dollar impact is higher.
- The impacts are similar for low income and non-low income customers, but energy burdened low income customers impacts are slightly different.
- A higher percentage of low income energy burdened customers may see a bill increase in SFA2 because of their comparatively high average monthly usage.

PSE PUGET SOUND ENERGY

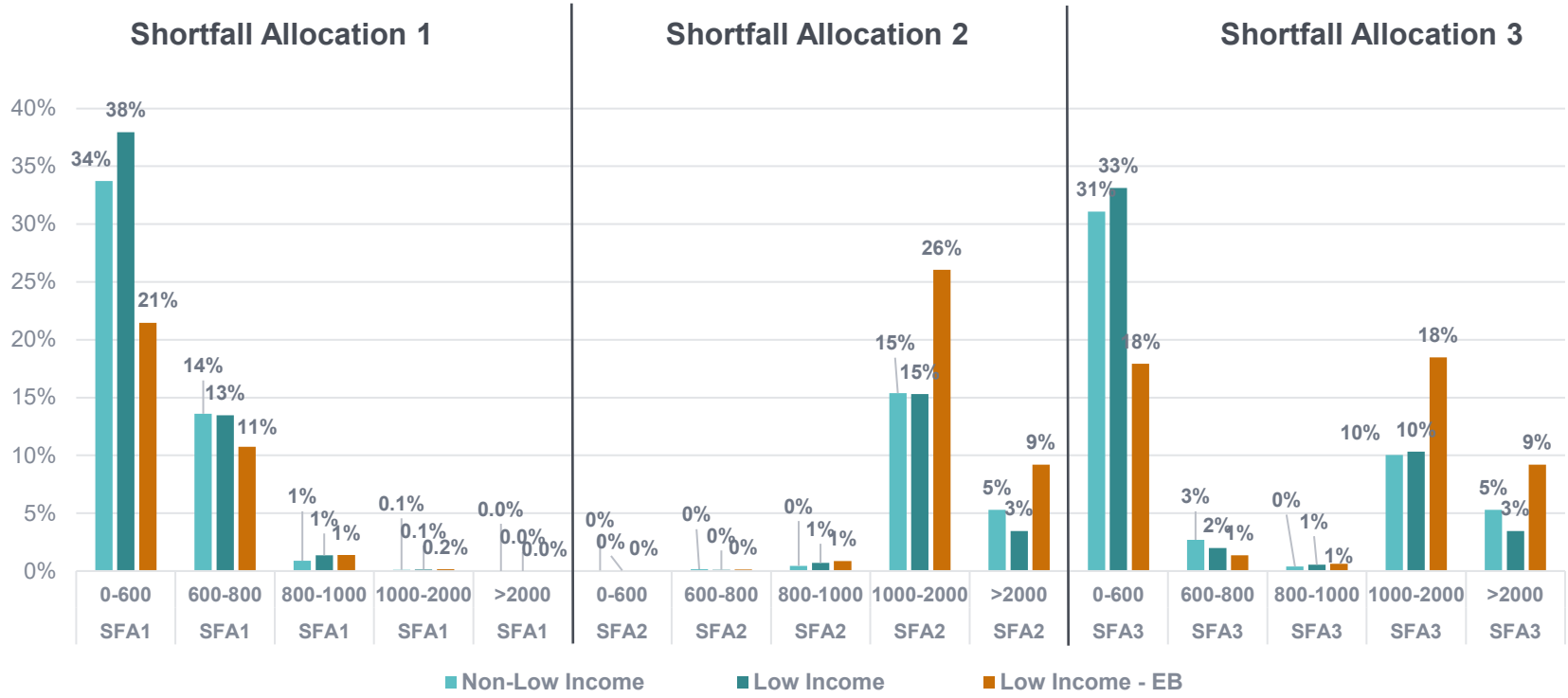
Customer Impact Overview: Energy Charge increases are more pronounced than savings, especially for Low Income Energy Burdened customers



- The percentage impacts are similar across the income groups but slightly different for the low income energy burdened (LI-EB) group.
- For SFA2, half of LI-EB customers who experience an increase will see bills go up from ~$3 to over $200 a month.
- SFA3 can also lead to monthly increases for LI-EB up to $111.
- The mean decrease is ~$1 per month and no more than $4.

PSE PUGET SOUND ENERGY

Expected increase in average annual impact; customers energy charge increase distributed across usage range from previous slide



PUGET SOUND ENERGY

Revenue Shortfall Allocation Impact Summary: All three SFA methods will produce winners and losers; SFA1 has least impact as shortfall is distributed to the largest percentage of customers

- SFA1 will increase the energy charges for customers at lower usage level by about $1 on average but no more than $1.92. In fact, customers with higher usage level will experience an overall bill decrease. This method will have somewhat equitable distribution of the shortfall across customers.

- SFA2 will not impact customers whose monthly usages are below 600 kWh. Customers using 800 kWh or less in fact will experience a bill decrease of less than $2 on average (up to $4). However, customers at the very high usage level will experience a bill increase of $9 on average (up to $224).

- Similar to SFA1, method SFA3 will impact all customers. In this method, customers at the middle usage blocks will benefit but higher usage customers again will face a significant bill increase, but it will be smaller than SFA2.

PSE PUGET SOUND ENERGY

Final Takeaway: Expanding the first energy block to 800 kWh has unintended consequences

- The impacts from the proposed change are quite similar across non-low income and low income customers. However, ***the consequences (bill increase) are more pronounced for low income energy burdened customers as a group due to their higher usage***
- The shortfall allocations, along with the increase in kWh threshold for the first block, will have varied bill impact for all customers
  - While some customers will benefit, the decrease to these customers' average bill may not be significant
  - ***For those customers who will experience a bill increase, the impacts may be considerable***
- Since ***62% of low income energy burdened customers use more than 800 kWh on average per month***, some of these customers could experience a substantial bill increase with SFA2 and SFA3

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APPENDIX

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