

Pacific Gas and Electric Company

Residential Rate OIR Rate Design and Bill Impact Analysis Model

User Guide

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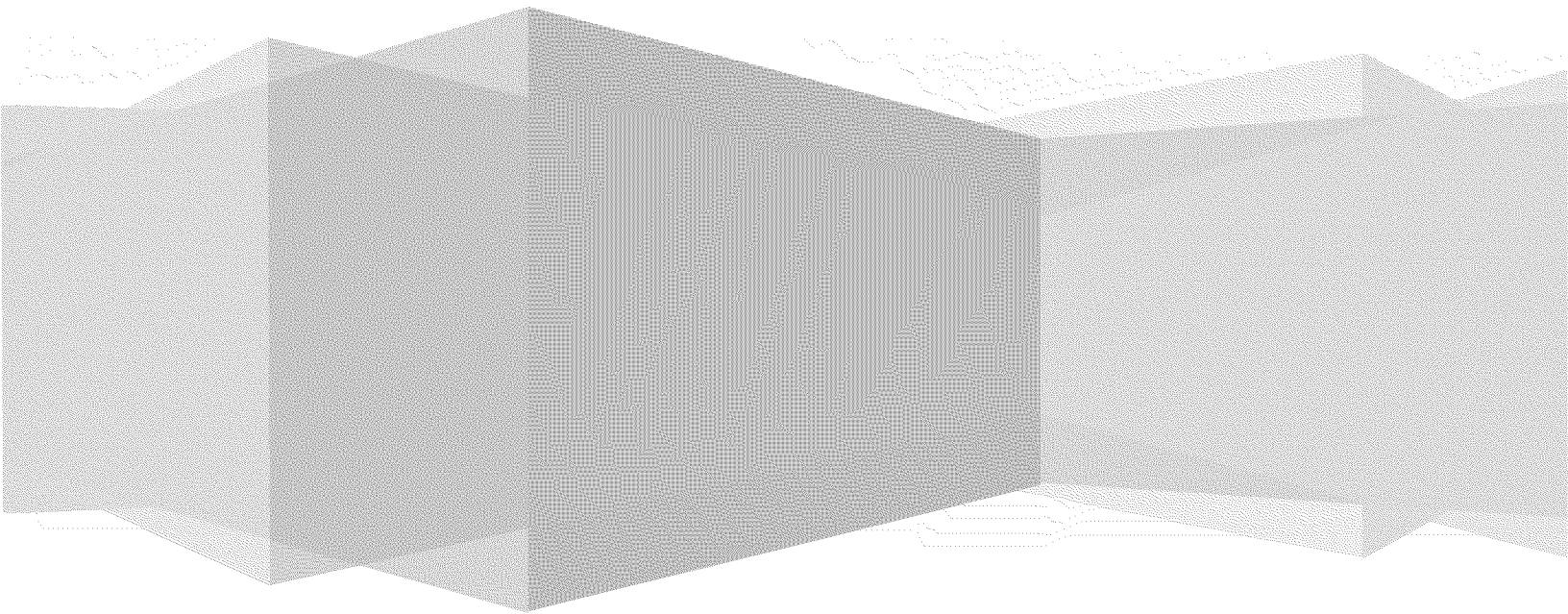


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Residential Rate OIR

Rate Design and Bill Impact Analysis Model

User Guide



Overview

PG&E's Electric Bill Calculation Tool provides users with a tool that can be used to evaluate the residential rate and customer bill impacts of several rate structures when compared to rates set at **Cost-of-Service** levels. Specific components of electric rate structures that may be evaluated in this tool include:

- 1) Fixed Customer Charges (Single or **Split Demand-Based**)
- 2) Minimum Charges
- 3) Flat Volumetric Rates
- 4) Tiered Rates (Two Tiers or Multiple Tiers)
- 5) TOU¹ Rates with Baseline Credits

Once alternative rate scenarios have been run, several outputs are provided showing comparative rate and bill impacts as they relate to Cost-Based, **Current**, TOU and various non-TOU rates. Information is also provided showing: 1) correlations between Usage and Income for PG&E customers in several geographic areas; and 2) estimated energy consumption changes resulting from a move from an Inclining Block Rate design to a Flat Rate design and from a Flat Rate design to TOU rates.

Methodology

Description of Inputs and Running Instructions

“Summary” Tab – Manual inputs to the Tool are made in the Summary tab. The Summary tab also contains summary tables showing resulting residential rate impacts based on the inputs.

Inputs Field – The Inputs Field is used to make all manual inputs to the Tool. Inputs are made to set user-specified conditions for various residential rate scenarios (see Figure 1).

Note: The rate and bill impacts provided in this Tool will only utilize appropriate inputs. For example, if a single-tier (i.e. Flat) rate design is designated, any specified tier differentials will be

¹ TOU – Time of Use

ignored.

Rate Design Inputs Non TOU and TOU	
Calculate Non TOU Rates	Current Rate Date 7/1/2012
Update Non TOU Reports	2 Tier Rate Ratio => 20%
	# of Tiers => 1
	Select Baseline Allowance => 51%
(Note: Baseline Allowance not functioning at the moment)	
	Enter Tier Delta (cents/kWh) => 4.00
	T1 Increase (Over Current) 3%
	T2 Increase (Over Current) 3%
	Minimum Charge imposed in lieu of Customer Charge No
	Cust Charge \$/Mo. -
	Fixed Charge High Demand \$/Mo. -
	Fixed Charge Low Demand \$/Mo. -
	Fixed Charge Break Point kW 8.00
	Frozen CARE T1/T2 <input type="checkbox"/>
	Use existing CARE Tier-3 rate <input type="checkbox"/>
	Care Discount 20%
Additional TOU Rate Design Specific Inputs	
	TOU Rate Percent Differential: On-peak, Part-peak, Offpeak 50%
	TOU Base Line Credit in cents per kWh 0%
Calculate TOU Rates	
Update TOU Reports	

Figure 1

Rate Design Inputs (Non-TOU and TOU)

- **Current Rate Date** – The date on which Current Rates became effective.
- **2 Tier Rate Ratio** – The tier differential that will be applied to Tier-1 and Tier-2 rates in a two-tier rate design. For example, a 20 percent ratio would result in a Tier-2 rate that is 20 percent higher than the Tier-1 rate.
- **# of Tiers** – Dropdown box allows the user to choose a tiered rate design that incorporates from 1 up to 5 rate tiers.
- **Select Baseline Allowance** – The percentage of residential electricity use that occurs at, or below, the baseline allowance amount (i.e., tier-one usage). Dropdown box allows the user to choose from between 50 and 55 percent (the current baseline allowance percentage). **Note: This input is not functional at this time.**
- **Tier Delta (cents/kWh²)** – The absolute cent-per-kWh differential that is applied to rate tiers when the number of tiers specified in the “# of Tiers” dropdown box is greater than three.
- **Tier 1 Increase (Over Current)** – The percentage by which to increase the current Tier-1 rate. This input is used when the number of tiers specified in the “# of Tiers” dropdown box is greater than two.
- **Tier 2 Increase (Over Current)** – The percentage by which to increase the current Tier-2 rate. This input is used when the number of tiers specified in the “# of Tiers” dropdown box is greater than two.
- **Minimum Charge imposed in lieu of Customer Charge** – Dropdown box allow the user to specify “Yes” or “No.” A minimum charge applied to any bill for monthly kWh usage up to a given level. For example, assume a minimum charge of \$4.00 and an electric rate of \$0.10 per kWh. A minimum charge of \$4.00 would be apply to any use up to 40 kWh ($\$0.10 \text{ per kWh} \times 40 \text{ kWh} = \4.00). The per-kWh rate would apply directly to any use in excess of 40 kWh. For instance, assuming monthly use of 41 kWh, a customer would pay \$4.10 ($\$0.10 \text{ per kWh} \times 41 \text{ kWh} = \4.10).

Note: When “Yes” is designated for a Minimum Charge, a Customer Charge will not apply.

- **Customer Charge (\$/Mo.)** – Fixed Monthly Customer Charge amount.
- **Fixed Charge Break Point (kW)** – The user-defined kW threshold at which a Fixed Monthly Customer Charge amount for high-demand customers will be applied. Customers with demand levels below the threshold will pay the Fixed Monthly Customer Charge amount for low-use customers. This input is utilized when a Split Demand-Based Customer Charge rate design is designated.
- **Fixed Charge High Demand (\$/Mo.)** – Fixed Monthly Customer Charge amount for high-use customers (used for a Split Demand-Based Customer Charge rate design).
- **Fixed Charge Low Demand (\$/Mo.)** – Fixed Monthly Customer Charge amount for low-use customers (used for a Split Demand-Based Customer Charge rate design).

² Kilowatt Hour

- *Frozen CARE³ T1/T2* – Click to put a check in the box. A checked box will freeze CARE Tier-1 and Tier-2 rates at their current levels.
- *Use Existing CARE Tier-3 Rate* - Click to put a check in the box. A checked box will freeze the CARE Tier-3 rate at its current level.
- *CARE Discount* – The rate discount percentage applied to the rates paid by customers qualifying for low income rate discounts.

Additional TOU Rate Design Specific Inputs

- *TOU Rate Percentage Differential: On-Peak; Partial-Peak, Off-Peak* – The percentage rate differential that is applied to each rate in the three TOU periods⁴. For example, assuming a 50 percent differential, the Partial-Peak rate would be 50 percent higher than the Off-Peak Rate and the On-Peak rate would be 50 percent higher than the Partial-Peak rate. In each case, a factor of 1.50 is applied.
- *TOU Baseline Credit in Cents per kWh* – A credit applied to bills calculated for customers utilizing TOU rates. The credit is applied on a per kWh basis for electric usage up to a customer’s baseline allowance. For instance, assuming a monthly baseline allowance of 500 kWh, a customer with monthly use of 400 kWh would receive a credit equal to the specified per-kWh baseline credit times 400 kWh, a customer with monthly use of 500 kWh would receive a credit equal to the specified per-kWh baseline credit times 500 kWh, and a customer with use in excess of 500 kWh would receive a credit limited to the specified per-kWh baseline credit times 500 kWh.

Running Instructions

Once the necessary inputs have been made to run a given rate scenario, rate calculations are accomplished as follows:

Step 1 - Calculate Non-TOU Rates – Click on the “Calculate Non-TOU Rates” button located in the Inputs area of the tab.

Step 2 - Calculate TOU Rates - Click on the “Calculate TOU Rates” button located in the Inputs area of the tab.

Step 3 - Update the Various Rate and Bill Impact Tables provided in the Tool to reflect Non-TOU rates – Click on the “Update Non-TOU Reports” button located in the Inputs area of the tab.

Step 4 - Update the Various Rate and Bill Impact Tables provided in the Tool to reflect TOU rates – Click on the “Update TOU Reports” button located in the Inputs area of the tab.

³ CARE - California Alternative Rates for Energy

⁴ Application of a uniform percentage differential between each rate in the three TOU periods is a simplifying assumption. The actual ratios computed based on cost may not be significantly different.

Rate Summary Tables

Two rate summary tables are provided in the "Summary" tab.

1) *Non-TOU Residential Rates Calculated Based on Inputs* (see Figure 2).

Information includes:

- Recorded Non-CARE and CARE 2011 sales by rate tier
- Percentage of 2011 sales by rate tier
- Current rates by tier
- Estimated Non-TOU Rates by tier
- Customer Charge
- Split Demand-Based Customer Charge

Resulting Flat Rate						
Non-CARE	Tier	Forecast		Jul-12	Flat Rate	
		Sales (GW/h)	% of Sales		Rate	Rate
	1	11.59	61%	12.8	17.2	
	2	2.20	12%	14.6	17.2	
	3	2.92	15%	29.6	17.2	
	4	1.47	8%	33.6	17.2	
	5	0.79	4%	33.6	17.2	
		Cust \$/Mo		0.0	0.0	
		Fixed Charge High Demand \$/Mo		-	0.0	
		Fixed Charge Low Demand \$/Mo			0.0	
		Min Charge \$/Mo		0.0	0.0	
CARE	Tier	Forecast		Jul-12	Flat Rate	
		Sales (GW/h)	% of Sales		Rate	Rate
	1	7.05	69%	8.3	13.8	
	2	1.10	11%	9.6	13.8	
	3	1.30	13%	12.5	13.8	
	4	0.53	5%	12.5	13.8	
	5	0.24	2%	12.5	13.8	
		Cust \$/Mo		0.0	0.0	
		Fixed Charge High Demand \$/Mo		0.0	0.0	
		Fixed Charge Low Demand \$/Mo		0.0	0.0	
		Min Charge \$/Mo		0.0	0.0	

Figure 2

2) *TOU Residential Rates Calculated Based on Inputs* (see Figure 3).

Information Includes:

- Non-CARE and CARE Forecast Sales by TOU period
- Percentage of sales by peak period
- Estimated Seasonal TOU rates
 - On-Peak
 - Partial-Peak
 - Off Peak

- Customer Charge
- Split Demand-Based Customer Charge

Resulting TOU Rate				
Non-CARE	Forecast		% of Sales	Rate
	Period	Sales (GWh)		
	Summer On-Peak	1.99	10%	31.8
	Summer Part-Peak	2.35	12%	21.2
	Summer Off-Peak	4.99	26%	14.1
	Winter Part-Peak	1.11	6%	14.8
	Winter Off-Peak	8.54	46%	14.8
	Cust \$/Mo.			0.0
	Fixed Charge High Demand \$/Mo.			0.0
	Fixed Charge Low Demand \$/Mo.			0.0
	Min Charge \$/Mo.			0.0
CARE	Forecast		% of Sales	Rate
	Period	Sales (GWh)		
	Summer On-Peak	1.14	11%	25.5
	Summer Part-Peak	1.32	13%	17.0
	Summer Off-Peak	2.79	27%	11.3
	Winter Part-Peak	0.57	6%	11.9
	Winter Off-Peak	4.41	43%	11.9
	Cust \$/Mo.			0.0
	Fixed Charge High Demand \$/Mo.			0.0
	Fixed Charge Low Demand \$/Mo.			0.0
	Min Charge \$/Mo.			0.0

Figure 3

Average Rate Impact Summary Tables

A summary table is provided in the “Summary” tab showing: 1) Average Rate Impact Summaries by Zone; and 2) Rate Design Measures (see Figure 4)

1) *Rate Impact Summary by Zone*

Information includes:

- Non-CARE and CARE average system-wide and geographical area average rate impacts
 - **Cost-Based Rates**
 - Current Rates
 - Proposed Non-TOU Rates
 - Proposed TOU Rates

2) *Rate Design Measure Table* – The Rate Design Measures Table provides the following information as it relates to Current Rates, Non-TOU Rates and TOU Rates (see Figure 5):

- Residential CARE Subsidy (M\$)
- Non-Residential Estimated CARE Subsidy (M\$)
- Effective CARE Discount Percentage
- Percentage of Fixed Cost Recovery⁵

⁵ The percentage of total fixed costs that are recovered through a given level of fixed charges.

- Percent Fixed Cost Not Recovered⁶

Average Rate Impact Summary (Cents / kWh) by Zone					
NON-CARE					
Baseline Region	Cost Base Rate	Jul-12 Rate	Proposed Non-TOU Flat Rate	Proposed TOU Rate	
Coast (Q, T, V)	15.9	18.3	17.2	17.5	
Hills (X)	16.5	18.1	17.2	17.1	
Inner Valley (S, P)	16.7	18.0	17.2	17.0	
Outer Valley (R, W, Y, Z)	16.8	17.9	17.2	17.0	
Non-CARE System	16.5	18.1	17.2	17.2	
CARE					
Baseline Region	Cost Base Rate	Jul-12 Rate	Proposed Non-TOU Flat Rate	Proposed TOU Rate	
Coast (Q, T, V)	16.3	9.3	13.8	14.3	
Hills (X)	17.0	9.2	13.8	14.2	
Inner Valley (S, P)	17.1	9.3	13.8	13.8	
Outer Valley (R, W, Y, Z)	17.3	9.3	13.8	13.9	
CARE System	17.0	9.3	13.8	14.0	
Rate Design Measures					
		Current Rate Levels	Non-TOU Flat Rate	TOU	
	Residential CARE Subsidy (\$M) =>	\$ 717,000,000	\$ 253,000,000	\$ 243,000,000	
	Residential CARE subsidy funded by non-residential class (\$M) =>	\$ 501,900,000	\$ 177,100,000	\$ 170,100,000	
	Effective CARE Discount % =>	49%	20%	20%	
	Percent of Fixed Costs Recovery =>	0%	0%	0%	
	Percent Fixed Cost Not Recovered	22%	22%	22%	

Figure 4

Tool Outputs

“PGE-Bill-Impact-Output” Tab – Bill impact information is provided in tabular and graphic form in this tab. The information is segmented based on levels of percentage bill impacts that will be experienced by customers. A dropdown box is used to show bill impacts specific to Non-CARE, CARE or All Customers (see Appendix A).

Data Source: 2009 RASS sample merged with 2011 recorded usage.

The information provided in the bill impact tables includes:

- Bill Percentage Change Groups
- Number of Customers in Each Group
- Percentage of Customers in Each Group
- Average Monthly Kwh Use of Customers in Each Group
- Average Load Factor of Customers in Each Group
- Average “On-Peak” Percentage of Customers in Each Group

⁶ This represents the percentage of total costs that are NOT collected through fixed charges. In the example shown in Figure 4, no costs are collected through fixed charges. Accordingly, one can conclude that 22 percent of total costs are fixed costs. If all fixed costs (i.e., 22 percent of total costs) were collected through a fixed charge(s), the “Fixed Cost Recovery Deviation from Cost” would be 0 percent.

- Average Current Rates for Customers in Each Group
- Average Proposed Rates for Customers in Each Group
- Average Percentage Rate Change for Customers in Each Group
- Average Current Bills for Customers in Each Group
- Average Proposed Bills for Customers in Each Group
- Average Bill Change for Customers in Each Group

“PGE-Rate-Efficiency-Output” Tab – This tab shows various rates and percentage rate changes from Current Rates (see Appendix B). The information is presented in tabular and graphic form based on average kWh usage levels.

The information shown in the rate tables includes:

- Average Monthly Usage-Level Categories
- Average Cost-Based Rate by Usage Level
- Average Current Rates by Usage Level
- Average Non-TOU Rate by Usage Level
- Average TOU Rate by Usage Level
- Cost-Based Rate Percentage Change from Current Rates
- Proposed Non-TOU Rate Percentage Change from Current Rates
- Proposed TOU Rate Percentage Change from Current Rates

“PGE-Bill-And-Revenue-Study \$” Tab – This tab shows the difference in monthly average bills and annual revenue recovery when cost of service is compared to current and optional rate designs (see Appendix C). The information is segmented based on average kWh usage levels.

The information shown in the tables in this tab includes:

- Average Monthly Usage-Level Categories
 - Cost-Based Rates
 - Current Rates
 - Non-TOU Rates
 - TOU Rates
 - Current, Non-TOU and TOU Average Monthly Bill Differences when Compared to Cost-Based Rates
- Total Annual Revenue by Average Monthly Usage Levels
 - Cost-Based Rates
 - Current Rates
 - Non-TOU Rates
 - TOU Rates
 - Current, Non-TOU and TOU Total Annual Revenue Differences when Compared to Cost-Based Rates

“Correlation” Tab – This tab includes instructive content related to the correlation between usage and income (see Appendix D).

The information provided in the tab includes:

- Chart Showing Correlation Between Usage and Income for: 1) All Customer; 2) Non-CARE Customers; and 3) CARE Customers in Several Geographic Areas
 - Coast
 - Hills
 - Inner Valley
 - Outer Valley
 - PG&E Service Territory
- Scatter Graphs Showing
 - Correlation = 0 (No Correlation)
 - Correlation = 1 (Full Correlation)
 - Correlation - .23 (Low Correlation)
 - Income Vs. Usage for Non-CARE and Care Households
 - Subsidization by Lower Income Customers Due to Low Correlations
- Tables showing Income versus Usage levels for Non-CARE and CARE Customers
- Tables showing subsidization resulting from lack of correlation

“Cost-Based-Rate-Drivers” Tab – This tab shows the major Electric Rate cost components along with their cost-based allocations (see Appendix E).

The information provided in the tab includes:

- Cost Components
 - Generation Energy Charges by Season and Peak Period (i.e., On-Peak, Partial-Peak, Off-Peak)
 - Generation Capacity Cost
 - Transmission Capacity Cost
 - Primary/Secondary Distribution Capacity Costs
 - Customer Access Charge
 - Other Fixed Charges
- Marginal Cost of each Component
- Allocation Methodology for each Component
- Graphic Depiction of Annual Generation and Transmission Capacity Cost Profiles

“Energy Conservation” Tab – This tab shows estimated consumptions changes when moving from one rate design to another (see Appendix F).

The information provided in the tab includes:

- Tables Showing Estimated Annual kWh Consumption Changes for Non-CARE and CARE Customers When Moving from:
 - Current (Inclining Block) Rates to Flat Rates
 - Flat Rates to TOU Rates

Definitions

Cost-Based Rates – Rates based on costs that are largely consistent with 2011 General Rate Case (GRC) data. The **revenue requirement** used in calculating rates is consistent with 1011 GRC Phase-II submission, adjusted for the 2009 RASS sample merged with 2011 usage data.

Cost of Service – Customer class cost of service allocation that is aligned with marginal cost allocation principles.

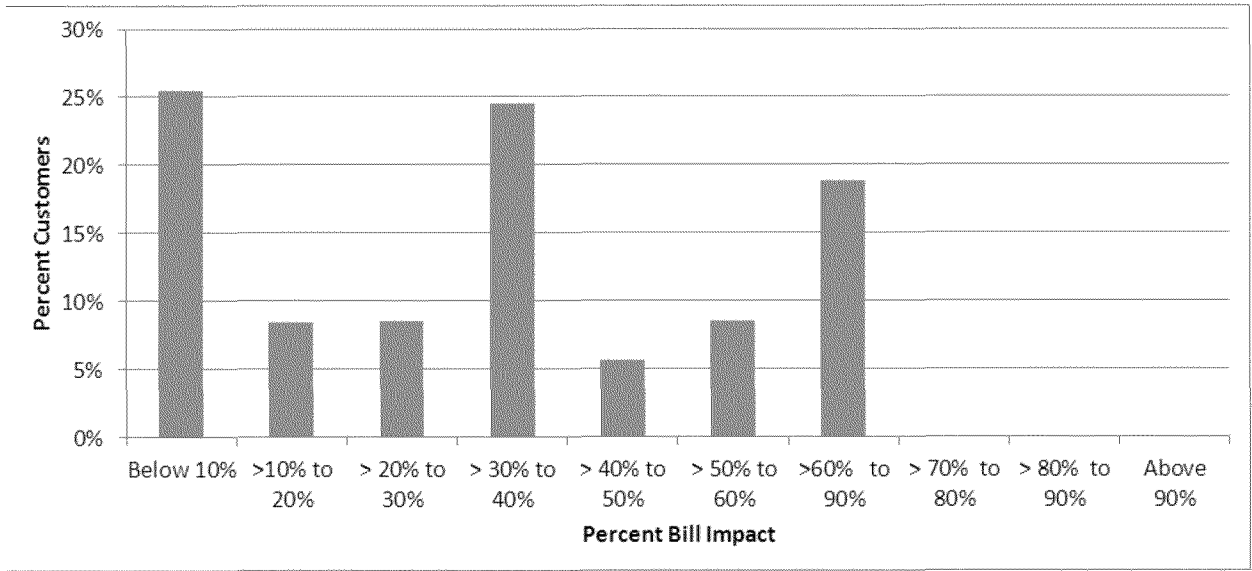
Current Rates – Currently effective residential rate designs and/or rate levels.

Split Demand-Based Customer Charges – Fixed monthly customer charges that vary depending on customers' levels of electric (kW) demand.

Appendix A: "PGE-Bill-Impact-Output" Tab

All Customers

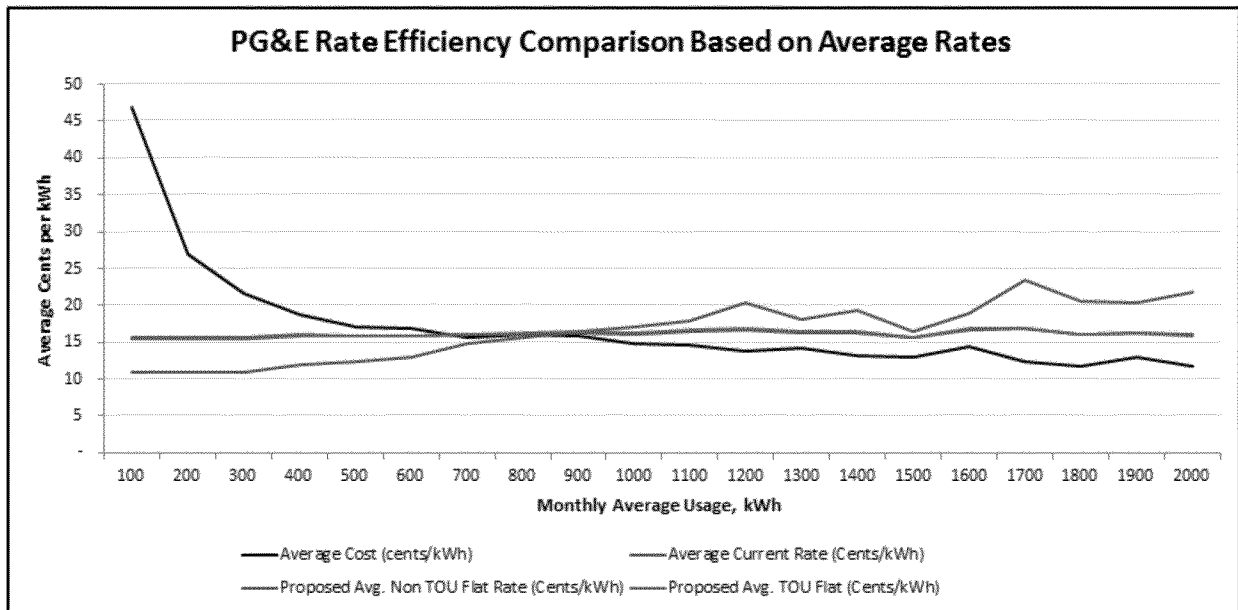
Non TOU Flat Rate Design Impacts All Customers



Non TOU Flat Rate Design Impacts All Customers

Impact	Customer		Average		Average Cents/kWh			Monthly \$			Average Bill to Income Ratio	
	Number	Percent	Monthly kWh	LF	Jul-12	Proposed	Change	Jul-12	Proposed	Change	Jul-12	Proposed
Below 10%	1,177,272	25%	829	15%	20.75	17.25	-17%	171.97	142.97	(29.00)	1.9%	1.6%
>10% to 20%	390,147	8%	549	14%	14.69	16.95	15%	80.69	93.07	12.38	0.9%	1.0%
> 20% to 30%	395,818	9%	527	13%	13.03	16.39	26%	68.72	86.43	17.70	0.9%	1.1%
> 30% to 40%	1,132,539	25%	357	12%	11.92	15.96	34%	42.51	56.95	14.44	0.7%	0.9%
> 40% to 50%	261,070	6%	702	16%	9.52	13.80	45%	66.86	96.89	30.03	2.0%	2.9%
> 50% to 60%	394,745	9%	500	14%	8.89	13.80	55%	44.42	68.93	24.52	1.5%	2.4%
>60% to 90%	869,989	19%	288	13%	8.39	13.80	64%	24.13	39.69	15.56	1.1%	1.8%
> 70% to 80%	-	0%	-	0%	-	-	0%	-	-	-	0.0%	0.0%
> 80% to 90%	-	0%	-	0%	-	-	0%	-	-	-	0.0%	0.0%
Above 90%	-	0%	-	0%	-	-	0%	-	-	-	0.0%	0.0%
Group Total	4,621,580	100%	527	14%	15.01	16.04	7%	79.03	84.46	5.43	1.3%	1.4%

Appendix B: "Rate-Efficiency-Output" Tab



Cost of Service vs. Current and Proposed Rate Designs							
Average Monthly Usage	Average Cost (cents/kWh)	Average Current Rate (Cents/kWh)	Proposed Avg. Non TOU Flat Rate (Cents/kWh)	Proposed Avg. TOU Flat (Cents/kWh)	Percent Change-Current	Percent Change-Proposed Non TOU Flat Rate	Percent Change-Proposed TOU
100	46.88	10.83	15.63	15.49	-77%	-67%	-67%
200	26.91	10.93	15.71	15.50	-59%	-42%	-42%
300	21.51	10.90	15.60	15.47	-49%	-27%	-28%
400	18.75	11.90	16.01	15.86	-37%	-15%	-15%
500	17.09	12.42	15.91	15.83	-27%	-7%	-7%
600	16.96	12.94	15.78	15.83	-24%	-7%	-7%
700	15.72	14.88	16.05	16.10	-5%	2%	2%
800	16.05	15.61	16.15	16.28	-3%	1%	1%
900	15.82	16.48	16.20	16.36	4%	2%	3%
1000	14.81	17.14	16.09	16.19	16%	9%	9%
1100	14.70	17.95	16.38	16.61	22%	11%	13%
1200	13.76	20.35	16.73	16.88	48%	22%	23%
1300	14.21	18.06	16.23	16.43	27%	14%	16%
1400	13.24	19.42	16.33	16.44	47%	23%	24%
1500	12.90	16.56	15.59	15.69	28%	21%	22%
1600	14.36	18.92	16.59	16.79	32%	16%	17%
1700	12.41	23.48	16.85	16.94	89%	36%	36%
1800	11.72	20.57	16.02	15.96	76%	37%	36%
1900	12.90	20.39	16.28	16.28	58%	26%	26%
2000	11.77	21.89	15.95	15.80	86%	36%	34%

Appendix C: "PGE-Bill-And-Revenue Study" Tab

Cost of Service vs. Current and Proposed Rate Designs							
Monthly Average Bill					Difference from Cost		
Monthly Usage	Cost	Current Total	Non IOU Total	IOU Total	Current Total	Proposed Total	IOU Total
100	\$29.76	\$6.87	\$9.92	\$9.83	(\$22.89)	(\$19.84)	(\$19.93)
200	\$41.46	\$16.84	\$24.20	\$23.87	(\$24.62)	(\$17.26)	(\$17.59)
300	\$53.73	\$27.23	\$38.96	\$38.63	(\$26.50)	(\$14.77)	(\$15.10)
400	\$65.68	\$41.69	\$58.08	\$55.54	(\$23.99)	(\$9.60)	(\$10.14)
500	\$75.77	\$55.04	\$70.53	\$70.18	(\$20.73)	(\$5.24)	(\$5.59)
600	\$92.82	\$70.82	\$86.40	\$86.63	(\$22.00)	(\$6.42)	(\$6.19)
700	\$101.68	\$86.22	\$103.83	\$104.12	(\$5.45)	\$2.15	\$2.44
800	\$120.00	\$116.70	\$120.77	\$121.73	(\$3.30)	\$0.77	\$1.73
900	\$133.91	\$139.48	\$137.13	\$138.46	\$5.57	\$3.22	\$4.55
1000	\$141.16	\$163.37	\$153.35	\$154.31	\$22.21	\$12.20	\$13.15
1100	\$153.53	\$187.40	\$170.97	\$173.47	\$33.87	\$17.44	\$19.94
1200	\$157.12	\$232.41	\$191.02	\$192.74	\$75.29	\$33.90	\$35.82
1300	\$178.05	\$226.30	\$203.41	\$205.84	\$48.25	\$25.36	\$27.79
1400	\$177.84	\$260.80	\$219.29	\$220.80	\$82.97	\$41.45	\$42.96
1500	\$187.85	\$241.08	\$227.01	\$228.49	\$53.24	\$39.17	\$40.64
1600	\$219.45	\$289.17	\$253.50	\$256.58	\$69.72	\$34.06	\$37.13
1700	\$202.16	\$382.43	\$274.42	\$275.80	\$180.27	\$72.26	\$73.63
1800	\$204.54	\$359.49	\$279.49	\$278.41	\$154.46	\$74.95	\$73.87
1900	\$238.31	\$376.62	\$300.80	\$300.68	\$138.31	\$62.49	\$62.37
2000	\$290.85	\$540.80	\$394.19	\$390.45	\$249.95	\$103.34	\$99.59
Total	\$87.65	\$79.03	\$84.46	\$79.03	(\$8.62)	(\$3.19)	(\$9.62)

Appendix D: Correlation Table

Annual Revenue							
Difference from Cost					Difference from Cost		
Monthly Usage	Cost	Current Total	Non IOU Total	IOU Total	Current Total	Proposed Total	IOU Total
100	\$63,598,991.55	\$14,687,896.16	\$21,208,415.18	\$21,010,275.85	(\$48,911,095.39)	(\$42,390,576.37)	(\$42,588,715.69)
200	\$221,271,215.45	\$89,862,851.13	\$129,143,570.85	\$127,408,309.10	(\$131,408,364.31)	(\$82,127,644.59)	(\$83,862,906.35)
300	\$347,069,728.67	\$175,869,126.92	\$251,687,604.40	\$249,532,996.38	(\$171,200,601.75)	(\$95,382,124.27)	(\$97,536,732.29)
400	\$546,684,716.63	\$410,446,329.93	\$552,161,429.67	\$546,687,834.82	(\$236,238,366.70)	(\$94,523,286.96)	(\$99,816,881.81)
500	\$549,092,465.95	\$398,635,239.88	\$511,131,101.51	\$508,601,949.70	(\$150,257,226.09)	(\$37,961,364.44)	(\$40,490,516.25)
600	\$587,081,420.19	\$447,963,477.48	\$546,482,548.35	\$547,956,888.02	(\$139,127,942.71)	(\$40,598,871.85)	(\$39,124,532.17)
700	\$506,006,242.23	\$478,863,376.25	\$516,726,730.77	\$518,158,569.16	(\$27,142,865.98)	\$10,720,488.54	\$12,152,326.93
800	\$494,133,034.83	\$480,541,016.20	\$497,302,361.10	\$501,244,922.14	(\$13,592,018.63)	\$3,169,326.26	\$7,111,887.31
900	\$370,101,416.48	\$385,489,686.34	\$379,009,150.06	\$382,690,527.87	\$15,388,269.87	\$8,907,733.58	\$12,589,111.40
1000	\$203,065,830.97	\$235,018,757.18	\$220,609,206.42	\$221,979,702.12	\$31,952,926.21	\$17,543,375.45	\$18,913,871.15
1100	\$186,001,622.25	\$227,031,496.25	\$207,134,397.05	\$210,154,423.49	\$41,029,874.00	\$21,132,774.80	\$24,152,801.24
1200	\$176,492,775.61	\$261,067,470.35	\$214,572,898.16	\$216,503,576.94	\$84,574,694.74	\$38,080,122.55	\$40,010,801.93
1300	\$108,301,745.32	\$137,650,724.48	\$123,730,549.03	\$125,208,014.28	\$29,348,979.15	\$15,428,803.71	\$16,906,268.96
1400	\$106,662,153.70	\$147,653,503.46	\$124,148,860.99	\$125,004,270.96	\$46,971,349.76	\$23,466,807.29	\$24,322,117.26
1500	\$62,473,015.13	\$105,847,091.21	\$99,669,893.59	\$100,316,830.65	\$23,374,076.08	\$17,196,878.46	\$17,843,815.53
1600	\$33,024,667.71	\$43,517,191.54	\$38,150,205.29	\$38,612,611.26	\$10,492,323.83	\$5,125,337.58	\$5,587,743.55
1700	\$30,448,215.73	\$57,598,832.18	\$41,331,254.57	\$41,538,110.39	\$27,150,616.45	\$10,883,038.84	\$11,089,894.65
1800	\$12,804,897.83	\$22,474,784.50	\$17,496,787.52	\$17,429,323.87	\$9,669,896.67	\$4,691,889.70	\$4,624,426.04
1900	\$10,163,729.74	\$16,062,715.16	\$12,828,684.44	\$12,823,726.56	\$5,898,985.42	\$2,664,954.70	\$2,659,996.84
2000	\$132,631,496.98	\$246,610,176.94	\$179,756,366.42	\$178,047,231.72	\$113,978,679.96	\$47,124,869.44	\$45,415,734.74
Total	\$4,621,473,828	\$4,355,777,848	\$4,648,729,093	\$4,555,493,267	(\$455,695,030)	(\$172,744,836)	(\$165,980,681)

Correlation Between Usage and Income Data Shows Income Is A Poor Predictor of Usage

Common Assumption:

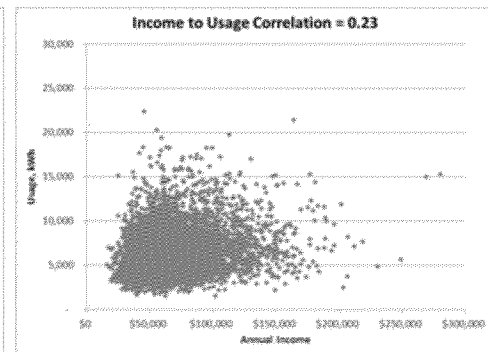
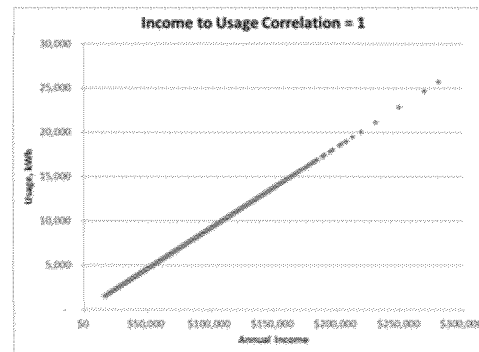
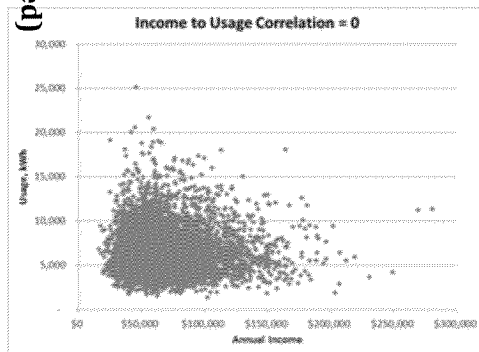
–High income households have a high usage.

Results from Data Analysis:

–Usage has poor correlation with Income.

Appendix D: "Correlation" Tab (Continued)

Area	All Customers	Non-CARE	CARE
Coast (Q, T, V)	0.26	0.23	0.15
Hills (X)	0.37	0.33	0.41
Inner Valley (S, P)	0.27	0.17	0.27
Outer Valley (R, W, Y, Z)	0.20	0.11	0.27
PG&E Territory	0.23	0.18	0.26



Note

Income data have been obtained from RASS 2009 sample. Customers who qualify for CARE program due to their income and number of households have been considered as CARE customers.

The correlation charts are illustrative only based on the assumption that income and usage are log-normally distributed.

Income versus Usage for non-CARE Households

Appendix D: "Correlation" Tab (Continued)

- Many non-CARE, low-income households have high usage*.

Income Range	Total Non-CARE Households	High Usage Non-CARE Households
30K to < 60 K	865,000	297,000 (34%)

- At the same time, many non-CARE, high-income households have low usage*.

Income Range	Total Non-CARE Households	Low Usage Non-CARE Households
100K and Above	1,063,000	435,000 (41%)

NOTE

*High usage households are defined to have Tier-3 and above usage in all 12 months of 2009. The remaining customers are defined to be Low Usage households. Customers who qualify for CARE program due to their income and number of household members been considered as CARE customers.

Lack of Correlation Causes Subsidization By Lower Income Households

- Appendix E: "Cost-Based-Rate-Drivers" Tab
- Many high-income customers pay below the cost.

Income	Annual Usage (kWh)	Annual Bill Amount	Annual Cost Based Amount	Under Payment
175,000	6,596	\$805	\$1,074	(\$269)
125,000	5,740	\$674	\$935	(\$261)
125,000	5,468	\$636	\$891	(\$254)
125,000	6,924	\$879	\$1,128	(\$249)

- At the same time, many low-income customers pay above the cost.

Income	Annual Usage (kWh)	Annual Bill Amount	Annual Cost Based Amount	Over Payment
55,000	12,675	\$2,631	\$2,065	\$567
55,000	13,988	\$3,099	\$2,279	\$821
67,500	15,384	\$3,612	\$2,506	\$1,106
45,000	15,147	\$3,717	\$2,467	\$1,250

- In 2009,

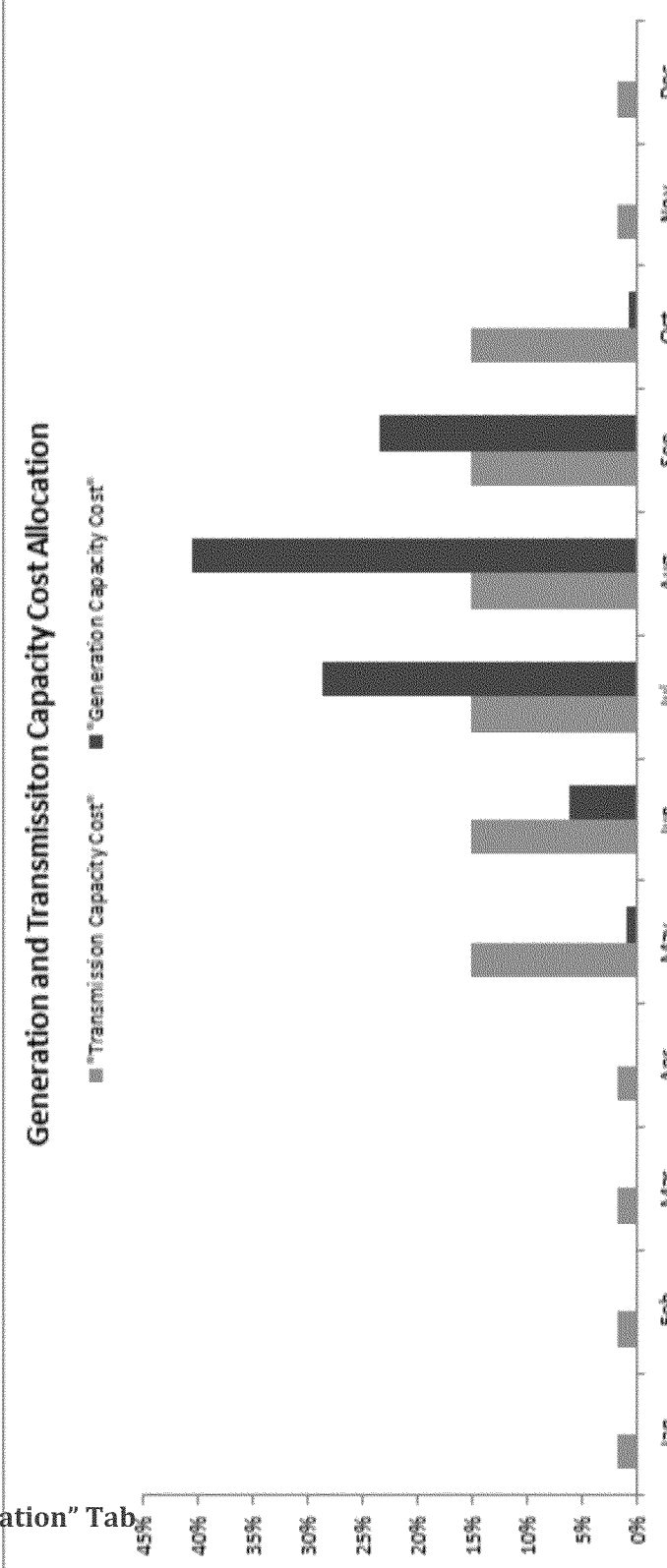
- approximately 20% of the "low income" households over paid. There are approximately 30% "low income" households.
- approximately 34% of the "high income" households have overpaid, which means that about 66% of the high income households have under-paid. There are approximately 23% "high income" households.

Note

These are basic, full service customers from climate zone "S" (Contra Costa, Yolo, Solano and San Joaquin counties). All of them are under E-1 rate schedule and do not qualify for CARE program (based on their household income and number of household members). March 1, 2009 rates have been used to calculate Annual Bill Amount. Residential average rate as of Mar 1, 2009 (\$0.16289/kWh) has been used to calculate Annual Cost Based Amount.

Cost Basis			
Cost Components	Marginal Cost	Unit	Allocation
Generation Energy	Summer, on-	5.67 Cents/kWh	Volumetric
	Summer, part-	5.21 Cents/kWh	
	Summer, Off-	3.80 Cents/kWh	
	Winter, on-peak	5.14 Cents/kWh	
	Winter, off-peak	3.94 Cents/kWh	
Generation Capacity	Annual	105.12 \$/kW-yr	Allocated to summer months. Reserve margin = 15%
Transmission Capacity	Annual	82.02 \$/kW-yr	Allocated to summer months Line Loss = 7%
Distribution Capacity	Primary	97.92 \$/kW-yr	Allocated equally to all month Line Loss = 5.3%
	Secondary	1.39 \$/kW-yr	Allocated equally to all month Line Loss = 5.3%
Customer Access Charge		156.99 \$/year	Allocated equally to all months
Other Fixed Charge		72.08 \$/year	Allocated equally to all months

Appendix F: "Energy Conservation" Tab



Illustrative Energy Conservation Estimation Using Elasticity of Usage

Energy Conservation	Current Rate	Flat Rate	TOU Rate
Usage, kWh	29,201,592,102	27,718,539,474	27,728,758,139
Conserved KWH		1,483,052,628	1,472,833,963
Percent conserved		5.08%	5.04%

Current Rate	Flat Rate		TOU Rate	
	NonCARE	CARE	NonCARE	CARE
Tier-1	0.13	0.08	0.17	0.14 Summer, on-peak
Tier-2	0.15	0.10	0.17	0.14 Summer, part-peak
Tier-3	0.30	0.12	0.17	0.14 Summer, off-peak
Tier-4	0.34	0.12	0.17	0.14 Winter, part-peak
Tier-5	0.34	0.12	0.17	0.14 Winter, off-peak

Consumption Change: Current Rate Design to Flat Rate

Non-CARE

Tier	Current Rate Based usage (kWh/yr)	Current Rate (\$/kWh)	New price (\$/kWh)	Change in price (%)	Price elasticity	Change in quantity (%)	Flat Rate usage (kWh/yr)	Change in usage (kWh/yr)
1	11,594,349,035	\$0.12845	\$0.17249	34.3%	-0.20	-6.9%	10,799,277,544	(795,071,491)
2	2,201,122,820	\$0.14602	\$0.17249	18.1%	-0.20	-3.6%	2,121,315,356	(79,807,464)
3	2,919,122,559	\$0.29561	\$0.17249	-41.6%	-0.20	8.3%	3,162,279,050	243,156,491
4	1,471,201,221	\$0.33561	\$0.17249	-48.6%	-0.20	9.7%	1,614,212,374	143,011,153
5	790,674,474	\$0.33561	\$0.17249	-48.6%	-0.20	9.7%	867,533,619	76,859,145
Total	18,976,470,109					-2.17%	18,564,617,943	(411,852,166)

CARE

Tier	Current usage (kWh/yr)	2020 IBR Rate (\$/kWh)	New price (\$/kWh)	Change in price (%)	Price elasticity	Change in quantity (%)	New usage (kWh/yr)	Change in usage (kWh/yr)
1	7,049,827,972	\$0.08316	\$0.13799	65.9%	-0.20	-13.2%	6,120,136,608	(929,691,364)
2	1,099,283,281	\$0.09563	\$0.13799	44.3%	-0.20	-8.9%	1,001,888,488	(97,394,793)
3	2,076,010,741	\$0.12474	\$0.13799	10.6%	-0.20	-2.1%	2,031,896,435	(44,114,306)
Total	10,225,121,993					-10.48%	9,153,921,531	(1,071,200,462)

Appendix F: Tab: Energy Conservation (Continued)

Consumption Change: Flat Rate to TOU Rate

Non-CARE									
Summer									
	Hours per season	Customer usage per season (kWh/season)	Customer usage per hour (kWh/hour)	Old Rate (\$/kWh)	New Rate (\$/kWh)	Consumption Change (%)	New Customer usage per season (kWh/season)	Change in (kWh/se	
Peak	768	1,948,321,751	2,536,877	\$0.17249	\$0.318212	-10.82%	1,737,484,090	(210	
Partial-Peak	958	2,300,488,976	2,401,345	\$0.17249	\$0.212141	-3.29%	2,224,838,882	(75	
Off-Peak	2,690	4,878,929,268	1,813,728	\$0.17249	\$0.141427	4.88%	5,117,067,940	238	
Total	4,416	9,127,739,994					9,079,390,912	(48	
Winter									
	Hours per season	Customer usage per season (kWh/season)	Customer usage per hour (kWh/hour)	Old Rate (\$/kWh)	New Rate (\$/kWh)	Consumption Change (%)	New Customer usage per season (kWh/season)	Change in (kWh/se	
Partial-Peak	381	1,083,752,336	2,844,494	\$0.17249	\$0.14850	0.60%	1,090,264,443	6	
Off-Peak	3,963	8,353,125,613	2,107,778	\$0.17249	\$0.14850	0.60%	8,403,318,310	50	
Total	4,344	9,436,877,948					9,493,582,753	56	
CARE									
Summer									
	Hours per season	Customer usage per season (kWh/season)	Customer usage per hour (kWh/hour)	Old Rate (\$/kWh)	New Rate (\$/kWh)	Consumption Change (%)	New Customer usage per season (kWh/season)	Change in (kWh/se	
Peak	768	1,018,899,811	1,326,692	\$0.13799	\$0.25457	-10.78%	909,082,897	(109	
Partial-Peak	958	1,182,579,873	1,234,426	\$0.13799	\$0.16971	-3.24%	1,144,249,524	(38	
Off-Peak	2,690	2,498,909,481	928,963	\$0.13799	\$0.11314	4.93%	2,622,159,069	123	
Total	4,416	4,700,389,165					4,675,491,490	(24	
Winter									
	Hours per season	Customer usage per season (kWh/season)	Customer usage per hour (kWh/hour)	Old Rate (\$/kWh)	New Rate (\$/kWh)	Consumption Change (%)	New Customer usage per season (kWh/season)	Change in (kWh/se	
Partial-Peak	381	507,539,896	1,332,126	\$0.13799	\$0.11880	0.60%	510,589,629	3	
Off-Peak	3,963	3,945,992,470	995,708	\$0.13799	\$0.11880	0.60%	3,969,703,356	23	
Total	4,344	4,453,532,367					4,480,292,984	26	

Notes:

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