Pacific Gas and Electric Company

Residential Rate OIR Rate Design and Bill Impact Analysis Model

User Guide

Version 2.0 12/21/2012

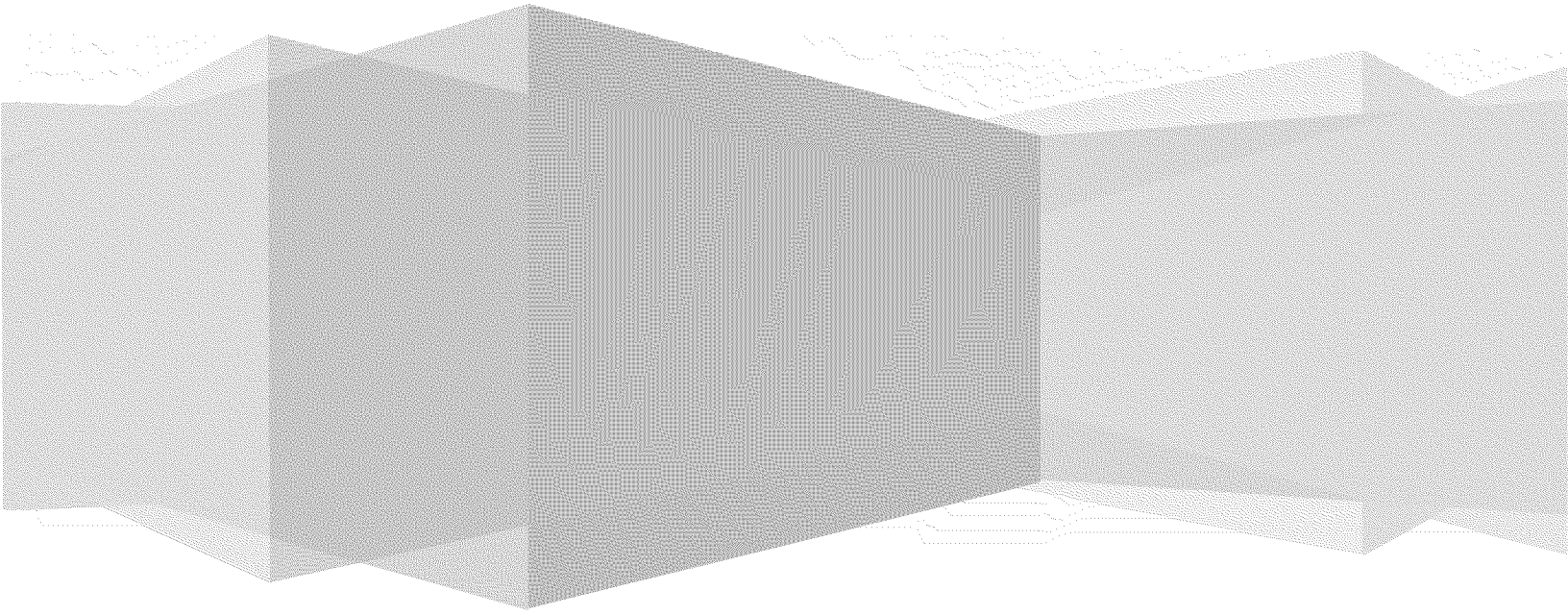

Table of Contents

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User Guide

Overview

The 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. Specifically, the rate scenarios that may be evaluated in this tool includes:

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

Once 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 ignored.

[1] TOU – Time of Use

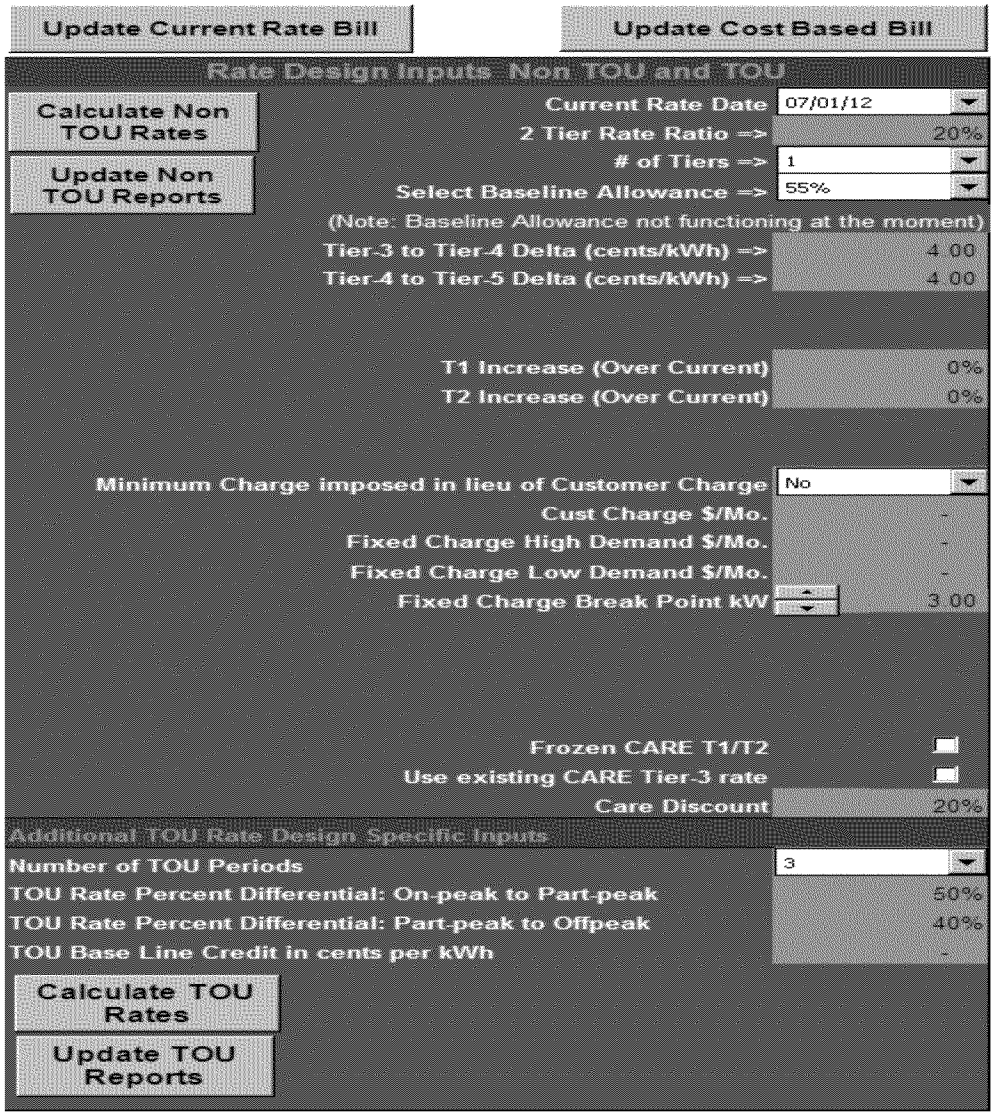


Figure 1

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-3 to Tier-4 Delta (cents/kWh[2])* – The absolute cent-per-kWh differential that is applied to rate tiers 3 and 4 when the number of tiers specified in the "# of Tiers" dropdown box is greater than three.
- *Tier-4 to Tier-5 Delta (cents/kWh[3])* – The absolute cent-per-kWh differential that is applied to rate tiers 4 and 5 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 per kWh x 40 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 per kWh x 41 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).
- *Frozen CARE[4] 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

- *Number of TOU Periods* – User can choose either two or three TOU periods. If three

[2] Kilowatt Hour
[3] Kilowatt Hour
[4] CARE - California Alternative Rates for Energy

TOU period is chosen, then the TOU period is defined as on-peak, part-peak and off-peak based on PG&E's existing E-6 rate schedule. If two TOU period is chosen, then the model will treat the part-peak period and the off-peak period together as the off-peak period.

- *TOU Rate Percentage Differential: On-Peak; Partial-Peak* – The percentage rate differential that is applied to on-peak and part-peak rates. For example, assuming a 50 percent differential, the on-peak rate would be 50 percent higher than the part-peak rate.
- *TOU Rate Percentage Differential: Partial-Peak, Off-Peak* – The percentage rate differential that is applied to part-peak and off-peak rates.. For example, assuming a 40 percent differential, the part-peak rate would be 40 percent higher than the off-peak rate. If two TOU period based rate design is intended, then this ratio is set to 1 internally by the model.
- *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 - Update Current Rate Bill – Click on "Update Current Rate Bill" button located above the Inputs area of the tab after selecting the current rate date, and updating the inputs in the "Detailed Inputs" tab.

Step 2 – Update Cost Based Bill - Click on "Update Cost Based Bill" button located above the Inputs area of the tab after updating customer data in "Customer Data" tab, and the inputs in the "Detailed Inputs" tab.

Step 3 - Calculate TOU Rates - Click on the "Calculate TOU Rates" button located in the Inputs area after providing the inputs in this ("Summary") tab.

Step 4 - Calculate Non-TOU Rates – Click on the "Calculate Non-TOU Rates" button located in the Inputs area after providing the inputs in this ("Summary") tab..

Step 5 - 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 6 - 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.

Rate Summary Tables

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

1) *Resulting Non-TOU Residential Rates* (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

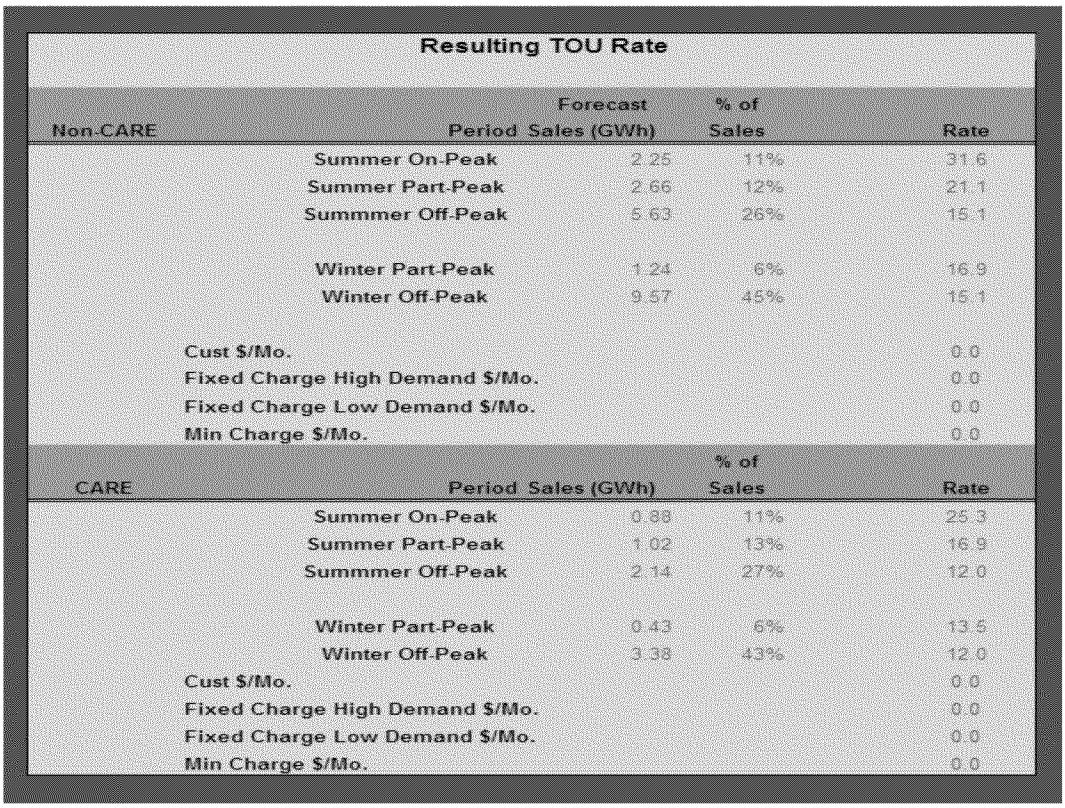
Non-CARE	Tier	Forecast Sales (GWh)	% of Sales	Jul-12 Rate	Flat Rate Rate
	1	13.23	62%	12.8	17.6
	2	2.45	11%	14.6	17.6
	3	3.22	15%	29.6	17.6
	4	1.59	7%	33.6	17.6
	5	0.85	5%	33.6	17.6
	Cust $/Mo.			0.0	0.0
	Fixed Charge High Demand $/Mo.			0.0	0.0
	Fixed Charge Low Demand $/Mo.			0.0	0.0
	Min Charge $/Mo.			4.5	0.0
CARE	Tier	Sales (GWh)	% of Sales	Jul-12 Rate	Flat Rate Rate
	1	5.41	69%	8.3	14.1
	2	0.85	11%	9.6	14.1
	3	1.00	13%	12.5	14.1
	4	0.41	5%	12.5	14.1
	5	0.19	2%	12.5	14.1
	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.			3.6	0.0

Figure 2

2) *Resulting TOU Residential Rates* (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	Period	Forecast Sales (GWh)	% of Sales	Rate
	Summer On-Peak	2.25	11%	31.6
	Summer Part-Peak	2.66	12%	21.1
	Summmer Off-Peak	5.63	26%	15.1
	Winter Part-Peak	1.24	6%	16.9
	Winter Off-Peak	9.57	45%	15.1
	Cust $/Mo.			0.0
	Fixed Charge High Demand $/Mo.			0.0
	Fixed Charge Low Demand $/Mo.			0.0
	Min Charge $/Mo.			0.0

CARE	Period	Sales (GWh)	% of Sales	Rate
	Summer On-Peak	0.88	11%	25.3
	Summer Part-Peak	1.02	13%	16.9
	Summmer Off-Peak	2.14	27%	12.0
	Winter Part-Peak	0.43	6%	13.5
	Winter Off-Peak	3.38	43%	12.0
	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 Recovery[5]
   - Percent Fixed Cost Not Recovered[6]

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)	16.8	18.1	17.6	17.1
Hills (X)	17.0	18.0	17.6	17.4
Inner Valley (S, P)	17.4	17.8	17.6	17.8
Outer Valley (R, W, Y, Z)	17.5	17.8	17.6	18.2
Non-CARE Customers	**17.1**	**18.0**	**17.6**	**17.6**

CARE

Baseline Region	Cost Base Rate	Jul-12 Rate	Proposed Non-TOU Flat Rate	Proposed TOU Rate
Coast (Q, T, V)	16.5	9.3	14.1	13.7
Hills (X)	17.3	9.1	14.1	14.0
Inner Valley (S, P)	17.1	9.4	14.1	14.3
Outer Valley (R, W, Y, Z)	17.3	9.3	14.1	14.7
CARE Customers	**17.1**	**9.3**	**14.1**	**14.2**

Rate Design Measures	Current Rate Levels	Non-TOU Flat Rate	TOU
Residential CARE Subsidy ($M) =>	$ 627,003,686	$ 212,000,000	$ 198,000,000
Residential CARE subsidy funded by non-residential class ($M) =>	$ 438,902,580	$ 148,400,000	$ 138,600,000
Effective CARE Discount % =>	48%	20%	20%
Percent of Revenue Requirement met by Fixed Customer Charge =>	0%	0%	0%
Percent Fixed Cost Not Recovered	24%	24%	24%

Figure 4

There are two additional Rate Design Measure table similar to the Figure 4 table, that can be used to show the non-TOU and TOU rate impacts separately.

Total Usage by Climate Zone

A summary table is provided in the "Summary" tab showing total usage (GWh) for non-CARE and CARE customers by PG&E climate zone.

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

[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.

"Detailed Input" Tab – Various inputs that may be needed for rate design are provided by the user in this tab.

Basic Inputs for Calculation tab

- *% Non-Residential Usage of the Total Usage Less CARE and Streetlights* – This is normally 70% for PG&E.
- *Billions*– This is used as a common billion divisor or multiplier as necessary in the model.
- *Elasticity (Substitution, Daily)* – This input is used for energy conservation estimation. It is not used in the rate optimization.
- *Daily Elasticity for Non-CPP Days* – This input is used for energy conservation estimation. It is not used in the rate optimization.
- *Minimum Charge ($/month)*– The minimum monthly charge will be used by the model if "Minimum Charge in Lieu of Customer Charge" option is chosen in the "Summary" tab..
- *Missing Income Replacement* – User can choose the replacement of annual income for the model to estimate bill to income ratio when this data is missing.
- *Max Cust Monthly Ave Usage* – This is normally 2000 for PG&E customers.

Number of hours per time period

These inputs are used in the "Energy conservation" tab.

PRISM Models Hours by Period

These inputs are used in the "Energy conservation" tab.

Bill Impact Classification

These bill impact range inputs are used in the "PGE Bill Impact Output" tab to report the results in a desired level of granularity.

Tiered Rate for Energy Conservation Calculation ($/kWh)

These inputs are used in the "Energy conservation" tab to calculate estimate energy conservation.

Current Rates Data

These inputs are based on the respective advice letters and are used by the model to determine current rate based bill amount, and the revenue collection by various rate design scenarios. The naming of these inputs are intended to explain what these are.

Inputs (Intermediate)

- *Basic inputs* – These inputs require updating based on the sample data used in this model.
- *Seasonal TOU Price Ratios*– User can change these ratios to get a desired level of seasonal price differentiation.
- *Cost Based Revenue Requirement* – If calibration to current rate based revenue collection is desired then these inputs should be driven by respective data from "Revenue Summary" tab. Alternatively, the user can choose a different set of inputs. However, the resulting rates will not be comparable to the current rates in that case.
- *Fair Cost Rate Input ($/kWh)* – These inputs are used for cost based bill amount

calculation. The naming for these inputs are intended for explaining what these are.

- *Elasticity Based Usage Adjustment Factors* – The usage (kWh) adjustment factors can be provided as inputs for non-TOU and TOU rate designs in two tables.
- *Coincident Load Factor Averages* – These inputs are used to replace missing values.
- *Non-Coincident Load Factor Averages* – These inputs are used to replace missing values.
- *Time Of Use (TOU) kWh split by zone* – These inputs are used to replace missing values.

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
- 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

Other Tabs – There are several other tabs in this model as described below.

- Calculation tabs: There are eight calculation tabs in this model used for rate design and reporting calculations. Users are not supposed to make any changes in these tabs.
- Input Intermediate tab: This tab is hidden and is used by the model to preprocess the input data
- Load Factor Summary: The load factor summary tab contains data that are used for missing value replacement. These data were generated using a SAS program. User can choose to either use these values, or use other appropriate missing values by providing those in the "Detailed Input" tab.
- Revenue Summary: This tab has Advice Letter specific data corresponding to the current rate dates provided in the "Detailed Input" tab.

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 allocaton that is alligned with marginal cost allocation principles.

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

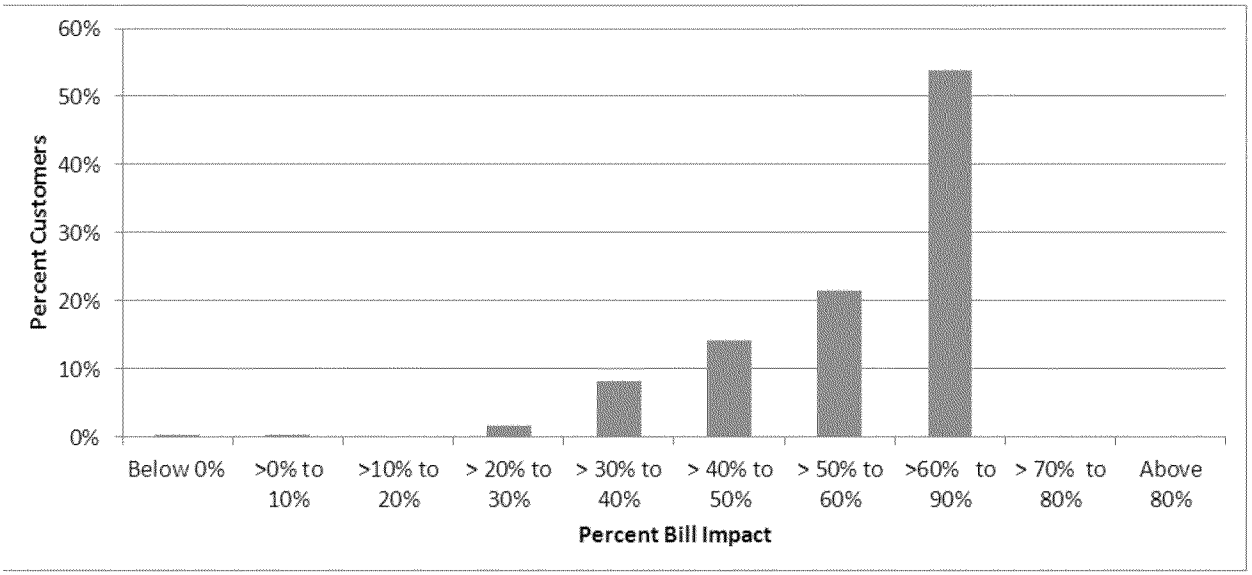
Split Demand-Based Customer Charges – Fixed monthly customer charges that vary depending on customers' levels of electric (kW) demand.

Appendix A: "PG&E Bill Impact-Output" Tab

CARE Customers

Press F9 to update charts and tables after selection.

Non TOU Flat Rate Design Impacts CARE Customers

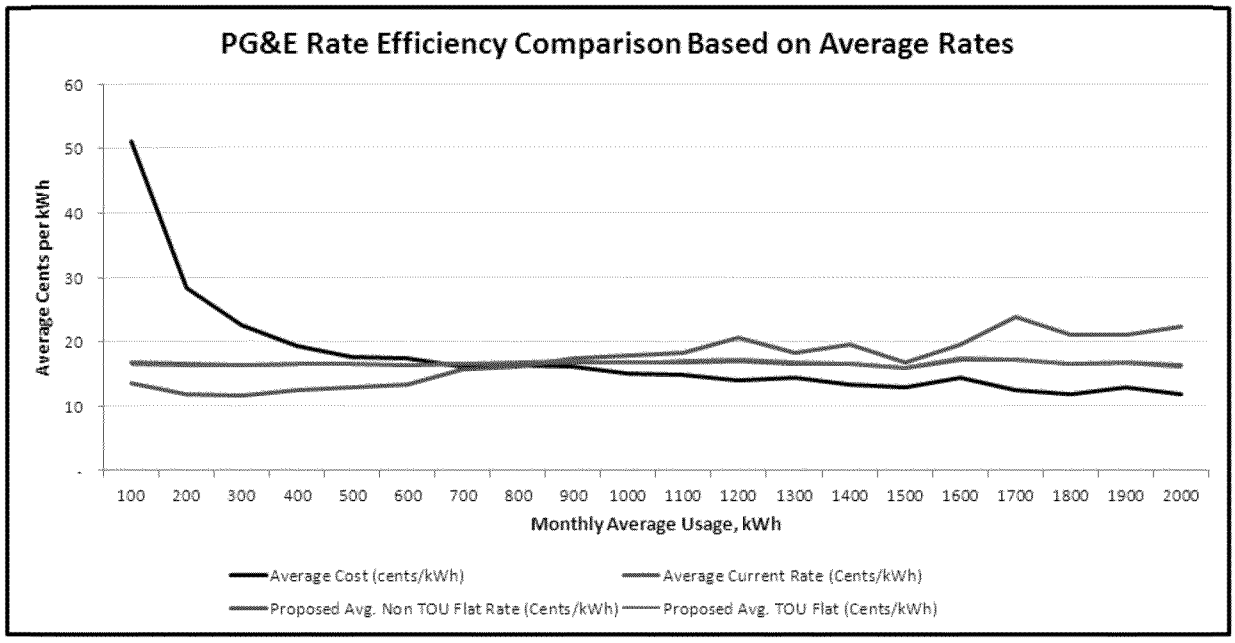


Non TOU Flat Rate Design Impacts CARE Customers

Impact	Customer		Average		Average Cents/kWh		%	Monthly $			Average Bill to Income Ratio	
Percent Range	Number	Percent	Monthly - kWh	Load Factor	Jul-12	Proposed	Change	Jul-12	Proposed	Change	Jul-12	Proposed
Below 0%	3,452	0%	3	1%	119.00	14.05	-88%	3.60	0.43	(3.17)	0.1%	0.0%
>0% to 10%	3,518	0%	26	16%	13.94	14.05	1%	3.60	3.63	0.03	0.2%	0.2%
>10% to 20%	624	0%	2,843	22%	11.76	14.05	20%	334.31	399.54	65.23	8.0%	9.6%
> 20% to 30%	20,525	2%	1,693	22%	11.27	14.05	25%	190.74	237.90	47.17	3.0%	3.7%
> 30% to 40%	103,911	8%	938	17%	10.41	14.05	35%	97.68	131.87	34.19	2.4%	3.3%
> 40% to 50%	179,548	14%	750	16%	9.69	14.05	45%	72.65	105.36	32.70	1.7%	2.5%
> 50% to 60%	272,789	22%	556	16%	9.08	14.05	55%	50.51	78.14	27.64	1.6%	2.5%
>60% to 90%	683,663	54%	343	14%	8.45	14.05	66%	28.96	48.14	19.19	1.2%	2.0%
> 70% to 80%	-	0%	-	0%	-	-	0%	-	-	-	0.0%	0.0%
Above 80%	-	0%	-	0%	-	-	0%	-	-	-	0.0%	0.0%
Group Total	1,268,031	100%	516	15%	9.31	14.05	51%	48.04	72.55	24.51	1.6%	2.4%

Similar to the non-TOU rate impact shown above, this tab has TOU rate impact results as well.

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	51.15	13.71	16.76	16.51	-73%	-67%	-68%
200	28.45	11.97	16.71	16.37	-58%	-41%	-42%
300	22.51	11.64	16.38	16.21	-48%	-27%	-28%
400	19.50	12.44	16.66	16.45	-36%	-15%	-16%
500	17.69	12.95	16.52	16.44	-27%	-7%	-7%
600	17.38	13.48	16.36	16.49	-22%	-6%	-5%
700	16.16	15.67	16.67	16.75	-3%	3%	4%
800	16.41	16.19	16.65	16.87	-1%	2%	3%
900	16.09	17.51	16.87	17.09	9%	5%	6%
1000	15.04	17.85	16.72	16.80	19%	11%	12%
1100	14.93	18.43	16.83	17.10	23%	13%	15%
1200	13.96	20.62	17.12	17.27	48%	23%	24%
1300	14.39	18.35	16.63	16.89	28%	16%	17%
1400	13.39	19.52	16.66	16.64	46%	24%	24%
1500	13.07	16.80	15.94	16.01	29%	22%	23%
1600	14.50	19.71	17.16	17.59	36%	18%	21%
1700	12.62	23.82	17.23	17.25	89%	37%	37%
1800	11.87	21.20	16.52	16.49	79%	39%	39%
1900	13.00	21.14	16.81	16.74	63%	29%	29%
2000	11.94	22.41	16.36	16.05	88%	37%	34%

There are separate charts for non-TOU and TOU rate designs as well in this tab.

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

Cost of Service vs. Current and Proposed Rate Designs							
Monthly Average Bill					Difference from Cost		
Average Monthly Usage	Average Cost	Average Current	Average Non TOU Flat Rate	Average TOU	Current	Non TOU Flat Rate	TOU
100	$32.47	$8.70	$10.64	$10.48	($23.77)	($21.83)	($21.99)
200	$43.93	$18.43	$25.74	$25.22	($25.39)	($18.09)	($18.60)
300	$56.22	$29.06	$40.90	$40.48	($27.15)	($15.31)	($15.74)
400	$66.30	$41.58	$56.34	$57.60	($24.72)	($9.96)	($8.70)
500	$78.43	$57.40	$73.24	$72.86	($21.03)	($5.19)	($5.57)
600	$95.12	$73.81	$89.65	$90.26	($21.30)	($5.60)	($4.86)
700	$104.55	$101.37	$107.81	$108.37	($3.19)	$3.26	$3.81
800	$122.56	$121.08	$124.52	$126.15	($1.48)	$1.96	$3.40
900	$136.17	$148.18	$142.75	$144.62	$12.01	$6.58	$8.45
1000	$143.40	$170.17	$159.33	$160.15	$26.77	$15.93	$16.75
1100	$155.90	$192.38	$175.76	$178.56	$36.48	$19.86	$22.66
1200	$159.33	$235.48	$195.48	$197.23	$76.09	$36.10	$37.85
1300	$180.29	$229.99	$208.35	$211.69	$49.70	$28.06	$31.40
1400	$179.85	$262.20	$223.78	$223.41	$82.35	$43.92	$43.56
1500	$190.28	$244.56	$231.99	$233.11	$54.28	$41.71	$42.83
1600	$221.55	$301.19	$262.32	$268.79	$79.64	$40.77	$47.24
1700	$205.52	$387.96	$280.65	$280.96	$182.44	$75.13	$75.44
1800	$207.12	$369.98	$288.18	$287.70	$162.86	$81.06	$80.58
1900	$240.22	$390.46	$310.53	$309.26	$150.25	$70.31	$69.04
2000	$294.90	$553.58	$403.96	$396.44	$258.68	$109.06	$101.55
Total	$90.20	$82.28	$87.53	$82.28	($7.91)	($2.67)	($7.91)

Annual Average Revenue					Difference from Cost		
Average Monthly Usage	Cost Based	Current Total	Non TOU Flat Rate Total	TOU Total	Current Total	Non TOU Flat Rate Total	TOU Total
100	$69,387,243.00	$18,594,402.13	$22,738,620.93	$22,399,544.40	($50,792,840.87)	($46,648,622.07)	($46,987,698.60)
200	$233,834,244.64	$88,376,400.03	$137,398,129.29	$134,597,404.02	($145,457,844.61)	($96,436,115.35)	($99,236,840.62)
300	$363,133,283.84	$187,736,888.60	$264,230,973.18	$261,474,507.65	($175,396,395.24)	($98,902,310.65)	($101,658,776.19)
400	$672,490,992.99	$429,092,426.63	$574,407,020.28	$567,122,052.45	($243,398,566.36)	($98,083,972.70)	($105,368,940.45)
500	$568,400,293.52	$415,988,566.07	$530,785,555.22	$528,034,143.50	($152,411,727.44)	($37,614,738.29)	($40,366,150.02)
600	$801,964,879.36	$466,862,557.31	$666,941,260.94	$671,097,824.48	($335,102,321.65)	($135,023,618.03)	($130,867,054.49)
700	$520,333,818.82	$504,467,850.55	$536,546,338.99	$539,309,255.53	($15,865,968.27)	$16,212,520.17	$18,975,436.71
800	$908,008,921.02	$398,568,832.33	$512,733,082.77	$519,420,749.67	($395,440,088.69)	($195,275,838.25)	($388,588,171.35)
900	$376,341,553.82	$409,531,012.41	$394,536,902.06	$399,694,298.93	$33,189,458.59	$18,195,348.24	$23,352,745.10
1000	$206,286,181.88	$244,000,075.09	$229,201,209.50	$230,395,197.23	$38,513,893.20	$22,915,027.62	$24,099,015.34
1100	$188,871,319.48	$233,068,589.43	$212,933,400.30	$216,328,911.16	$44,197,269.95	$24,062,080.81	$27,457,591.68
1200	$179,040,976.34	$264,519,382.79	$219,581,135.79	$221,556,379.47	$85,478,376.45	$40,540,159.35	$42,515,403.12
1300	$109,665,532.50	$139,899,503.69	$126,734,212.32	$128,765,772.93	$30,233,971.19	$17,068,679.82	$19,100,240.43
1400	$101,824,355.27	$148,446,522.64	$126,692,234.94	$126,464,182.12	$46,622,167.36	$24,867,879.66	$24,639,826.84
1500	$83,541,287.62	$107,373,199.04	$101,855,353.11	$102,345,290.50	$23,831,911.43	$18,314,065.50	$18,804,002.88
1600	$33,341,009.25	$45,320,784.76	$38,476,585.07	$40,450,658.45	$11,979,775.50	$5,135,575.82	$7,109,649.20
1700	$30,953,570.13	$58,431,475.72	$42,268,745.29	$42,315,118.15	$27,477,905.59	$11,315,175.15	$11,361,548.02
1800	$13,966,154.28	$23,161,717.65	$18,940,864.67	$19,011,124.43	$9,195,563.36	$4,974,710.38	$5,044,970.20
1900	$10,245,123.75	$16,653,010.23	$13,243,721.76	$13,189,572.24	$6,407,886.48	$2,998,598.01	$2,944,448.49
2000	$134,476,181.41	$252,435,894.73	$184,207,696.28	$180,782,326.56	$117,959,693.23	$49,731,494.82	$46,306,165.72
Total	$4,961,403,151	$4,527,486,254	$4,814,750,860	$4,824,198,940	($433,916,898)	($146,652,292)	($137,204,211)

Appendix D: "Correlation" Tab

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.

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.

Appendix D: "Correlation" Tab (Continued)

Income versus Usage for non-CARE Households

- 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 defi
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.

Appendix E: "Cost-Based-Rate-Drivers" Tab

Lack of Correlation Causes Subsidization By Lower Income Households

•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

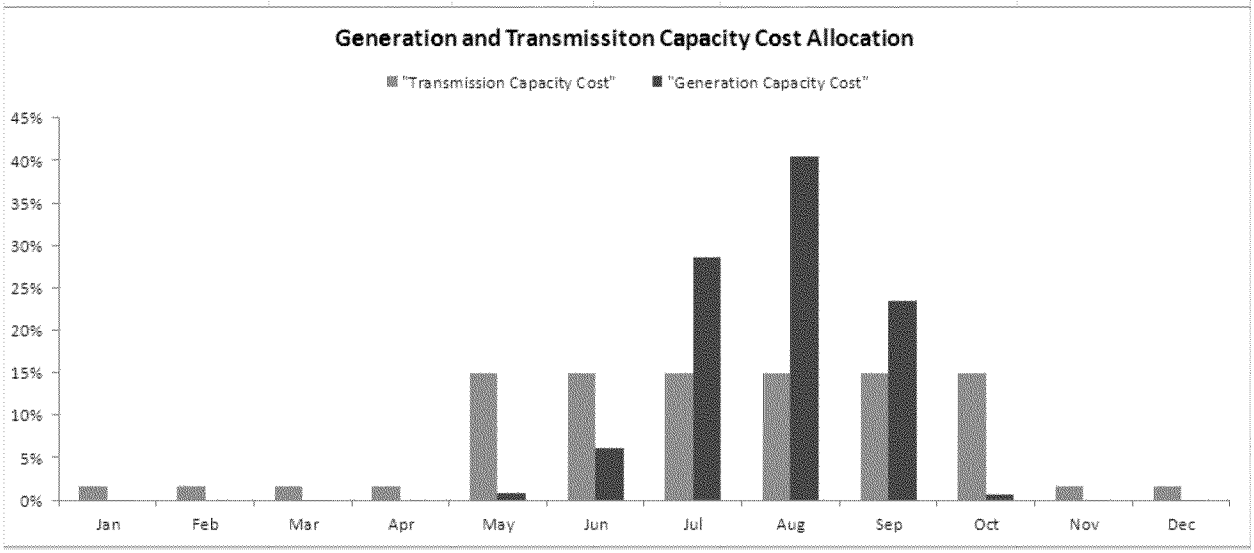
•In 2009,

- •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	Other
Generation Energy Charge	Summer, on-peak	5.89	Cents/kWh	Volumetric	
	Summer, part-peak	5.41	Cents/kWh		
	Summer, Off-peak	3.95	Cents/kWh		
	Winter, on-peak	5.35	Cents/kWh		
	Winter, off-peak	4.09	Cents/kWh		
Generation Capacity Cost	Annual	109.32	$/kW-yr	Allocated to summer months.	Reserve margin = 15%
Transmission Capacity Cost	Annual	71.13	$/kW-yr	Allocated to summer months	Line Loss = 7%
Distribution Capacity Cost	Primary	96.43	$/kW-yr	Allocated equally to all months	Line Loss = 5.3%
	Secondary	1.37	$/kW-yr	Allocated equally to all months	Line Loss = 5.3%
Customer Access Charge		154.60	$/year	Allocated equally to all months	
Other Fixed Charge		103.71	$/year	Allocated equally to all months	



Appendix F: "Energy Conservation" Tab

Illustrative Energy Conservation Estimation Using Elasticity of Usage

The results below are based on 100% volumetric rate designs

Energy Conservation	Current Rate	Flat Rate	TOU Rate
Usage , kWh	29,201,592,102	27,755,749,871	27,759,897,422
Conserved kWh		1,445,842,232	1,441,694,680
Percent conserved		4.95%	4.94%

5-Tiered Rates	Flat Rate		TOU Rate				
	NonCARE	CARE	NonCARE	CARE		NonCARE	CARE
Tier-1	$0.12845	$0.08316	$0.17568	$0.14054	Summer, on-peak	$0.31609	$0.25287
Tier-2	$0.14602	$0.09563	$0.17568	$0.14054	Summer, part-peak	$0.21073	$0.16858
Tier-3	$0.29561	$0.12474	$0.17568	$0.14054	Summer, off-peak	$0.15052	$0.12042
Tier-4	$0.33561	$0.12474	$0.17568	$0.14054	Winter, part-peak	$0.16858	$0.13487
Tier-5	$0.33561	$0.12474	$0.17568	$0.14054	Winter, off-peak	$0.15052	$0.12042

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	13,233,792,276	$0.12845	$0.17568	36.8%	-0.20	-7.4%	12,260,620,935	(973,171,341)
2	2,454,588,914	$0.14602	$0.17568	20.3%	-0.20	-4.1%	2,354,875,521	(99,713,394)
3	3,219,633,696	$0.29561	$0.17568	-40.6%	-0.20	8.1%	3,480,879,096	261,245,399
4	1,592,558,742	$0.33561	$0.17568	-47.7%	-0.20	9.5%	1,744,341,734	151,782,992
5	846,108,407	$0.33561	$0.17568	-47.7%	-0.20	9.5%	926,748,991	80,640,583
Total	21,346,682,036					-2.71%	20,767,466,276	(579,215,761)

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	5,410,384,731	$0.08316	$0.14054	69.0%	-0.20	-13.8%	4,663,714,797	(746,669,934)
2	845,817,186	$0.09563	$0.14054	47.0%	-0.20	-9.4%	766,368,513	(79,448,673)
3	1,598,708,149	$0.12474	$0.14054	12.7%	-0.20	-2.5%	1,558,200,285	(40,507,864)
Total	7,854,910,066					-11.03%	6,988,283,595	(866,626,471)

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 usage (kWh/season)
Peak	924	2,188,205,954	2,849,227	$0.17568	$0.316090	-10.14%	1,966,425,975	(221,779,979)
Partial-Peak	924	2,583,548,119	2,696,814	$0.17568	$0.210727	-2.54%	2,517,817,302	(65,730,817)
Off-Peak	2,568	5,481,096,765	2,037,582	$0.17568	$0.150519	4.24%	5,713,480,313	232,383,547
Total	4,416	10,252,850,838					10,197,723,589	(55,127,249)

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 usage (kWh/season)
Partial-Peak	924	1,207,355,706	3,168,913	$0.17568	$0.16858	-1.43%	1,190,030,425	(17,325,281)
Off-Peak	3,420	9,307,259,731	2,348,539	$0.17568	$0.15052	0.82%	9,384,005,728	76,745,996
Total	4,344	10,514,615,438					10,574,036,153	59,420,715

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 usage (kWh/season)
Peak	768	783,391,621	1,020,041	$0.14054	$0.25287	-10.08%	704,425,402	(78,966,219)
Partial-Peak	768	904,713,461	944,377	$0.14054	$0.16858	-2.48%	882,237,250	(22,476,211)
Off-Peak	2,880	1,907,821,031	709,227	$0.14054	$0.12042	4.30%	1,989,928,983	82,107,952
Total	4,416	3,595,926,113					3,576,591,635	(19,334,477)

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 usage (kWh/season)
Partial-Peak	768	385,856,433	1,012,747	$0.14054	$0.13487	-1.44%	380,312,173	(5,544,260)
Off-Peak	2,880	3,006,501,049	758,643	$0.14054	$0.12042	0.82%	3,031,233,871	24,732,823
Total	4,344	3,392,357,482					3,411,546,044	19,188,562

Notes: