

**San Diego Gas & Electric Company**

**GRC Phase 2 A.07-01-047  
Electric Class Split Study**

**August 1, 2008**

## **I. Overview**

San Diego Gas & Electric Company (SDG&E) filed an application (A.07-01-047) on January 31, 2007 which addressed electric marginal costs, allocation, and rate design. The proceeding was identified as SDG&E's General Rate Case (GRC) Phase 2 proceeding.

SDG&E filed an all-party settlement (Settlement) on November 1, 2007 which was adopted in its entirety by the California Public Utilities Commission (Commission) in Decision (D.)07-02-024 dated February 28, 2008. One of the items agreed to in the adopted Settlement was an analysis of splitting the commercial and industrial customer class into three levels based on kW demands ("Class Split Study"). This Class Split Study is intended to satisfy the requirements of the Settlement. The specific description of the study from the Settlement was as follows:

"SDG&E shall analyze the impact of splitting Commercial and Industrial (C&I) Customers into 3 classes, specifically 20kw to 200kw, 200kw to 500kw, and over 500kw (Class Split Study). SDG&E shall complete the Class Split Study by August 1, 2008, and upon completion of the study shall immediately convene a meeting to review the results of the study with the Customers." (Ref. Settlement at Section II.8, at page 6)

SDG&E's current Medium and Large C&I customer class includes all customers with demands of 20kW and greater. To comply with the Settlement study requirement SDG&E has developed separate load shapes, allocation determinants, and billing determinants for three C&I customer classes:

- Customers with maximum annual demands of 20kW to 200 kW;
- Customers with maximum annual demands of 200 kW to 500 kW; and
- Customers with maximum annual demands in excess of 500 kW.

To develop these load shapes, SDG&E used 2005 billing data and the entire population of SDG&E customers in order to summarize the on-peak, off-peak and semi-peak consumption for each of the three sub-classes. The total on-peak, semi-peak and off-peak usage for each rate schedule for each service voltage level is equal to the 2008 consumption adopted in SDG&E's GRC phase II. The 2005 billing data was used to estimate the percentage of the load that falls within the three sub-classes: (1) less than 200 kW sub-class, (2) the 200-500 kW sub-class, (3) and the greater than 500 kW sub-class. The billing data for the entire SDG&E customer population was also used to calculate the customer-diversified load factor.

Interval data from 2005 was used to estimate usage on CPP days, to develop the load factor coincident with system peak and for the class peak, and to develop hourly loads for each sub-class during the top-300 hours. All billable customers with an interval meter who were enrolled on the affected rate schedules in 2005 were used in the analysis. An hourly annual load shape was estimated for each of the sub-classes. The analysis was performed using all customers and then again using just bundled customers. The interval data analysis was performed using standard load research methods, using a weighted stratified sample and ratio estimation to estimate the hourly total load for each split. The data for each sub-class was estimated for one year by adjusting the final load factors proportionally to ensure that the total demand from the sum of the three sub-classes added up to the total demand for the combined rate class calculated using the ten-year average load factors used in SDG&E's GRC phase II proceeding.

SDG&E used this load shape and determinate data to develop three distinct revenue allocations for the rate categories of Distribution and Commodity. Overall revenue requirements are unchanged from currently-effective levels in this Class Split Study.<sup>1</sup>

- Section II describes the customer bill impact analysis assumptions and results.
- Section III describes revenue allocation methodologies and results.
- Section IV describes rate design results and presents comparisons.

Allocations and rate designs for other major rate categories are unchanged. Therefore revenue allocations and rates are unchanged for: Transmission, Reliability Services (RS), Nuclear Decommissioning (ND), Public Purpose Programs (PPP), Competition Transmission Charges (CTC), and the California Department of Water Resources (DWR) Bond Charge.

As described in Section III., overall distribution and commodity allocations continue to utilize the settlement EPMC factors. The three sub-classes are assigned specific Distribution and Commodity revenue requirements using the allocation factors shown in Attachments B-3 and B-4. Distribution and commodity rates are then designed to collect the allocated revenue requirements.

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<sup>1</sup> Revenue requirements referred to in this Class Split Study are based on currently-effective rates which became effective June 1, 2008 based on Advice Letter 1994-E.

The following table summarizes average rate results.

**Table 1**

<b>Class-Average Distribution Rates (\$/kWh)</b>				
<b>Class</b>	<b>Present Class</b>		<b>Class Split Study</b>	
	<b>\$/kWh</b>	<b>% of Class Avg</b>	<b>\$/kWh</b>	<b>% of Class Avg</b>
<b>20-200 kW</b>	0.032	129%	0.034	134%
<b>200-500 kW</b>	0.026	103%	0.024	96%
<b>&gt; 500 kW</b>	0.019	76%	0.019	76%
<b>Combined</b>	0.025	100%	0.025	100%
<b>Class-Average Commodity Rates (\$/kWh)</b>				
<b>Class</b>	<b>Present Class</b>		<b>Class Split Study</b>	
	<b>\$/kWh</b>	<b>% of Class Avg</b>	<b>\$/kWh</b>	<b>% of Class Avg</b>
<b>20-200 kW</b>	0.093	101%	0.091	99%
<b>200-500 kW</b>	0.093	101%	0.095	103%
<b>&gt; 500 kW</b>	0.090	98%	0.092	99%
<b>Combined</b>	0.092	100%	0.092	100%

As shown in Table 1, splitting the current Medium & Large C&I class into three sub-classes had little impact on the average rates for either Distribution or Commodity components. Since the current rate structures for Distribution and Commodity incorporate a demand /energy structure, higher load factor customers already benefit from average rates that are lower than the class-average. Splitting the single class into three sub-classes, and assigning specific revenue requirements to the sub-classes based on marginal cost estimates, therefore had little impact on class-average average rates. Customer-specific bill impacts will tend to have more variation and are described in Section II of this study.

## II. Customer Bill Impact Analysis Assumptions and Results

For the purposes of analyzing the impacts on customer bills, two different types of bill impacts were performed.

### A. Type 1 – Effects On All Time-of-Use Accounts

This study considered all active SDG&E accounts on AD, A6-TOU, AL-TOU, AY-TOU and PA-T-1 rate schedules. Using monthly historical data at a premise and service point, all accounts with twelve months of data from October 2006 through September 2007 were included. Accounts were then divided into the three sub-classes, based on the account's maximum demand over the year. The number of accounts under the three sub-classes are identified in Table 2 below:

**Table 2**

< 200 kW	18,820 accounts
200 kW – 500 kW	1,962 accounts
> 500 kW	824 accounts

#### 1. Rates Used

Rates effective June 1, 2008 were used for the present case and Illustrative Proposed Rates were used on the proposed side.

#### 2. Accounts Used

Bill impacts were developed for both bundled and direct access accounts first for all schedules and then for each of the rate schedules identified above. The specific groups and their corresponding attachments are identified in Table 3 below.

### 3. Exceptions

The EECC commodity rate was applied to all bundled accounts, regardless of what actual commodity rate (Voluntary CPP, Default CPP, and Emergency CPP) actually applied. There was one AD account that should have been billed in the > 500 kW class, but due to the fact that there were no rates for AD > 500 kW, this accounts was moved to the 200 – 500 kW class for the purposes of this study.

### 4. Billing Components Affected

The only changes made to the rates were in the UDC distribution component and the commodity component. Since direct access customers do not pay commodity charges to SDG&E, that analyses will only reflect a change to the distribution component.

**Table 3: Type 1 Bill Impacts**

<b>Attachment #</b>	<b>Class</b>	<b>Provider</b>	<b>Rate</b>
A-1	< 200 kW	D/A	All Schedules
A-2	< 200 kW	D/A	PA-T-1
A-3	< 200 kW	D/A	AY-TOU
A-4	< 200 kW	D/A	AL-TOU
A-5	< 200 kW	D/A	AD
A-6	< 200 kW	Bundled	All Schedules
A-7	< 200 kW	Bundled	PA-T-1
A-8	< 200 kW	Bundled	AY-TOU
A-9	< 200 kW	Bundled	AL-TOU
A-10	< 200 kW	Bundled	AD
A-11	200 – 500 kW	D/A	All Schedules
A-12	200 – 500 kW	D/A	PA-T-1
A-13	200 – 500 kW	D/A	AY-TOU
A-14	200 – 500 kW	D/A	AL-TOU
A-15	200 – 500 kW	Bundled	All Schedules
A-16	200 – 500 kW	Bundled	PA-T-1
A-17	200 – 500 kW	Bundled	AY-TOU
A-18	200 – 500 kW	Bundled	AL-TOU

A-19	200 – 500 kW	Bundled	AD
A-20	> 500 kW	D/A	All Schedules
A-21	> 500 kW	D/A	PA-T-1
A-22	> 500 kW	D/A	AL-TOU
A-23	> 500 kW	D/A	A6-TOU
A-24	> 500 kW	Bundled	All Schedules
A-25	> 500 kW	Bundled	PA-T-1
A-26	> 500 kW	Bundled	AL-TOU
A-27	> 500 kW	Bundled	A6-TOU

#### B. Type 2 – Effects on Accounts Under Default CPP

This study looked at all active SDG&E accounts on AD, A6-TOU, AL-TOU, AY-TOU and PA-T-1 rate schedules. Using 15-minute historical interval data at a premise and service point, all accounts with twelve months of interval data from October 2006 through September 2007 were included. Accounts were then divided into the three sub-classes, based on the account’s maximum demand over the year. The number of accounts under the three sub-classes are identified in Table 4 below:

**Table 4**

< 200 kW	85 accounts
200 kW – 500 kW	354 accounts
> 500 kW	266 accounts

#### 5. Rates Used

Rates effective June 1, 2008 were used for the present case and Illustrative Proposed Rates were used on the proposed side.

#### 6. Accounts Used



Bill impacts were developed only for bundled accounts currently billed on default Critical Peak Pricing commodity rate, first for the overall group and then for each rate schedule. The specific groups and their corresponding attachments are identified in Table 5 below.

7. Exceptions

This study has a limited number of accounts in it due to the fact that only those accounts currently signed up for default Critical Peak Pricing were used. The number of accounts were further diminished due to the fact that only some of these accounts had a full year of interval data for the time period specified.

8. Billing Components Affected

The only changes made to the rates were in the UDC distribution component and the commodity component.

9. Default Critical Peak Pricing Assumptions

Both the present and proposed rates assumed nine (9) Critical Peak Pricing events and the capacity reservation amount was based on 50% of the accounts maximum summer on-peak demand. Critical Peak Pricing days were selected based on the top nine (9) SDG&E system peak days (on non-holiday and non-weekends).

**Table 5: Type 2 Bill Impacts**

<b>Attachment #</b>	<b>Class</b>	<b>Provider</b>	<b>Rate</b>
A-28	< 200 kW	Bundled	All Schedules
A-29	< 200 kW	Bundled	AY-TOU
A-30	< 200 kW	Bundled	AL-TOU
A-31	200 – 500 kW	Bundled	All Schedules
A-32	200 – 500 kW	Bundled	AY-TOU
A-33	200 – 500 kW	Bundled	AL-TOU

A-34	> 500 kW	Bundled	All Schedules
A-35	> 500 kW	Bundled	PA-T-1
A-36	> 500 kW	Bundled	AL-TOU
A-37	> 500 kW	Bundled	A6-TOU

### III. Revenue Allocation Assumptions and Results

#### A. Overview

The purpose of the intraclass revenue allocation is to disaggregate the settled authorized revenue requirements of Commodity and Distribution revenue requirements to customers served in the 20-200kW, 201-500kW, and Greater than 500 kW sub-classes. The authorized Distribution Revenue and Commodity Revenue of the other SDG&E classes of service have not been changed from the settled values. The only change has been to split this one class revenue requirement to the three sub-classes.

The Settled revenue allocation was the result of negotiation among the parties to the GRC Phase 2 proceeding. As such, no explicit marginal costs, with the exception being the cost of a combustion turbine, was advocated in the Settlement document, nor subsequently adopted by the Commission in the GRC Phase 2 Decision. However, the SDG&E proposed marginal costs are implicit in the actual rates that support the settled revenue requirements for both distribution and commodity components. Thus to keep the revenue at proposed rates on the same basis as revenue at present rates, the proposed SDG&E marginal costs are used as a basis for this intraclass revenue allocation to sub-classes.

The final intraclass revenue allocation to the sub-classes is provided as percentage allocation to subclasses which sums to 100 percent. These percentage allocators are derived separately for Settled Distribution and the Commodity Revenue Requirements.

Attachment B-1 provides the results of Present and Proposed Revenue Allocation for all customer classes and all revenue requirement components. This table shows the disaggregation of the Medium & Large Commercial class into the three sub-classes and the subsequent revenue allocations for each component of revenue. Neither other rate classes nor their revenue requirement components are affected. Total Revenues shown in Column (L) are unchanged except for the Class Split Study allocation classes.

Attachment B-2 shows average rates per kWh by category, for each major customer class, under the Currently Effective and Class Split Study allocation classes. As shown in Attachment B-2 average revenue per kWh is unchanged for all categories except Distribution and Commodity. Total Average Revenue per kWh, shown in Column (L) is unchanged except for the Class Split Study allocation classes.

Attachment B-3 provides the details of the intraclass Commodity revenue allocation to the sub-classes of the Medium & Large Commercial class. This table shows the marginal cost revenue for the capacity and the energy components, the EPMC scale factor to reconcile to the revenue requirement, and the resulting sub-class allocation percentages.

Attachment B-4 provides the similar details of the Distribution revenue allocation to sub-classes, with the resulting sub-class allocation percentages.

## B. Methodology

The calculation methodology used was to run each of the three sub-class marginal costs and determinants through the existing SDG&E GRC Phase 2 workpapers marginal cost and allocation models, and thus develop the appropriate subclass marginal cost revenue. These three sub-class marginal costs were then scaled using Equal Percentage of Marginal Costs (EPMC) to reconcile to the Settled Revenue Requirements. This methodology was applied independently to both the Settled Distribution and Commodity Revenue Requirements.

The rate schedule commodity energy and demand rates were also calculated for each of the three sub-classes. The detailed rates that were used as inputs to the Rates Model are described in Section IV.

## C. Commodity Capacity Marginal Cost Revenue Calculations

The 8760 hourly load data for the calendar year 2005 was provided by Load Research for each of the rate schedules in each of the sub-classes. The data was then sorted in ascending order based on total system hourly load. The top 300 hours were then used in the Top 300 Hour methodology as proposed in the GRC Phase 2 workpapers model. The methodology of this model, in essence, develops an allocation of the settled combustion turbine capacity cost to each of the TOU periods for each schedule by sub-class.

These detailed marginal capacity costs are then applied to the GRC Phase 2 allocation determinants disaggregated to sub-classes to develop the marginal commodity demand cost revenues shown in Table B-2. The marginal cost based demand rates for each schedule and sub-class were also derived. The models used, the details of the inputs/outputs, and the schedule demand rates are provided in the workpapers.

#### D. Commodity Energy Marginal Cost Revenue Calculations

In the GRC Phase 2 marginal energy calculations, a total system marginal energy cost was derived for each hour of a typical monthly weekday day and typical monthly weekend day for the Test Year 2006. For this intraclass study split, these total system energy costs were used. Typical hourly weekday days and weekend days were constructed from the same 8760 hourly load data described above using calendar year 2005 hourly data for each rate schedule and each sub-class. Using this data, and the definitions of the schedule TOU periods, marginal energy cost rates by TOU periods for each sub-class were derived.

These TOU marginal energy cost rates were then applied to the GRC Phase 2 allocation determinants disaggregated to sub-classes to derive the marginal commodity energy cost revenues shown in Table B-2. These marginal cost energy rates for each sub-class was also derived.

The models used to calculate the marginal cost revenues, the input details, and the resulting energy rates for the sub-classes are provided in the workpapers.

#### E. Distribution Marginal Cost Revenue Calculations

The same GRC Phase 2 marginal distribution revenue allocation model was used for each of the three sub-classes to derive the sub-class distribution marginal cost revenues. This model uses the unit marginal costs for customer, feeders & local distribution, and substations, applied to the appropriate determinants to calculate the marginal cost revenue. The same unit marginal costs as in GRC Phase 2 were used and load factor determinants for each sub-class. These marginal cost revenues are shown in Table B-3.

The models used in these calculations and the input details are provided in the workpapers.

#### F. EPMC Revenue Reconciliation to the Settled Revenue Requirement

The sub-class marginal cost revenues for Commodity are shown scaled to the Settlement revenue requirement in Table B-2. The resulting Commodity percentage allocators are also shown on this table.

The sub-class marginal cost revenues are shown reconciled to the total class marginal cost revenues by marginal cost component on Table B-3. Also provided on this table are the resulting Distribution percentage allocators.

## **IV. Rate Design Assumptions and Results**

For purposes of analyzing customer bill impacts under this Class Split Study, SDG&E designed illustrative rates for each applicable C&I rate schedule. Since revenue allocations differ only for Distribution and Commodity, electric rates were redesigned for only these two major rate categories. Illustrative Proposed Distribution and Commodity rates are based on forecast billing determinants for test-year 2008 consistent with current rate design methodology. Overall, rates are designed to be revenue-neutral with currently-effective rates. That is, rate revenue for the sum of the three C&I customer classes is the same as revenue for the current single Medium & Large C&I customer class.

Illustrative Proposed Distribution rates for each rate schedule were designed using the same rate model used to design currently-effective rates. Rates for each of the three C&I sub-classes were designed separately using the class' billing determinants and revenue allocation factors described in Section III of this Class Split Study. Three sets of rate tables and rate comparisons are attached. They are identified as follows:

**20-200 kW Tables:**

Attachment C-1 - Present Unbundled Rate Table

Attachment C-2 - Proposed Unbundled Rate Table

Attachment C-3 - Distribution Present and Proposed Rate Table

Attachment C-4 - Commodity Present and Proposed Rate Table

Attachment C-5 - Total Present and Proposed Rate Table

Attachment C-6 - CPP-D Proposed Rate Table

Attachment C-7 - Customer Bill Impact Table – Schedule AL-TOU – Winter

Attachment C-8 - Customer Bill Impact Table – Schedule AL-TOU – Summer

**201-500 kW Tables:**

Attachment C-9 - Present Unbundled Rate Table

Attachment C-10 - Proposed Unbundled Rate Table

Attachment C-11 - Distribution Present and Proposed Rate Table

Attachment C-12 - Commodity Present and Proposed Rate Table

Attachment C-13 - Total Present and Proposed Rate Table

Attachment C-14 - CPP-D Proposed Rate Table

Attachment C-15 - Customer Bill Impact Table – Schedule AL-TOU – Winter

Attachment C-16 - Customer Bill Impact Table – Schedule AL-TOU – Summer

**Greater than 500 kW Tables:**

Attachment C-17 - Present Unbundled Rate Table

Attachment C-18 - Proposed Unbundled Rate Table

Attachment C-19 - Distribution Present and Proposed Rate Table

Attachment C-20 - Commodity Present and Proposed Rate Table

Attachment C-21 - Total Present and Proposed Rate Table

Attachment C-22 - CPP-D Proposed Rate Table

Attachment C-23 - Customer Bill Impact Table – Schedule AL-TOU – Winter

Attachment C-24 - Customer Bill Impact Table – Schedule AL-TOU – Summer