

Exhibit No.: SDGE-4

Proceeding No.: A. 23-01-008

Witness: William G. Saxe

Date Served: September 29, 2023

**CHAPTER 4**

**REVISED PREPARED DIRECT TESTIMONY OF**

**WILLIAM G. SAXE**

**ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY**

**BEFORE THE PUBLIC UTILITIES COMMISSION**

**OF THE STATE OF CALIFORNIA**

September 29, 2023



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1                                   **REVISED PREPARED DIRECT TESTIMONY OF**  
2                                   **WILLIAM G. SAXE**  
3                                   **(CHAPTER 4)**

4 **I.       OVERVIEW AND PURPOSE**

5                   The purpose of my revised prepared direct testimony is to present San Diego Gas &  
6 Electric Company’s (SDG&E) updated marginal distribution demand and marginal distribution  
7 customer costs, and the resulting electric allocation of distribution revenues to customer classes  
8 based on these marginal distribution costs.

9                   My testimony is organized as follows:

- 10                   •       **Section II – Background:** Describes the development of the proposed updated  
11                   marginal distribution demand and marginal distribution customer costs, and the  
12                   use of these marginal distribution costs to develop the proposed electric cost-  
13                   based distribution revenue allocation.
- 14                   •       **Section III – Marginal Distribution Demand Costs:** Presents the development  
15                   of the proposed updated marginal distribution demand costs based on the National  
16                   Economic Research Associates (NERA) Regression Method.
- 17                   •       **Section IV – Marginal Distribution Customer Costs:** Presents the development  
18                   of the proposed updated marginal distribution customer costs based on the Rental  
19                   Method.
- 20                   •       **Section V – Distribution Revenue Allocation:** Presents the proposal to use the  
21                   proposed updated marginal distribution costs coupled with the Equal Percent of  
22                   Marginal Costs (EPMC) methodology to allocate the authorized distribution  
23                   revenue requirement.
- 24                   •       **Section VI – Marginal Distribution Costs of Solar Customers:** Presents the  
25                   illustrative marginal and EPMC distribution customer and demand cost rates for  
26                   Net Energy Metering (NEM) and Non-NEM customers.
- 27                   •       **Section VII – Summary and Conclusion:** Provides a summary of  
28                   recommendations.
- 29                   •       **Section VIII – Witness Qualifications:** Presents my qualifications.

30                   My testimony also contains the following attachments:

- 31                   •       **Attachment A – Proposed Marginal Distribution Costs.**

- 1 • **Attachment B** – Illustrative Cost-Based Distribution Revenue Allocation.
- 2 • **Attachment C** – Illustrative New Customer Only (NCO) Marginal Distribution  
3 Customer Costs.
- 4 • **Attachment D** – Comparison of Illustrative Marginal and EPMC Distribution  
5 Customer and Distribution Demand Cost Rates for NEM and Non-NEM  
6 Customers.

## 7 **II. BACKGROUND**

8 For more than 30 years, the California Public Utilities Commission (CPUC) has relied on  
9 marginal costs as the basis for revenue allocation and rate design development for the different  
10 customer classes. My testimony presents SDG&E’s updated studies for both marginal  
11 distribution demand and marginal distribution customer costs. The proposed updated marginal  
12 distribution demand costs are based on the NERA Regression Method while the proposed  
13 updated marginal distribution customer costs utilize the Rental Method. Recent SDG&E rate  
14 design proceedings, specifically its Test Year (TY) 2008 General Rate Case (GRC) Phase 2  
15 (Application (A.) 07-01-047), TY 2012 GRC Phase 2 (A.11-10-002), TY 2016 GRC Phase 2  
16 (A.15-04-012), and TY 2019 GRC Phase 2 (A.19-03-002), were decided by settlement on  
17 revenue allocation without formal adoption of marginal distribution costs or marginal cost  
18 methodologies.

19 Marginal cost is the change in costs caused by providing one additional unit of a good or  
20 service. In the electric utility context, marginal cost is defined as the change in cost to provide  
21 electric service to an additional customer. Marginal distribution demand costs measure the cost  
22 of serving an additional unit of customer kilowatt (kW) demand on the electric distribution  
23 system. Marginal distribution customer costs reflect the cost of serving an additional customer  
24 on the electric distribution system. These marginal distribution costs are used as a frame of

1 reference for the determination of cost-based rates when we design distribution rates to reflect  
2 the costs of providing utility electric service.

3 In addition to marginal distribution cost themselves, SDG&E is proposing that the  
4 authorized distribution revenue requirement be allocated to customer classes using the updated  
5 marginal costs proposed in my testimony and based on the System Average Percent Change  
6 (SAPC) approach, as addressed in the revised prepared direct testimony of SDG&E witness Ray  
7 Utama (Chapter 2). Allocating the authorized distribution revenue requirement based on  
8 marginal costs balances fairness and equity by providing customers clear and accurate price  
9 signals for the electric service they receive.

### 10 **III. MARGINAL DISTRIBUTION DEMAND COSTS**

#### 11 **A. Marginal Distribution Demand Cost Background**

12 Marginal distribution demand costs represent the cost of providing facilities from the  
13 substation to the customer access point in order to meet the customer's individual demand.  
14 These marginal distribution demand costs are separated into (1) marginal feeder and local  
15 distribution costs and (2) marginal substation costs

16 Consistent with its previous GRC Phase 2 proceedings, SDG&E will continue the use the  
17 NERA Regression Method to calculate marginal feeder and local distribution and substation  
18 costs for the system as a whole. By definition, the NERA Regression Method uses ten years of  
19 historical and five years of forecasted distribution investments, along with annual distribution  
20 system peak determinants in a regression methodology. The NERA Regression Method  
21 identifies the utility's cumulative incremental changes in distribution peak load data as the  
22 independent variable, the utility's cumulative incremental distribution growth-related  
23 investments as the dependent variable, and then regresses the data over a fifteen-year period of  
24 data points.

1 SDG&E’s marginal distribution demand cost component includes distribution investment  
2 costs related to load and customer growth for the period 2010-2024. These marginal distribution  
3 demand costs do not include reliability investments, replacement costs, or customer access costs,  
4 because these costs are not considered peak growth-related.

5 The distribution demand investment cost component is derived in units of dollars-per-  
6 kW. To more accurately reflect the true cost of investment, the investment costs are adjusted by  
7 various loading factors. These loading factors reflect additional costs that are related to the  
8 addition of capacity to the distribution systems. Loading factors have been derived for  
9 Operations & Maintenance (O&M), Administrative & General (A&G), General Plant (GP), and  
10 Working Capital (WC).

11 SDG&E’s cumulative change in peak load data is based on distribution planning  
12 forecasted circuit and substation loads from 2010-2024.

### 13 **B. Unit Marginal Feeder and Local Distribution Costs**

14 Marginal feeder and local distribution costs represent the cost of expanding facilities  
15 from the distribution substation to the point of customer access to serve an additional kW of  
16 demand. The cost of feeder and local distribution facilities is based on the projected investments  
17 needed to meet load growth on SDG&E’s system during a specific planning horizon. These  
18 investments include facilities such as poles, fixtures, capacitors, and overhead and underground  
19 conductors and devices.

20 The feeder and local distribution investments used in the NERA Regression Method were  
21 obtained from distribution capital budget forecasts for the period 2022 through 2024.<sup>1</sup> Only

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<sup>1</sup> 2022-2024 Distribution Capital Budget Forecasts are found in the SDG&E TY 2024 GRC Phase 1 Revised Prepared Direct Testimony of Oliva Reyes. See A.22-05-016, SDG&E Revised Prepared Direct Testimony of Oliva Reyes (Electric Distribution Capital) (August 2022), (Exhibit (Ex.) SDG&E-11-R) at Appendix B.

1 three years of forecasted data was available from the distribution capital budget data. Since only  
2 three years of forecast data was available, and 15 years of total data is required for the NERA  
3 Regression Model, twelve years of historical investment data from years 2010 through 2021 was  
4 used for the historical period. Because marginal costs reflect the cost to meet new demand on  
5 the system, only distribution investments related to capacity additions were used in the  
6 regression calculation.

7 After obtaining the feeder and local distribution investment using the NERA Regression  
8 Method, the result is then adjusted to reflect both GP and WC loaders. The resulting amount  
9 (reflected in \$/kW) is then annualized to \$/kW-year using a Real Economic Carrying Charge  
10 (RECC) factor derived for feeder and local distribution plant accounts. The annualized  
11 investment amount then receives an A&G plant loader, fixed O&M loader, and A&G fixed  
12 O&M loader. Lastly, the resulting loaded annualized investment sum is escalated to 2024 dollars  
13 to derive the marginal distribution demand costs for feeder and local distribution.<sup>2</sup>

14 SDG&E's proposed marginal distribution demand costs for feeder and local distribution  
15 are provided in Attachment A to my testimony.

### 16 **C. Unit Marginal Substation Costs**

17 Marginal substation costs represent the forecasted cost for construction of substations to  
18 serve an additional kW of demand. The marginal cost of substations is based on the projected  
19 investments needed to meet the load growth on the SDG&E system during a given period of  
20 time.

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<sup>2</sup> 2024 escalations are the cost escalation factors presented in SDG&E TY 2024 GRC Phase 1 Prepared Direct Testimony of Scott Wilder. See A.22-05-016, Workpapers to Prepared Direct Testimony of Scott Wilder - Cost Escalations, (Ex. SDG&E-41-WP).

1 The substation investments used to calculate marginal substation costs were obtained  
2 from capital budget forecasts for the period 2022 through 2024.<sup>3</sup> Only three years of forecasted  
3 substation data was available from the capital budget data. Because only three years of forecast  
4 data was available, and 15 years of total data is required for the NERA Regression Model, twelve  
5 years of historical investment data from years 2010 through 2021 was used for the historical  
6 component. Because marginal costs reflect the cost to meet new demand on the system, only  
7 distribution investments related to capacity additions were used in the regression calculation.

8 After obtaining the substation investment using the NERA Regression Method, the result  
9 is then adjusted to reflect both GP and WC loaders. The resulting amount (reflected in \$/kW) is  
10 then annualized to \$/kW-year using a RECC factor derived for substation plant accounts. The  
11 annualized investment then receives an A&G plant loader, fixed O&M loader, and A&G fixed  
12 O&M loader. Lastly, the resulting loaded annualized investment sum is escalated to 2024 dollars  
13 to derive the marginal distribution demand costs for substations.<sup>4</sup>

14 SDG&E's proposed marginal distribution demand costs for substations are provided in  
15 Attachment A to my testimony.

#### 16 **IV. MARGINAL DISTRIBUTION CUSTOMER COSTS**

##### 17 **A. Marginal Distribution Customer Cost Background**

18 Marginal distribution customer costs represent the cost of providing an individual  
19 customer access to electrical service. These marginal costs are composed of costs associated  
20 with the investment required to provide access (hook up) to a new customer and the ongoing  
21 costs related to maintaining the new customer. Customer costs related to initial access and those  
22 related to ongoing maintenance vary by customer type, size, service voltage, and type of

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<sup>3</sup> See Ex. SDG&E-11-R at Appendix B.

<sup>4</sup> Ex. SDG&E-41-WP.



1 equipment used for customer access, and include distribution-related investments for items such  
2 as final line transformers (transformers), service drops, meters, customer related O&M,  
3 Customer Service Distribution, A&G, GP, and WC.

4 Consistent with its previous GRC Phase 2 proceedings, SDG&E will continue the use of  
5 the Rental Method to calculate unit marginal customer costs for the various proposed customer  
6 classes, which for SDG&E consists of residential, small commercial, medium commercial, large  
7 commercial & industrial (large C&I), agricultural, and street lighting classes.<sup>5</sup> As explained  
8 below in Section F, SDG&E proposes the use of the Rental Method because it believes it sends a  
9 more accurate and more reasonable price signal of the cost of providing an individual customer  
10 access to the electrical system compared to other marginal distribution customer cost  
11 methodologies considered in previous GRC Phase 2 applications.

#### 12 **B. Transformer, Service Drop, and Meter (TSM) Costs**

13 The customer investment costs for each customer type, customer size, and service voltage  
14 level were calculated using the TSM method. The TSM method includes transformers, service  
15 drops, and meters as the basis of the customer hookup costs. The installed costs for the TSM  
16 component are based on a detailed analysis of each individual component. Cost estimates for the  
17 various customer sizes and service levels were developed for: (1) transformers based on  
18 transformer size and the average number of forecasted customers per transformer; (2) service  
19 drops based on wire size, number of runs, average service length, and compression lug wires;  
20 and (3) meters based on size and type (single- or three-phase). The TSM investment cost for

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<sup>5</sup> As explained in the revised prepared direct testimony of SDG&E witness Hannah Campi (Chapter 3), SDG&E is proposing to split the current medium/large commercial & industrial class into two classes: (a) medium commercial; and (b) large C&I.

1 each customer group was based on engineering estimates for a typical customer by size and  
2 class.

3 To determine the average TSM costs for each customer class, customers are grouped by  
4 maximum annual demand levels (in kW). Once grouped, the TSM costs for each customer  
5 demand level are calculated by multiplying the number of customers per demand level by the  
6 estimated demand-specific cost for each TSM component. A weighted average is then calculated  
7 for each TSM component that produces the average TSM cost per customer class. These TSM  
8 costs are then adjusted for Rule 15/Rule 16 allowances that residential and non-residential  
9 customers receive to cover TSM installation costs. For residential customers, the Rule 15/Rule  
10 16 allowance to cover TSM costs is currently \$3,981 per customer hook-up;<sup>6</sup> thus, the residential  
11 TSM costs used in the marginal distribution customer cost calculation reflects a maximum TSM  
12 cost per residential customer of \$3,981. For non-residential customers, the Rule 15/16 allowance  
13 is calculated separately for each customer;<sup>7</sup> thus, the non-residential TSM costs are adjusted for  
14 the average percentage of TSM costs paid by non-residential customers based on historical data,  
15 which is 17%.

16 Once developed, the TSM costs are multiplied by GP, WC, and A&G Plant loading  
17 factors. After receiving GP, WC, and A&G Plant loading, the TSM costs are then converted to  
18 an annualized amount (dollars-per-customer-per-year) by using a RECC that calculates an annual  
19 economic rent.

### 20 C. O&M Costs

21 In order to develop a per-customer O&M cost allocation, SDG&E analyzed the Federal  
22 Energy Regulatory Commission (FERC) Form 1 Distribution O&M account costs (580 to 598)

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<sup>6</sup> Rule 15 tariff, Sheet 5 (effective October 10, 2022) at Section C.3.

<sup>7</sup> *Id.* at Section C.4.

1 to determine which portion of each account relates to distribution demand and which relates to  
2 customer connection. The customer-connection-related account amounts are totaled for the  
3 O&M costs.

4 SDG&E then allocates the customer-related O&M costs to the various rate schedules by  
5 using a factor derived from each schedule's percentage of the grand total of the estimated TSM  
6 cost. These amounts are then adjusted by an A&G O&M loading factor before calculating the  
7 per-customer O&M cost for the marginal distribution customer costs.

#### 8 **D. Customer Service Distribution Costs**

9 Customer service distribution costs represent customer support customer costs for  
10 activities such as customer service field, smart metering, billing, credit & collections, postage,  
11 branch office, customer contact center, marketing and communication, and customer programs.  
12 The customer service distribution costs allocated for marginal distribution customer cost  
13 purposes in this proceeding are based on a study of historical 2021 SDG&E Customer Service  
14 Costs to determine the appropriate allocation of each type of Customer Service Distribution  
15 Costs identified in SDG&E's TY 2024 GRC Application.<sup>8</sup>

#### 16 **E. Shared Service Drop Costs**

17 Pursuant to the 2019 GRC Phase 2 Settlement, as adopted by D.21-07-010, SDG&E  
18 agreed to present marginal distribution customer costs for service drops shared by customers in  
19 this GRC Phase 2 application.<sup>9</sup>

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<sup>8</sup> Adjusted 2021 Customer Services Distribution Expenses presented in the SDG&E TY 2024 GRC Phase 1 Revised Prepared Direct Testimony of Ryan Hom. *See* A.22-05-016, SDG&E Revised Prepared Direct Testimony of Ryan Hom (Summary of Earnings) (August 2022), Ex. SDG&E-44-R at RH-B-39, Table RH-39.

<sup>9</sup> D.21-07-010, Appendix B, Section 2.2.16 Marginal Distribution Customer Costs – Shared Service Drops at 16.

1           Based on the 54 multi-family residential installations in 2020 and 2021, the average per  
2 residential customer service drop cost for shared service drops was \$442, in 2024 dollars. This  
3 compares to an average per residential customer non-shared service drop cost in 2024 dollars of  
4 \$331. This suggests that while customers are sharing these service drops, the cost per foot for  
5 these shared service drops is much higher, so the cost per customer for shared service drops is  
6 also higher.

7           Based on 94 multi-family non-residential installations in 2020 and 2021, the average per  
8 non-residential customer service drop cost for shared service drops was \$2,613 in 2024 dollars.  
9 The non-residential customers sharing these service drops are typically either small commercial  
10 or medium commercial customers. The average per customer non-shared service drop cost is  
11 \$644 in 2024 dollars for small commercial customers and \$1,472 in 2024 dollars for medium  
12 commercial customers. Therefore, the cost per foot for shared service drops is much higher than  
13 non-shared service drops, so the cost per customer for shared service drops is also higher.

#### 14           **F.     Support for Rental Method Adoption**

15           SDG&E has consistently proposed the use of the Rental Method to calculate unit  
16 marginal distribution customer costs in GRC Phase 2 proceedings because the Rental Method  
17 sends a more accurate and more reasonable price signal of the cost of providing an individual  
18 customer access to the electrical system compared to the NCO Method that some parties have  
19 proposed in those proceedings. In the billing of utility electricity rates, all customers pay a  
20 “rental” price for the distribution customer-related equipment or TSM costs necessary to  
21 maintain a customer account. For instance, residential customers do not pay the upfront  
22 incremental cost of the TSM assets necessary to provide them electric service but rather  
23 customers pay to recover the cost of TSM assets as part of their electric rates in their monthly

1 utility bills. Therefore, customers are essentially paying a monthly rental price for the TSM  
2 equipment installed through their monthly bills for electric service.

3         The Rental Method follows this “rental” process by annualizing the cost of the TSM  
4 investments required to maintain the accounts of all customers and then converting this annual  
5 cost into a monthly amount. Conversely, the NCO Method takes the cost per customer to hook  
6 up a new customer (not the annualized cost), multiplies that value only by the number of  
7 estimated new and replacement customers for the customer class, and then divides this amount  
8 by the total number of customers in that class to get the unit cost per customer. This method  
9 understates the marginal distribution customers costs and sends inefficient price signals to  
10 customers considering new hookups because new customers will never pay the full costs  
11 incurred to hook up to the utility’s electric system. Additionally, because the NCO Method  
12 calculation relies on the forecasted number of new and replacement customers, the resulting unit  
13 cost for TSM under the NCO Method varies considerably depending on the assumed customer  
14 class growth rates and not necessarily in response to changes in the TSM costs.

15         Attachment A to my testimony presents SDG&E’s proposed marginal distribution  
16 customer costs based on the Rental Method. In addition, for comparison purposes, Attachment C  
17 to my testimony presents illustrative SDG&E marginal distribution customer costs based on the  
18 NCO Method that has been used by other parties in SDG&E’s previous GRC Phase 2  
19 proceedings, including the NCO Method assumptions used in those proceedings.

## 20 **V. DISTRIBUTION REVENUE ALLOCATION**

21         SDG&E proposes to use the EPMC revenue allocation methodology to allocate the  
22 authorized distribution revenue requirement to customer classes. The EPMC methodology scales  
23 the customer class marginal distribution cost revenue responsibilities up or down by a single  
24 factor such that the sum equals the authorized distribution revenue requirement.

1 Under SDG&E's cost-based distribution revenue allocation proposal, the authorized  
2 distribution revenue requirement, minus any revenues that are directly assigned to a particular  
3 customer class,<sup>10</sup> is allocated among the customer classes based on the proposed marginal  
4 distribution cost revenue responsibilities by customer class. Each customer class's marginal  
5 distribution costs revenue allocation is the sum of marginal distribution customer costs, marginal  
6 feeder and local distribution costs, and marginal substation distribution costs. The unit marginal  
7 distribution costs are multiplied by the appropriate cost drivers to develop the marginal cost-  
8 based distribution revenue allocations by customer class. Marginal distribution customer cost  
9 revenues by customer class are developed by multiplying each class's unit marginal customer  
10 cost (\$/customer/year) by the forecasted number of customers in that class. Total marginal  
11 feeder and local distribution cost revenues are developed by multiplying the unit marginal feeder  
12 and local distribution costs (\$/kW/year) by the system non-coincident demand and the applicable  
13 loss factors. The customer class allocation of the marginal feeder and local distribution cost  
14 revenues is developed by multiplying the total marginal feeder and local distribution cost  
15 revenues by the product of the customer class's annual non-coincident demand and the estimated  
16 ratio of the average class contribution to the peak demand at the circuit level (Effective Demand  
17 Factor or EDF).<sup>11</sup> Total marginal substation distribution cost revenues are developed by  
18 multiplying the unit marginal substation costs (\$/kW/year) by the system non-coincident demand  
19 and the applicable loss factors. The customer class allocation of the marginal substation  
20 distribution cost revenues is developed by multiplying the total marginal substation cost revenues

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<sup>10</sup> SDG&E's directly assigned distribution revenues are labeled Non-Marginal Revenue Requirement Components and identified in Attachment B.2 to my testimony.

<sup>11</sup> EDFs reflect the ratio of the customer class's contribution to the circuit (substation) peak by dividing the class's average absolute demand (delivered and received load) at the time of the monthly circuit (substation) absolute peak demand over the class's average monthly absolute demand.

1 by the product of the customer class's annual non-coincident demand and EDF at the substation  
2 level.

3 The sum of the marginal distribution customer costs, marginal feeder and local  
4 distribution costs, and marginal substation distribution cost revenues is used to develop the  
5 distribution EPMC allocation factor. The EPMC allocation factor is then used to scale the  
6 marginal distribution class revenue allocations to equal the authorized distribution revenue  
7 requirement. The illustrative cost-based distribution revenue allocation by customer class, and  
8 the resulting EPMC distribution rates based on those revenue allocations, is provided in  
9 Attachment B.1, B.2 and B.3 to my testimony. Attachment B.1 to my testimony presents the  
10 marginal distribution cost allocation factors by customer class. Attachment B.2 to my testimony  
11 presents the allocation of distribution revenues to each customer class based on the marginal  
12 distribution cost allocations factors. Attachment B.3 to my testimony presents the resulting  
13 EPMC distribution rates and revenues by customer class.

#### 14 **VI. MARGINAL DISTRIBUTION COSTS OF SOLAR CUSTOMERS**

15 Pursuant to the 2019 GRC Phase 2 Settlement Agreement, adopted by D.21-07-010,  
16 SDG&E agreed to perform an analysis on the marginal costs of solar customers in this GRC  
17 Phase 2 proceeding.<sup>12</sup> SDG&E performed an analysis examining the resulting marginal cost rate  
18 differences between solar customers on NEM and non-NEM customers. Attachment D to my  
19 testimony presents the comparison of the illustrative marginal and EPMC distribution customer  
20 costs and distribution demand cost rates for NEM and non-NEM customers.

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<sup>12</sup> D.21-07-010, Appendix B, Section 2.2.6 Marginal Cost of Solar Customers at 13.

1 **VII. SUMMARY AND CONCLUSION**

2           SDG&E recommends that the CPUC adopt SDG&E’s updated proposed marginal  
3 distribution demand and marginal distribution customer costs, presented in Attachment A, and  
4 SDG&E’s proposal to use these marginal distribution costs coupled with the EPMC  
5 methodology to allocate authorized distribution revenue requirements, as presented in  
6 Attachment B to my testimony.

7           This concludes my revised prepared direct testimony.



1 **VIII. WITNESS QUALIFICATIONS**

2 My name is William G. Saxe. My business address is 8330 Century Park Court, San  
3 Diego, California 92123. I am employed at SDG&E as the Rates & Cost Studies Project  
4 Manager in the Customer Pricing Department. I have worked for SDG&E since February 2001.  
5 Prior to joining SDG&E, I was employed by Sempra Energy, the parent company of SDG&E,  
6 from April 1999 through January 2001. In addition, I was employed by the Illinois Commerce  
7 Commission (ICC) from September 1990 through April 1999.

8 I received a Bachelor of Science degree in Economics from the University of Wisconsin-  
9 Madison in 1985. I received a Master of Business Administration degree, with a concentration in  
10 Finance, from the University of Wisconsin-Madison in 1990.

11 I have previously testified before the CPUC on rate design, marginal cost and other  
12 issues. In addition, I have previously submitted testimony before the FERC and the ICC.

**ATTACHMENT A**

**PROPOSED MARGINAL DISTRIBUTION COSTS**

ATTACHMENT A

SAN DIEGO GAS & ELECTRIC COMPANY (SDG&E)  
 TEST YEAR (TY) 2024 GENERAL RATE CASE (GRC) PHASE 2, APPLICATION (A.) 23-01-008  
 MARGINAL DISTRIBUTION COSTS

Proposed Distribution Marginal Unit Costs

Line No.	Description (A)	Secondary (B)	Primary (C)	Transmission (D)	Line No.
1	<b>Customer Marginal Cost Based on Rental Method:</b>				1
2	Residential (\$/Customer/Year)	\$180.61			2
3					3
4	Small Commercial (\$/Customer/Year)				4
5	0 - 5 kW	\$273.93	\$546.93		5
6	>5 - 20 kW	\$549.43	\$546.93		6
7	>20 - 50 kW	\$841.75	\$546.93		7
8	>50 kW	\$1,392.74	\$604.91		8
9					9
10	Medium Commercial (\$/Customer/Year)				10
11	≤100 kW	\$1,309.73	\$749.33		11
12	> 100 - 200 kW	\$1,940.58	\$749.33		12
13					13
14	Large Commercial & Industrial (\$/Customer/Year)				14
15	≤500 kW	\$2,487.60	\$752.02	\$7,133.94	15
16	500 - 12 MW	\$4,679.01	\$851.37	\$9,645.74	16
17	> 12 MW		\$1,159.13	\$13,047.80	17
18					18
19	Agricultural (\$/Customer/Year)				19
20	≤20 kW	\$515.26	\$709.00		20
21	>20 kW	\$957.48	\$709.00		21
22					22
23	Lighting (\$/Lamp/Year)	\$8.04			23
24					24
25	<b>Demand-Related Marginal Cost:</b>				25
26	Feeders & Local Distribution Demand (\$/kW/Year)	\$61.48	\$61.48		26
27					27
28	Substation Demand (\$/kW/Year)	\$30.76	\$30.76		28
29					29
30	<b>Total Demand-Related Marginal Cost (\$/kW/Year)</b>	<b>\$92.24</b>	<b>\$92.24</b>		30

Note: Customer, Feeder & Local Distribution Demand and Substation Demand Unit Marginal Costs: Customer, Feeder & Local Distribution Demand and Substation Demand Unit Marginal Costs are from the revised direct testimony workpapers of SDG&E witness William G. Saxe (Chapter 4).

**ATTACHMENT B**

**ILLUSTRATIVE COST-BASED DISTRIBUTION REVENUE ALLOCATION**

ATTACHMENT B.1

SAN DIEGO GAS & ELECTRIC COMPANY (SDG&E)  
 TEST YEAR (TY) 2024 GENERAL RATE CASE (GRC) PHASE 2, APPLICATION (A.) 23-01-008  
 DISTRIBUTION REVENUE ALLOCATION

Distribution Marginal Cost Allocation Factor by Customer Class

Line No.	Customer Class (A)	Customer Marginal Revenue (\$000) (B)	Percentage Allocation (%) (C)	Demand-Related Marginal Revenue (\$000) (D)	Percentage Allocation (%) (E)	Total Distribution Marginal Revenue (\$000) (F)	Distribution Marginal Cost Allocation Factor (%) (G)	Line No.
1	Residential	\$247,348	72.0%	\$284,891	43.3%	\$532,239	53.1%	1
2								2
3	Small Commercial	\$57,345	16.7%	\$66,315	10.1%	\$123,660	12.3%	3
4								4
5	Medium Commercial	\$23,415	6.8%	\$107,135	16.3%	\$130,550	13.0%	5
6								6
7	Large Commercial & Industrial	\$12,032	3.5%	\$186,355	28.3%	\$198,388	19.8%	7
8								8
9	Agricultural	\$3,385	1.0%	\$12,205	1.9%	\$15,589	1.6%	9
10								10
11	Lighting	\$42	0.01%	\$1,068	0.2%	\$1,110	0.1%	11
12								12
13	System	\$343,568	100.0%	\$657,968	100.0%	\$1,001,536	100.0%	13

Note:

- (1) Customer Marginal Cost Revenue: reflects customer-related distribution marginal costs.
- (2) Demand-Related Marginal Cost Revenue: reflects feeder & local distribution and substation demand-related distribution marginal costs.

ATTACHMENT B.2

SAN DIEGO GAS & ELECTRIC COMPANY (SDG&E)  
 TEST YEAR (TY) 2024 GENERAL RATE CASE (GRC) PHASE 2, APPLICATION (A.) 23-01-008  
 DISTRIBUTION REVENUE ALLOCATION

Illustrative Distribution Revenue Allocation by Customer Class

Line No.	Customer Class (A)	Updated Distribution Revenue Allocation <sup>1</sup>				Comparison to Current Allocation <sup>2</sup>		Line No.
		Distribution Allocation Factors (%) (B)	Non Marginal Distribution Revenue (\$000) (C)	Marginal Distribution Revenue (\$000) (D)	Proposed Cost-Based Total Distribution Revenue Allocation (\$000) (E)	Proposed Cost-Based Total Distribution Revenue Allocation (%) (F)	Current Total Distribution Revenue Allocation (\$000) (G)	
1	Residential	53.1%		\$1,022,920	\$1,022,920	52.7%	\$885,896	15.5%
2								
3	Small Commercial	12.3%		\$237,665	\$237,665	12.3%	\$283,912	-16.3%
4								
5	Medium Commercial	13.0%	\$138	\$250,907	\$251,045	12.9%	\$730,150	-11.9%
6								
7	Large Commercial & Industrial	19.8%	\$11,199	\$381,285	\$392,484	20.2%		
8								
9	Agricultural	1.6%		\$29,962	\$29,962	1.5%	\$26,986	11.0%
10								
11	Lighting	0.1%	\$3,895	\$2,133	\$6,029	0.3%	\$13,160	-54.2%
12								
13	System	100.00%	\$15,232	\$1,924,872	\$1,940,104	100.00%	\$1,940,104	0.0%
14								
15	Distribution Revenue Requirement (\$000): <sup>3</sup>				\$1,940,104			
16								
17	Non-Marginal Revenue Requirement Components (\$000):				\$3,895			
18	Lighting Facilities & Maintenance Charge Revenues: <sup>4</sup>							
19								
20	Standby Revenues: <sup>5</sup>							
21	Medium Commercial				\$113			
22	Large Commercial & Industrial				\$8,041			
23	Total				\$8,154			
24								
25	Distance Adjustment Fee Revenues: <sup>6</sup>							
26	Medium Commercial				\$25			
27	Large Commercial & Industrial				\$3,157			
28	Total				\$3,182			

Note:

- (1) Updated Distribution Revenue Allocation: allocation of the current distribution revenue requirement based on the marginal Distribution Allocation Factors presented in this Application.
- (2) Current Total Distribution Revenue Allocation: allocation of current distribution revenue requirement based on the current class distribution allocation percentages reflected in current rates; rates effective January 1, 2023, pursuant to SDG&E Advice Letter 4129-E.
- (3) Distribution Revenue Requirement: the \$1,940,104,131 Distribution Revenue Requirement reflects the current distribution revenues being collected in rates effective January 1, 2023, pursuant to SDG&E Advice Letter 4129-E, excluding revenues that have separate allocation treatment such as Demand Response (DR), Vehicle-Grid Integration (VG), Medium Duty Electric Vehicle (MD/ED), and DG-R Under-Over-Collectors.
- (4) Non-Marginal Lighting Facilities & Maintenance Charge Revenues: Lighting Facilities Charges of \$3,895,000 is the annual lighting facilities and maintenance revenues identified in the Lighting Model from SDG&E witness William Saxe (Chapter 6) revised direct testimony workpapers.
- (5) Non-Marginal Standby Revenues: Standby Revenues of \$8,154,000 is the standby revenues based on the forecasted 2024 standby determinants multiplied by the applicable current standby rates effective January 1, 2023, pursuant to SDG&E Advice Letter 4129-E.
- (6) Non-Marginal Distance Adjustment Fee Revenues: Distance Adjustment Fees of \$3,182,000 is the annual distance adjustment fees revenues based on the forecasted overhead and underground distance adjustment fee 2024 determinants in feet multiplied by the applicable current distance adjustment fees effective January 1, 2023, pursuant to SDG&E Advice Letter 4129-E.

ATTACHMENT B.3

SAN DIEGO GAS & ELECTRIC COMPANY (SDG&E)  
 TEST YEAR (TY) 2024 GENERAL RATE CASE (GRC) PHASE 2, APPLICATION (A) 23-01-008  
 DISTRIBUTION REVENUE ALLOCATION

Distribution Equal Percentage of Marginal Cost (EPMC) Rates and Revenue by Customer Class

Line No.	Customer Class (A)	Determinants (B)	Marginal Distribution Rate (C)	EPMC Distribution Rate (D)	EPMC Distribution Revenue Allocation (\$000) (E)	Line No.
1	Residential					1
2		Customer Marginal Cost (\$/Customer-Month)	\$15.05	\$28.93	\$475,383	2
3		Summer On-Peak Demand-Related Marginal Cost (\$/On-Peak kW)	\$0.84	\$1.61	\$32,836	3
4		Non-Coincident Demand-Related Marginal Cost (\$/Non-Coincident kW)	\$4.98	\$9.57	\$514,701	4
5		Total - Residential			\$1,022,920	5
6						6
7	Small Commercial					7
8		Customer Marginal Cost (\$/Customer-Month)				8
9		Secondary				9
10		0 - 5 kW	\$22.83	\$43.87	\$32,652	10
11		>5 - 20 kW	\$45.79	\$88.00	\$64,951	11
12		>20 - 50 kW	\$70.15	\$134.81	\$11,159	12
13		>50 kW	\$116.06	\$223.06	\$1,346	13
14		Secondary Total	\$36.46	\$70.08	\$110,109	14
15						15
16		Primary				16
17		0 - 5 kW	\$45.58	\$87.60	\$83	17
18		>5 - 20 kW	\$45.58	\$87.60	\$15	18
19		>20 - 50 kW	\$45.58	\$87.60	\$2	19
20		>50 kW	\$50.41	\$96.88	\$5	20
21		Primary Total	\$45.78	\$87.99	\$104	21
22						22
23		Summer On-Peak Demand-Related Marginal Cost (\$/On-Peak kW)				23
24		Secondary	\$1.29	\$2.49	\$7,654	24
25		Primary	\$1.29	\$2.48	\$10	25
26		Total	\$1.29	\$2.49	\$7,664	26
27					\$0	27
28		Non-Coincident Demand-Related Marginal Cost (\$/Non-Coincident kW)			\$0	28
29		Secondary	\$7.57	\$14.55	\$119,573	29
30		Primary	\$7.53	\$14.47	\$214	30
31		Total	\$7.57	\$14.55	\$119,787	31
32						32
33		Total - Small Commercial			\$237,665	33







93 Agricultural

94	Customer Marginal Cost (\$/Customer-Month)	93	
95	Secondary	94	
96	≤20 kW	16,336	95
97	>20 kW	33,506	96
98	Secondary Total	\$42,94	97
99		\$79,79	98
100	Primary	\$67,71	99
101	≤20 kW	\$59,08	100
102	>20 kW	\$59,08	101
103	Primary Total	\$113,55	102
104		\$113,55	103
105	Summer On-Peak Demand-Related Marginal Cost (\$/On-Peak kW)		104
106	Secondary	411,428	105
107	Primary	\$2,87	106
108	Total	\$2,85	107
109		\$2,86	108
110	Non-Coincident Demand-Related Marginal Cost (\$/Non-Coincident kW)		109
111	Secondary	1,389,540	110
112	Primary	\$7,32	111
113	Total	\$7,28	112
114		\$7,31	113
115	Total - Agricultural		114
		\$22,099	115
		\$29,962	

116	Lighting								
117									
118		Customer Marginal Cost (\$/Lamp-Month)						\$0.26	\$0.49
119		Summer On-Peak Demand-Related Marginal Cost (\$/On-Peak kW)	162,621					\$0.63	\$1.21
120		Non-Coincident Demand-Related Marginal Cost (\$/Non-Coincident kW)	99,089					\$4.23	\$8.13
121		Total - Lighting	237,814						\$2,133
122									
123	Total-System								
124		Customer Marginal Cost (\$/Customer-Month)							\$660,310
125		Summer On-Peak Demand-Related Marginal Cost (\$/On-Peak kW)							\$75,683
126		Non-Coincident Demand-Related Marginal Cost (\$/Non-Coincident kW)							\$1,188,879
127		Total - System							\$1,924,872
128									
129		GRC Phase 1 Distribution Revenue Requirement:						1,940,104	
130		Non-Marginal Revenue Requirement						15,232	
131		Marginal Distribution Revenue Requirement Allocation						1,924,872	
132									
133		Marginal Customer Distribution Revenue Requirement						343,568	
134		Marginal Demand-Related Distribution Revenue Requirement						657,968	
135		Total Marginal Distribution Revenue Requirement						1,001,536	
136		EPMC Allocation Factor							192.19%
137									

Notes: (1) Distribution EPMC Rates and Revenues by Customer Class: the distribution EPMC rates and revenues by customer class presented are from the revised direct testimony workpapers of SD&E witness William G. Saxe (Chapter 4).

(2) Marginal Distribution Rate: equals the marginal cost by class and by voltage level for demand-related margin cost divided by the class determinants.

(3) EPMC Distribution Rate: equals the Marginal Distribution Rate multiplied by the EPMC Distribution Allocation Factor.

(4) EPMC Distribution Revenue Allocation: equals the EPMC Distribution Rate multiplying by the applicable determinants.

**ATTACHMENT C**

ILLUSTRATIVE NEW CUSTOMER ONLY (NCO) MARGINAL DISTRIBUTION  
CUSTOMER COSTS

ATTACHMENT C

SAN DIEGO GAS & ELECTRIC COMPANY (SDG&E)  
 TEST YEAR (TY) 2024 GENERAL RATE CASE (GRC) PHASE 2, APPLICATION (A.) 23-01-008  
 MARGINAL DISTRIBUTION CUSTOMER COSTS

Distribution Customer Marginal Unit Cost by Customer Class Based on New Customer Only (NCO) Method  
 Illustrative Marginal Customer Costs --- Not Proposed by SDG&E

Line No.	Description (A)	Secondary (B)	Primary (C)	Transmission (D)	Line No.
1	Customer Marginal Cost Based on NCO Method:				1
2	Residential (\$/Customer/Year)	\$98.56			2
3					3
4	Small Commercial (\$/Customer/Year)				4
5	0 - 5 kW	\$198.04	\$280.58		5
6	>5 - 20 kW	\$280.41	\$280.58		6
7	>20 - 50 kW	\$360.34	\$280.58		7
8	>50 kW	\$516.64	\$294.79		8
9					9
10	Medium Commercial (\$/Customer/Year)				10
11	≤100 kW	\$656.78	\$435.45		11
12	> 100 - 200 kW	\$806.31	\$431.54		12
13					13
14	Large Commercial & Industrial (\$/Customer/Year)				14
15	> 200 - 500 kW	\$1,114.54	\$438.14	\$2,871.77	15
16	> 500 - 12 MW	\$1,684.69	\$464.29	\$3,569.61	16
17	> 12 MW		\$520.80	\$4,639.43	17
18					18
19	Agricultural (\$/Customer/Year)				19
20	≤20 kW	\$330.24	\$318.26		20
21	>20 kW	\$665.10	\$318.26		21
22					22
23	Lighting (\$/Lamp/Year)	\$3.39			23

Note: Distribution Customer Marginal Unit Cost by Customer Class Based on NCO Method: the distribution customer marginal unit costs by customer class based on the NCO Method are being provided for comparison purposes only.

## **ATTACHMENT D**

**ILLUSTRATIVE MARGINAL AND EPMC DISTRIBUTION CUSTOMER AND  
MARGINAL DISTRIBUTION DEMAND COST RATES FOR NEM AND NON-NEM  
CUSTOMERS**

ATTACHMENT D

SAN DIEGO GAS & ELECTRIC COMPANY (SDG&E)  
 TEST YEAR (TY) 2024 GENERAL RATE CASE (GRC) PHASE 2, APPLICATION (A.) 23-01-008  
 DISTRIBUTION REVENUE ALLOCATION

Comparison of Illustrative Net Energy Metering (NEM) and Non-NEM Distribution Equal Percentage of Marginal Cost (EPMC) Rates and Revenue by Customer Class

Line No.	Customer Class (A)	Non-NEM Rates			NEM Rates			Line No.
		Marginal Distribution Rate <sup>1</sup> (B)	EPMC Distribution Rate <sup>2</sup> (C)	Marginal Distribution Rate <sup>1</sup> (D)	EPMC Distribution Rate <sup>2</sup> (E)			
1	Residential						1	
2	Customer Marginal Cost (\$/Customer-Month)	\$14.59	\$28.04	\$17.98	\$34.56		2	
3	Summer On-Peak Demand-Related Marginal Cost (\$/On-Peak kW)	\$0.75	\$1.44	\$1.15	\$2.21		3	
4	Non-Coincident Demand-Related Marginal Cost (\$/Non-Coincident kW)	\$4.48	\$8.61	\$6.80	\$13.07		4	
5							5	
6	Small Commercial						6	
7							7	
8	Customer Marginal Cost (\$/Customer-Month)						8	
9	Secondary	\$22.80	\$43.82	\$25.47	\$48.94		9	
10	0 - 5 kW	\$45.80	\$88.03	\$45.37	\$87.20		10	
11	>5 - 20 kW	\$70.08	\$134.68	\$72.29	\$138.93		11	
12	>20 - 50 kW	\$116.05	\$223.05	\$117.05	\$224.95		12	
13	>50 kW	\$36.30	\$69.76	\$46.38	\$89.15		13	
14	Secondary Total						14	
15	Primary	\$45.58	\$87.60	\$45.53	\$87.50		15	
16	0 - 5 kW	\$45.58	\$87.60	\$0.00	\$0.00		16	
17	>5 - 20 kW	\$45.58	\$87.60	\$0.00	\$0.00		17	
18	>20 - 50 kW	\$50.41	\$96.88	\$0.00	\$0.00		18	
19	>50 kW	\$45.79	\$88.00	\$45.53	\$87.50		19	
20	Primary Total						20	
21	Summer On-Peak Demand-Related Marginal Cost (\$/On-Peak kW)	\$1.29	\$2.48	\$1.29	\$2.49		21	
22	Secondary	\$1.29	\$2.48	\$1.29	\$2.49		22	
23	Primary	\$1.29	\$2.48	\$1.29	\$2.49		23	
24	Total						24	
25							25	
26							26	
27	Non-Coincident Demand-Related Marginal Cost (\$/Non-Coincident kW)	\$7.53	\$14.48	\$7.56	\$14.52		27	
28	Secondary	\$7.53	\$14.48	\$7.56	\$14.52		28	
29	Primary	\$7.49	\$14.40	\$7.52	\$14.45		29	
30	Total	\$7.55	\$14.48	\$7.56	\$14.52		30	





86	Agricultural												
87		Customer Marginal Cost (\$/Customer-Month)											
88		Secondary											
89		<20 kW	\$42.05	\$60.83	\$57.03	\$109.61							
90		>20 kW	\$78.37	\$150.63	\$94.53	\$181.68							
91		Secondary Total	\$66.05	\$126.95	\$87.09	\$167.39							
92													
93		Primary											
94		<20 kW	\$55.49	\$106.64	\$0.00	\$0.00							
95		>20 kW	\$55.49	\$106.64	\$62.35	\$119.84							
96		Primary Total	\$55.49	\$106.64	\$62.35	\$119.84							
97													
98		Summer On-Peak Demand-Related Marginal Cost (\$/On-Peak kW)											
99		Secondary	\$1.34	\$2.57	\$1.97	\$3.78							
100		Primary	\$1.33	\$2.55	\$1.96	\$3.76							
101		Total	\$1.34	\$2.57	\$1.97	\$3.78							
102													
103		Non-Coincident Demand-Related Marginal Cost (\$/Non-Coincident kW)											
104		Secondary	\$6.54	\$12.58	\$9.69	\$18.62							
105		Primary	\$6.51	\$12.51	\$9.64	\$18.52							
106		Total	\$6.54	\$12.57	\$9.68	\$18.61							
107													
108	Lighting												
109		Customer Marginal Cost (\$/Lamp-Month)	\$0.26	\$0.49	NA	NA							
110		Summer On-Peak Demand-Related Marginal Cost (\$/On-Peak kW)	\$0.55	\$1.06	NA	NA							
111		Non-Coincident Demand-Related Marginal Cost (\$/Non-Coincident kW)	\$3.77	\$7.25	NA	NA							

Notes:

(1) Marginal Distribution Rate. equals the marginal cost by class and by voltage level for demand-related margin cost divided by the class determinants.

(2) EPMC Distribution Rate. equals the Marginal Distribution Rate multiplied by the EPMC Distribution Allocation Factor.