

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

Application of San Diego Gas & Electric
Company (U 902 E) for Authority to Update Electric
Rate Design Regarding Residential Default Time-
Of-Use Rates and Fixed Charges

Application 17-12-_____

**PREPARED DIRECT TESTIMONY OF
WILLIAM G. SAXE
ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY**

CHAPTER 5

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

DECEMBER 20, 2017



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1 on the following four marginal distribution customer cost methodologies: (1) Rental Method; (2)
2 New Customer Only (“NCO”) Method; (3) Adjusted Rental Method #1 (“ARM1”); and (4)
3 Adjusted Rental Method #2 (“ARM2”).³

4 Section II of my testimony describes the marginal distribution customer cost
5 methodologies used to calculate SDG&E’s Eligible Fixed Costs, namely SDG&E’s proposed
6 Rental Method and the additional NCO, ARM1, and ARM2 methodologies. It also explains that
7 SDG&E has continuously used the Rental Method to develop marginal distribution costs in its
8 proceedings because the Rental Method sends a more accurate and more reasonable price signal
9 on the cost of providing an individual customer access to the electrical system.

10 Section III of my testimony presents the development of marginal distribution customer
11 costs consistent with the marginal distribution customer costs proposed in SDG&E’s 2016 GRC
12 Phase 2, A.15-04-012. Marginal distribution customer costs reflect the cost of adding an
13 additional customer to the electric distribution grid. These marginal costs are composed of
14 distribution costs associated with final-line transformers, service drops, and meters (“TSM”), and
15 customer service costs, also referred to as revenue cycle services (“RCS”) costs. As noted in the
16 Direct Testimony of SDG&E witness Cynthia Fang, SDG&E proposes implementation of the
17 residential fixed charges in 2020. Given that SDG&E’s most recent marginal distribution cost
18 studies submitted in its 2016 GRC Phase 2 proceeding reflect 2016 costs (and updated marginal
19 cost studies will not be filed until December 2018 as part of its 2019 GRC Phase 2), SDG&E
20 applied escalation factors to its 2016 GRC Phase 2 marginal distribution customer cost values to
21 better reflect costs to be implemented in 2020. These values provide the distribution cost-basis
22 for SDG&E’s higher fixed charge rate option proposal, as described in the Direct Testimonies of

³ Id. at 60, Ordering Paragraph (“OP”) 1.

1 SDG&E witnesses Cynthia Fang and Jeffrey Shaughnessy. Attachment A to my Direct
2 Testimony presents SDG&E’s marginal distribution customer costs based on the Rental, NCO,
3 ARM1, and ARM2 methodologies.

4 Section IV of my Direct Testimony presents the development of the Eligible Fixed Costs
5 proposed for recovery in a residential fixed charge pursuant to D.17-09-035. In D.17-09-035, the
6 CPUC adopted the categories of costs that could be included in Eligible Fixed Costs.

7 Specifically, the CPUC determined that a residential fixed charge could include average meter
8 and customer service costs, along with the minimum cost for service drops and final-line
9 transformers, the cost of which are based on the “minimum observed costs” for the residential
10 class.⁴ These values provide the distribution cost basis for SDG&E’s default residential fixed
11 charge and minimum bill proposals, as described in the Direct Testimonies of SDG&E witnesses
12 Cynthia Fang and Jeffrey Shaughnessy. Attachment B to my Direct Testimony presents
13 SDG&E’s Eligible Fixed Costs based on the Rental, NCO, ARM1, and ARM2 methodologies.

14 **II. MARGINAL DISTRIBUTION CUSTOMER COST METHODOLOGIES**

15 **A. Methodologies**

16 As noted above, pursuant to D.17-09-035, the SDG&E TSM marginal costs presented in
17 this proceeding are calculated based on four different marginal distribution customer cost
18 methodologies:⁵

19 1) Rental Method

20 The Rental Method calculates the unit TSM marginal customer access cost (\$/customer)
21 based on the capital-related TSM costs of connecting all customers to the grid multiplied by an

⁴ Id.

⁵ Id.

1 annuitized value of such long-run costs by applying a Real Economic Carrying Charge
2 (“RECC”) factor over the life of the TSM investment.

3 2) NCO Method

4 The NCO Method uses the same capital-related TSM costs per customer as the Rental
5 Method, but these costs are multiplied by a present worth factor (for the present value of revenue
6 requirements for the lives of the TSM equipment) and by the number of forecasted new and
7 replacement customer connections by customer class divided by total customers in that customer
8 class.

9 3) ARM1 Method

10 The ARM1 Method takes the TSM marginal customer access cost (\$/customer)
11 developed in the Rental Method and adjusts the results by a factor equal to TSM rate base
12 divided by TSM incremental costs.

13 4) ARM2 Method

14 The ARM2 Method takes the TSM marginal customer access cost (\$/customer)
15 developed in the Rental Method and adjusts the results by a factor equal to the sum of TSM
16 incremental costs minus TSM accumulated depreciation divided by TSM incremental costs.

17 **B. Support for Rental Method Adoption**

18 As stated in the Opening Comments and Joint Reply Comments provided in the
19 proceeding addressing Eligible Fixed Cost categories, the IOUs (“Joint Utilities”) support the
20 Rental Method as the most appropriate methodology for calculating marginal distribution

1 customer costs.⁶ SDG&E has consistently proposed to use the Rental Method to calculate unit
2 marginal distribution customer costs in GRC Phase 2 proceedings because the Rental Method
3 sends a more accurate and more reasonable price signal on the cost of providing an individual
4 customer access to the electrical system. In the billing of utility electricity rates, all customers
5 pay a “rental” price for the distribution customer-related equipment or TSM costs necessary to
6 maintain a customer account. For instance, residential customers do not pay the upfront
7 incremental cost of the TSM assets necessary to provide them electric service but rather
8 customers pay electric rates in their monthly utility bills to recover the cost of TSM assets.
9 Therefore, by paying electric utility rates through monthly bills customers are essentially paying
10 a monthly rental price for the TSM equipment installed to allow them to receive electric service.

11 The Rental Method follows this “rental” process by annualizing the cost of the TSM
12 investments required to maintain the accounts of all customers and then converting this annual
13 cost into a monthly amount. Conversely, the NCO Method understates the marginal distribution
14 customer costs because this method takes the full cost per customer to hook up a new customer
15 (not the annualized cost), multiplies that value only by the number of estimated new and
16 replacement customers for the customer class, and then divides this amount by the total number
17 of customers in that class to get the unit cost per customer. This results in inefficient price
18 signals to customers considering new hookups because this approach assures that new customers
19 will never pay the full costs incurred to hook up to the utility’s electric system. Also, because
20 the NCO Method calculation relies on the forecasted number of new and replacement customers,

⁶ Opening Comments and Response to Appendix A Questions of Southern California Edison Company (U 338-E), Pacific Gas and Electric Company (U 39E), and San Diego Gas & Electric Company (U 902E) in A.16-06-013, January 20, 2017, at 19-22; and Joint Reply Comments of Southern California Edison Company (U 338-E), Pacific Gas and Electric Company (U 39E), and San Diego Gas & Electric Company (U 902E) in A.16-06-013, February 24, 2017, at 12-14.

1 the resulting unit cost for TSM under the NCO Method varies considerably depending on the
2 assumed customer class growth rates and not necessarily in response to changes in the TSM
3 costs.

4 Regarding ARM1 and ARM2, these methods start with Rental Method results and thus,
5 these methods correctly annualize the TSM costs to develop the TSM marginal costs. The
6 CPUC Energy Division introduced ARM1 and ARM2 in the proceeding addressing Eligible
7 Fixed Cost categories⁷ in an attempt to reach a middle ground between the Rental and NCO
8 methodologies by adjusting the Rental Method results by historical rate base or accumulated
9 depreciation of TSM costs, respectively. However, applying these accounting adjustments to the
10 Rental Method results in ARM1 and ARM2 diminishing the efficiency of the marginal price
11 signal because these methodologies adjust the incremental TSM costs by historical cost
12 information.

13 For the reasons stated above, SDG&E proposes the use of the Rental Method to calculate
14 TSM marginal costs in this proceeding.

15 **III. SDG&E MARGINAL DISTRIBUTION CUSTOMER COSTS**

16 In its 2016 GRC Phase 2 (A.15-04-012), SDG&E proposed marginal distribution
17 customer costs for the purpose of distribution revenue allocation and rate design. As noted
18 above, marginal distribution customer costs represent the cost of providing an individual
19 customer access to electrical service. The marginal distribution customer costs proposed were
20 composed of costs associated with capital investments in TSM, including various loaders applied
21 to these investments, along with customer service costs.

⁷ A.16-06-013.

1 The customer TSM investment costs for each customer type, customer size, and service
2 voltage level were calculated using a detailed analysis of each individual TSM component. Cost
3 estimates for the various customer demand and service levels were developed for: (a) final-line
4 transformers based on transformer size and the average number of customers per transformer; (b)
5 service drops based on wire size, number of runs, average service length, and compression lug
6 wires; and (c) meters based on size and type (single- or three-phase). The TSM investment cost
7 for each customer group was based on actual 2013 TSM material, labor, and overhead costs
8 escalated into 2016 dollars, and applied to engineering estimates for the TSM equipment needs
9 by customer size and class.

10 To determine the average TSM costs for each customer class, customers are grouped by
11 maximum annual demand levels (in kilowatts [“kW”]). Once grouped, the TSM costs for each
12 customer’s demand level are calculated by multiplying the number of customers per demand
13 level by the estimated demand-specific cost for each TSM component. A weighted average is
14 then calculated for each TSM component, which produces the average TSM cost per customer
15 class. Once developed, the TSM costs are multiplied by the general plant (“GP”), working
16 capital (“WC”), and operations & maintenance (“O&M”) loading factors.

17 Attachment A presents the marginal distribution customer costs based on the Rental
18 Method that SDG&E proposed in its 2016 GRC Phase 2 proceeding, A.15-04-012, escalated into
19 2020 dollars.⁸ In addition, for comparison purposes, Attachment A presents the illustrative
20 marginal distribution customer cost results based on the NCO, ARM1, and ARM2
21 methodologies. These marginal distribution customer cost calculations are based on the costs

⁸ D.17-08-030 adopted the settlement agreement on revenue allocation in A.15-04-012 and thus, there was no formal adoption of the marginal distribution customer costs proposed by parties in this proceeding.

1 associated with TSM and customer service costs scaled by the applicable equal percent of
2 marginal cost (“EPMC”) distribution allocation factor to ensure recovery of the SDG&E
3 authorized distribution revenue requirement.⁹ My workpapers for this Direct Testimony provide
4 the calculation of the GRC Phase 2 marginal distribution customer costs by methodology, as
5 presented in Attachment A. As discussed above, the Rental Method is the most appropriate
6 methodology for calculating marginal TSM costs. Accordingly, SDG&E proposes that the
7 Rental Method be used to develop the marginal distribution customer costs adopted in this
8 proceeding.

9 **IV. SDG&E ELIGIBLE FIXED COSTS**

10 As noted above, D.17-09-035 adopted the Eligible Fixed Costs categories that could be
11 proposed for recovery in a residential fixed charge in this RDW proceeding. Specifically, the
12 CPUC determined that Eligible Fixed Costs could include average meter and customer service
13 costs, along with the minimum cost for service drops and final-line transformers, based on the
14 “minimum observed costs” for the residential class.¹⁰

15 Pursuant to D.17-09-035, the Eligible Fixed Costs calculated by SDG&E are based on the
16 costs and methodologies presented in SDG&E’s most recent GRC Phase 2 proceeding (SDG&E
17 2016 GRC Phase 2, A.15-04-012, adopted in D.17-08-030).¹¹ The Chapter 5 Rebuttal Testimony
18 of SDG&E witness William Saxe in that proceeding presented the forecasted average marginal
19 distribution customer costs for the residential customer class that includes TSM costs that vary

⁹ The marginal distribution customer costs based on the Rental and NCO methodologies differ from the costs presented in A.15-04-012 because the costs have been escalated into 2020 dollars and the authorized distribution revenue requirement used to calculate the EPMC adjustment factor is based on current distribution revenues recovered in rates effective December 1, 2017, pursuant to Advice Letter 3130-E-B.

¹⁰ D.17-09-035 at 60, OP 1.

¹¹ The marginal distribution customer costs presented in SDG&E’s 2016 GRC Phase 2 proceeding reflect 2013 costs escalated into 2016 dollars. The costs in this proceeding have been escalated into 2020 dollars.

1 by customer size, voltage level, and equipment type. Consistent with D.17-09-035, the meter
2 and customer service costs included in the Eligible Fixed Costs are based on the average costs
3 presented in SDG&E's 2016 GRC Phase 2. Also, consistent with D.17-09-035, SDG&E
4 included the "minimum observed costs" for service drops and final-line transformers based on
5 the cost data provided in SDG&E's 2016 GRC Phase 2 Chapter 5 Rebuttal Testimony
6 Workpapers.¹² As directed in D.17-09-035, the three California IOUs are jointly proposing that
7 the "minimum observed costs" for service drops and final-line transformers be based on the 20th
8 percentile of each IOU's service drops and final-line transformers cost distribution.¹³ For
9 SDG&E, the 20th percentile of service drops and final-line transformers costs reflect the costs for
10 the smallest service drops and final-line transformers equipment needed to serve SDG&E's
11 smallest residential customers that have demand between 0-2 kW, which represent
12 approximately 37% of SDG&E's residential customers.

13 Attachment B presents SDG&E's proposed Eligible Fixed Costs based on the Rental
14 Method, which consist of the average meter and customer service costs, and minimum observed
15 service drops and final-line transformers costs from SDG&E's 2016 GRC Phase 2 escalated into
16 2020 dollars. In addition, for comparison purposes, Attachment B presents illustrative Eligible
17 Fixed Costs based on the NCO, ARM1, and ARM2 methodologies. My workpapers for this
18 Direct Testimony provide the calculation of the Eligible Fixed Costs by methodology, as
19 presented in Attachment B. As discussed above, the Rental Method is the most appropriate
20 methodology for calculating marginal TSM costs. For this reason, SDG&E proposes that the
21 Rental Method be used to develop the Eligible Fixed Costs adopted in this proceeding.

22 This concludes my prepared direct testimony.

¹² D.17-09-035 at 60, OP 2.

¹³ D.17-09-035 at 44.

1 **V. STATEMENT OF QUALIFICATIONS**

2 My name is William G. Saxe. My business address is 8330 Century Park Court, San
3 Diego, California 92123. I am employed as Rates & Cost Studies Project Manager in the
4 Customer Pricing Department of SDG&E. 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
10 in 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 Federal Energy Regulatory
13 Commission (“FERC”) and the ICC.

ATTACHMENT A

SDG&E MARGINAL DISTRIBUTION CUSTOMER COSTS

ATTACHMENT A

SAN DIEGO GAS & ELECTRIC COMPANY ("SDG&E")
2018 RATE DESIGN WINDOW ("RDW"), APPLICATION ("A.") 17-12-XXX

SDG&E's Residential Marginal Distribution Customer Costs

Line No.	Customer Class (A)	Marginal Distribution Customer Costs ¹ (B)	Equal Percent of Marginal Costs ("EPMC") Distribution Customer Costs ² (C)	Line No.
1	Residential Marginal Customer Costs (\$/Customer-Month):			1
2	Rental Method ³	\$14.02	\$22.13	2
3	New Customer Only ("NCO") Method ⁴	\$9.17	\$16.32	3
4	Adjusted Rental Method #1 ("ARM1") Method ⁵	\$7.92	\$15.14	4
5	Adjusted Rental Method #2 ("ARM2") Method ⁶	\$11.57	\$19.64	5

Notes:

- (1) **Marginal Distribution Customer Costs:** the marginal distribution customer costs for the residential class.
- (2) **EPMC Distribution Customer Costs:** equals the Marginal Distribution Customer Costs multiplied by the EPMC factor based on SDG&E's current authorized distribution revenue requirement in rates effective December 1, 2017, per Advice Letter 3130-E-B.
- (3) **Rental Method:** proposed by SDG&E in its 2016 General Rate Case ("GRC") Phase 2 (A.15-04-012), Chapter 5 Rebuttal Testimony, updated to reflect (a) the current distribution revenue requirement effective December 1, 2017, per Advice Letter 3130-E-B and (b) the escalation of costs into 2020 dollars.
- (4) **NCO Method:** proposed by other parties in SDG&E's 2016 GRC Phase 2 (A.15-04-012), presented for illustrative purposes by SDG&E in Chapter 5 Rebuttal Testimony, Attachment E, updated to reflect: (a) the current distribution revenue requirement effective December 1, 2017, per Advice Letter 3130-E-B and (b) the escalation of costs in 2020 dollars.
- (5) **ARM1 Method:** proposed by the Energy Division in Pacific Gas & Electric Company's ("PG&E's") 2017 GRC Phase 2 (A.16-06013) on residential fixed costs that adjusts the Rental Method results for SDG&E's rate base.
- (6) **ARM2 Method:** proposed by the Energy Division in PG&E's 2017 GRC Phase 2 (A.16-06-013) on residential fixed costs that adjusts the Rental Method results for SDG&E's accumulated depreciation.

ATTACHMENT A

SAN DIEGO GAS & ELECTRIC COMPANY ("SDG&E")
2018 RATE DESIGN WINDOW ("RDW"), APPLICATION ("A.") 17-12-XXX

SDG&E's Residential Marginal Distribution Customer Costs Based on Rental Method

Line No.	Distribution Cost Components	Marginal Distribution Customer Costs 2020\$	Line No.
1	Transformer, Service and Meter ("TSM") Costs ¹		1
2			2
3	Transformers (0-2 kW)	\$603.31	3
4	Services (0-2 kW)	\$91.79	4
5	Meters	\$335.83	5
6			6
7	Subtotal	\$1,030.93	7
8			8
9	General Plant Loading at ²		9
10	2.27%		10
11	Working Capital Loading at ²		11
12	0.76%		12
13			13
14	Transformers	\$621.66	14
15	Services	\$94.58	15
16	Meters	\$346.05	16
17			17
18	Subtotal	\$1,062.28	18
19			19
20	Annualized Transformer Costs at 9.19% Real Economic Carrying Charges ("RECC") ³	\$57.15	20
21	Annualized Service Costs at 8.31% RECC ³	\$7.86	21
22	Annualized Meter Costs at 11.62% RECC ³	\$40.22	22
23	Annualized TSM Costs	\$105.22	23
24			24
25	Operations & Maintenance ("O&M") Expenses ⁴	\$32.68	25
26			26
27	Customer Service Expenses ⁵	\$30.37	27
28			28
29	Total (\$/Customer/Year)	\$168.28	29

Notes:

- (1) TSM Costs are the average residential costs presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 General Rate Case ("GRC") Phase 2 (A.15-04-012), escalated into 2020 dollars.
- (2) General Plant and Working Capital Loading factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (3) Annualized TSM Costs based on the RECC factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (4) O&M Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, including an adjustment for Miscellaneous Revenues, escalated into 2020 dollars. The O&M Expenses are developed based on applying an O&M loader to total residential TSM costs.
- (5) Customer Service Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, escalated into 2020 dollars.

ATTACHMENT A

SAN DIEGO GAS & ELECTRIC COMPANY ("SDG&E")
2018 RATE DESIGN WINDOW ("RDW"), APPLICATION ("A.") 17-12-XXX

SDG&E's Residential Marginal Distribution Customer Costs Based on New Customer Only ("NCO") Method

Line No.	Distribution Cost Components	Marginal Distribution Customer Costs 2020\$	Line No.
1	Transformer, Service and Meter ("TSM") Costs ¹		1
2	Transformers (0-2 KW)	\$603.31	2
3	Services (0-2 KW)	\$91.79	3
4	Meters	\$335.83	4
5	Replacements (w/o meter labor costs)	\$231.73	5
6			6
7			7
8	Subtotal	\$1,030.93	8
9	Subtotal for Replacements (w/o meter labor costs)	\$926.82	9
10			10
11	General Plant Loading at ²		11
12	2.27%		12
13	Working Capital Loading at ²		13
14	0.76%		14
15			15
16	Transformers	\$621.66	16
17	Services	\$94.58	17
18	Meters	\$346.05	18
19	Replacement Meters (w/o meter labor costs)	\$238.78	19
20			20
21	Subtotal	\$1,062.28	21
22	Subtotal for Replacements (w/o meter labor costs)	\$955.02	22
23			23
24	Present Value Revenue Requirement ("PVR") of TSM Costs		24
25	Transformers (388-1) at 130.93% ³	\$813.95	25
26	Services (369.2) at 130.75% ³	\$123.66	26
27	Meters (Average 370.11 & 370.21) at 112.35% ³	\$387.75	27
28	Replacement Meters (Average 370.11 & 370.21) at 112.35% ³	\$287.56	28
29			29
30	Subtotal	\$1,325.37	30
31	Subtotal for Replacements (w/o meter labor costs)	\$1,205.17	31
32			32
33	2016 Beginning Of Year Customers ⁴	1,268,280	33
34	New Customers ⁴	9,981	34
35	Replacement Customers ⁴	38,429	35
36			36
37	NCO TSM Component per 2016 Customer	\$46.95	37
38			38
39	Operations & Maintenance ("O&M") Expenses ⁵	\$32.68	39
40			40
41	Customer Service Expenses ⁶	\$30.37	41
42			42
43	Total \$(Customer/Year)	\$110.00	43

- Notes:
- (1) TSM Costs are the average residential costs presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers in SDG&E's 2016 General Rate Case ("GRC") Phase 2 (A.15-04-012), escalated into 2020 dollars.
 - (2) General Plant and Working Capital Loading factors presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
 - (3) PVR of TSM Costs based on the PVR factors presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
 - (4) 2016 Beginning of Year, New, and Replacement Customers presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
 - (5) O&M Expenses presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers, including an adjustment for Miscellaneous Revenues, escalated into 2020 dollars. The O&M Expenses are developed based on applying an O&M loader to total residential TSM costs.
 - (6) Customer Service Expenses presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers, escalated into 2020 dollars.

ATTACHMENT A

SAN DIEGO GAS & ELECTRIC COMPANY ("SDG&E")
2018 RATE DESIGN WINDOW ("RDW"), APPLICATION ("A.") 17-12-XXX

SDG&E's Residential Marginal Distribution Customer Costs Based on Adjusted Rental Method #1 ("ARM1")

Line No.	Distribution Cost Components	Marginal Distribution Customer Costs 2020\$	Line No.
1	Transformer, Service and Meter ("TSM") Costs ¹		1
2	Transformers (0-2 kW)	\$603.31	2
3	Services (0-2 kW)	\$91.79	3
4	Meters	\$335.83	4
5			5
6			6
7	Subtotal	\$1,030.93	7
8			8
9	General Plant Loading at ²		9
10	2.27%		10
11	Working Capital Loading at ²		11
12	0.76%		12
13			13
14	Transformers	\$621.66	14
15	Services	\$94.58	15
16	Meters	\$346.05	16
17			17
18	Subtotal	\$1,062.28	18
19			19
20	Annualized Transformer Costs at 9.19% Real Economic Carrying Charges ("RECC") ³	\$57.15	20
21	Annualized Service Costs at 8.31% RECC ³	\$7.86	21
22	Annualized Meter Costs at 11.62% RECC ³	\$40.22	22
23	Annualized TSM Costs	\$105.22	23
24	ARM1 Adjusted Annualized TSM Costs at 30% ⁴	\$31.96	24
25			25
26	Operations & Maintenance ("O&M") Expenses ⁵	\$32.68	26
27	Customer Service Expenses ⁶	\$30.37	27
28			28
29			29
30	Adjusted ARM1 Total (\$/Customer/Year)	\$95.01	30

Notes:

- (1) TSM Costs are the average residential costs presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 General Rate Case ("GRC") Phase 2 (A.15-04-012), escalated into 2020 dollars.
- (2) General Plant and Working Capital Loading factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (3) Annualized TSM Costs based on the RECC factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (4) ARM1 Adjusted Annualized TSM Costs at 30% is a TSM cost adjustment percentage equal to TSM rate base divided by TSM incremental costs.
- (5) O&M Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, including an adjustment for Miscellaneous Revenues, escalated into 2020 dollars. The O&M Expenses are developed based on applying an O&M loader to total residential TSM costs.
- (6) Customer Service Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, escalated into 2020 dollars.

ATTACHMENT A

SAN DIEGO GAS & ELECTRIC COMPANY ("SDG&E")
2018 RATE DESIGN WINDOW ("RDW"), APPLICATION ("A.") 17-12-XXX

SDG&E's Residential Marginal Distribution Customer Costs Based on Adjusted Rental Method #2 ("ARM2")

Line No.	Distribution Cost Components	Marginal Distribution Customer Costs 2020\$	Line No.
1	Transformer, Service and Meter ("TSM") Costs ¹		1
2	Transformers (0-2 kW)	\$603.31	2
3	Services (0-2 kW)	\$91.79	3
4	Meters	\$335.83	4
5			5
6	Subtotal	\$1,030.93	6
7			7
8	General Plant Loading at ²		8
9	2.27%		9
10	Working Capital Loading at ²		10
11	0.76%		11
12			12
13	Transformers	\$621.66	13
14	Services	\$94.58	14
15	Meters	\$346.05	15
16			16
17	Subtotal	\$1,062.28	17
18			18
19	Annualized Transformer Costs at 9.19% Real Economic Carrying Charges ("RECC") ³	\$57.15	19
20	Annualized Service Costs at 8.31% RECC ³	\$7.86	20
21	Annualized Meter Costs at 1.62% RECC ³	\$40.22	21
22	Annualized TSM Costs	\$105.22	22
23	ARM2 Adjusted Annualized TSM Costs at 72% ⁴	\$75.80	23
24			24
25	Operations & Maintenance ("O&M") Expenses ⁵	\$32.68	25
26			26
27	Customer Service Expenses ⁶	\$30.37	27
28			28
29			29
30	Adjusted ARM2 Total (\$/Customer/Year)	\$138.85	30

Notes:

- (1) TSM Costs are the average residential costs presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 General Rate Case ("GRC") Phase 2 (A.15-04-012), escalated into 2020 dollars.
- (2) General Plant and Working Capital Loading factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (3) Annualized TSM Costs based on the RECC factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (4) ARM2 Adjusted Annualized TSM Costs at 72% is a TSM cost adjustment percentage equal to the product of TSM incremental costs minus accumulated TSM depreciation divided by TSM incremental costs.
- (5) O&M Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, including an adjustment for Miscellaneous Revenues, escalated into 2020 dollars. The O&M Expenses are developed based on applying an O&M loader to total residential TSM costs.
- (6) Customer Service Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, escalated into 2020 dollars.

ATTACHMENT B

SDG&E ELIGIBLE FIXED COSTS

ATTACHMENT B

**SAN DIEGO GAS & ELECTRIC COMPANY ("SDG&E")
2018 RATE DESIGN WINDOW ("RDW"), APPLICATION ("A.") 17-12-XXX**

SDG&E's Residential Eligible Fixed Costs

Line No.	Customer Class (A)	Eligible Fixed Costs (\$/Customer/Month) ¹ (B)	Line No.
1	Residential Eligible Fixed Costs (\$/Customer-Month):		1
2	Rental Method ²	\$10.02	2
3	New Customer Only ("NCO") Method ³	\$6.50	3
4	Adjusted Rental Method #1 ("ARM1") Method ⁴	\$5.97	4
5	Adjusted Rental Method #2 ("ARM2") Method ⁵	\$8.39	5

Notes:

- (1) **Eligible Fixed Costs:** the residential costs eligible to be included in a fixed cost proposal, pursuant to Decision ("D.") 17-09-035.
- (2) **Rental Method:** Eligible Fixed Costs calculated based on the Rental Method.
- (3) **NCO Method:** Eligible Fixed Costs calculated based on the NCO Method.
- (4) **ARM1 Method:** Eligible Fixed Costs calculated based on the ARM1 Method.
- (5) **ARM2 Method:** Eligible Fixed Costs calculated based on the ARM2 Method.

ATTACHMENT B

**SAN DIEGO GAS & ELECTRIC COMPANY ("SDG&E")
2018 RATE DESIGN WINDOW ("RDW"), APPLICATION ("A.") 17-12-XXXX**

SDG&E's Residential Eligible Fixed Costs Based on Rental Method

Line No.	Distribution Cost Components	Eligible Fixed Costs Based on Rental Method 2020\$	Line No.
1	Transformer, Service and Meter ("TSM") Costs		1
2			2
3	Transformers (0-2 kW) ¹	\$246.28	3
4	Services (0-2 kW) ¹	\$74.22	4
5	Meters ²	\$335.83	5
6			6
7	Subtotal	\$656.33	7
8			8
9	General Plant Loading at ³		9
10	2.27%		10
11	Working Capital Loading at ³		11
12	0.76%		12
13			13
14	Transformers	\$253.77	14
15	Services	\$76.47	15
16	Meters	\$346.05	16
17			17
18	Subtotal	\$676.29	18
19			19
20	Annualized Transformer Costs at 9.19% Real Economic Carrying Charges ("RECC") ⁴	\$23.33	20
21	Annualized Services Costs at 8.31% ⁴	\$6.36	21
22	Annualized Meter Costs at 11.62% ⁴	\$40.22	22
23	Annualized TSM Costs	\$69.90	23
24			24
25	Operations & Maintenance ("O&M") Expenses ⁵	\$19.98	25
26			26
27	Customer Accounts/Services ⁶	\$30.37	27
28			28
29	Eligible Fixed Costs (\$/Customer/Year) - Based on Rental	\$120.25	29

Notes:

- (1) Transformer and Service Costs are the costs for 0-2 kW residential customers presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012), escalated into 2020 dollars.
- (2) Meters Costs are the average residential costs presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012), escalated into 2020 dollars.
- (3) General Plant and Working Capital Loading factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (4) Annualized TSM Costs based on the RECC factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (5) O&M Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, including an adjustment for Miscellaneous Revenues, escalated in 2020 dollars. The O&M Expenses are developed based on applying an O&M loader to 0-2 kW Transformer and Service and total Meter residential costs.
- (6) Customer Service Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, escalated into 2020 dollars.

ATTACHMENT B

**SAN DIEGO GAS & ELECTRIC COMPANY ("SDG&E")
2018 RATE DESIGN WINDOW ("RDW"), APPLICATION ("A.") 17-12-XXX**

SDG&E's Residential Eligible Fixed Costs Based on New Customer Only ("NCO") Method

Line No.	Distribution Cost Components	Eligible Fixed Costs Based on NCO Method 2020\$	Line No.
1	Transformer, Service and Meter ("TSM") Costs		1
2	Transformers (0-2 kW) ¹	\$246.28	2
3	Services (0-2 kW) ¹	\$74.22	3
4	Meters ²	\$335.83	4
5	Meter Replacements (w/o meter labor costs) ²	\$231.73	5
6			6
7			7
8	Subtotal	\$656.33	8
9	Subtotal for Replacements (w/o meter labor costs)	\$552.23	9
10			10
11	General Plant Loading at ³		11
12	2.27%		12
13	Working Capital Loading at ³		13
14	0.76%		14
15			15
16	Transformers	\$253.77	16
17	Services	\$76.47	17
18	Meters	\$346.05	18
19	Replacement Meters (w/o meter labor costs)	\$238.78	19
20			20
21	Subtotal	\$676.29	21
22	Subtotal for Replacements (w/o meter labor costs)	\$569.03	22
23			23
24			24
25	Present Value Revenue Requirement ("PVR") of TSM Costs	\$332.27	25
26	Transformers (368.1) at 130.93% ⁴	\$99.99	26
27	Services (369.2) at 130.75% ⁴	\$387.75	27
28	Meters (Average 370.11 & 370.21) at 112.35% ⁴	\$287.56	28
29	Replacement Meters (Average 370.11 & 370.21) at 112.35% ⁴		29
30	Subtotal	\$820.01	30
31	Subtotal for Replacements (w/o meter labor costs)	\$699.82	31
32			32
33	2016 Beginning Of Year Customers ⁵	1,266,280	33
34	New Customers ⁵	9,981	34
35	Replacement Customers ⁵	38,429	35
36			36
37	NCO TSM Component per 2016 Customer	\$27.66	37
38			38
39	Operations & Maintenance ("O&M") Expenses ⁶	\$19.98	39
40			40
41	Customer Accounts/Services ⁷	\$30.37	41
42			42
43	Eligible Fixed Costs (\$/Customer/Year) - Based on NCO	\$78.01	43

Notes:

- (1) Transformer and Service Costs are the costs for 0-2 kW residential customers presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012), escalated into 2020 dollars.
- (2) Meters Costs are the average residential costs presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012), escalated into 2020 dollars.
- (3) General Plant and Working Capital Loading factors presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (4) Transformer, Service, and Meter present value revenue requirement ("PVR") costs based on the PVR factors presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (5) 2016 Beginning of Year, New, and Replacement Customers presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (6) O&M Expenses presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers, including an adjustment for Miscellaneous Revenues, escalated into 2020 dollars. The O&M Expenses are developed based on applying an O&M loader to 0-2 kW Transformer and Service and total Meter residential costs.
- (7) Customer Service Expenses presented in Chapter 5 Rebuttal Testimony, Attachment E, Workpapers, escalated into 2020 dollars.

ATTACHMENT B

**SAN DIEGO GAS & ELECTRIC COMPANY ("SDG&E")
2018 RATE DESIGN WINDOW ("RDW"), APPLICATION ("A.") 17-12-XXX**

SDG&E's Residential Eligible Fixed Costs Based on Adjusted Rental Method #1 ("ARM1")

Line No.	Distribution Cost Components	Eligible Fixed Costs Based on ARM1 Method 2020\$	Line No.
1	Transformer, Service and Meter ("TSM") Costs		1
2	Transformers (0-2 kW) ¹	\$246.28	2
3	Services (0-2 kW) ¹	\$74.22	3
4	Meters ²	\$335.83	4
5			5
6	Subtotal	\$656.33	6
7			7
8	General Plant Loading at ³		8
9	2.27%		9
10	Working Capital Loading at ³		10
11	0.76%		11
12			12
13	Transformers	\$253.77	13
14	Services	\$76.47	14
15	Meters	\$346.05	15
16			16
17	Subtotal	\$676.29	17
18			18
19	Annualized Transformer Costs at 9.19% Real Economic Carrying Charges ("RECC") ⁴	\$23.33	19
20	Annualized Services Costs at 8.31% ⁴	\$6.36	20
21	Annualized Meter Costs at 11.62% ⁴	\$40.22	21
22	Annualized TSM Costs	\$69.90	22
23	ARM1 Adjusted Annualized TSM Costs at 30% ⁵	\$21.23	23
24			24
25	Operations & Maintenance ("O&M") Expenses ⁶	\$19.98	25
26			26
27	Customer Accounts/Services ⁷	\$30.37	27
28			28
29	Eligible Fixed Costs (\$/Customer/Year) - Based on ARM1	\$71.58	29
30			30

Notes:

- (1) Transformer and Service Costs are the costs for 0-2 kW residential customers presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012), escalated into 2020 dollars.
- (2) Meters Costs are the average residential costs presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012), escalated into 2020 dollars.
- (3) General Plant and Working Capital Loading factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (4) Annualized TSM Costs based on the RECC factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (5) ARM1 Adjusted Annualized TSM Costs at 30% is a TSM cost adjustment percentage equal to TSM rate base divided by TSM incremental costs.
- (6) O&M Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, including an adjustment for Miscellaneous Revenues, escalated in 2020 dollars. The O&M Expenses are developed based on applying an O&M loader to 0-2 kW Transformer and Service and total Meter residential costs.
- (7) Customer Service Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, escalated into 2020 dollars.

ATTACHMENT B

**SAN DIEGO GAS & ELECTRIC COMPANY ("SDG&E")
2018 RATE DESIGN WINDOW ("RDW"), APPLICATION ("A.") 17-12-XXX**

SDG&E's Residential Eligible Fixed Costs Based on Adjusted Rental Method #2 ("ARM2")

Line No.	Distribution Cost Components	Eligible Fixed Costs Based on ARM2 Method 2020\$	Line No.
1	Transformer, Service and Meter ("TSM") Costs		1
2	Transformers (0-2 kW) ¹	\$246.28	2
3	Services (0-2 kW) ¹	\$74.22	3
4	Meters ²	\$335.83	4
5			5
6	Subtotal	\$656.33	6
7			7
8			8
9	General Plant Loading at ³		9
10	2.27%		10
11	Working Capital Loading at ³		11
12	0.76%		12
13			13
14	Transformers	\$253.77	14
15	Services	\$76.47	15
16	Meters	\$346.05	16
17			17
18	Subtotal	\$676.29	18
19			19
20	Annualized Transformer Costs at 9.19% Real Economic Carrying Charges ("RECC") ⁴	\$23.33	20
21	Annualized Services Costs at 8.31% ⁴	\$6.36	21
22	Annualized Meter Costs at 11.62% ⁴	\$40.22	22
23	Annualized TSM Costs	\$69.90	23
24	ARM2 Adjusted Annualized TSM Costs at 72% ⁵	\$50.35	24
25			25
26	Operations & Maintenance ("O&M") Expenses ⁶	\$19.98	26
27			27
28	Customer Accounts/Services ⁷	\$30.37	28
29			29
30	Eligible Fixed Costs (\$/Customer/Year) - Based on ARM2	\$100.70	30

Notes:

- (1) Transformer and Service Costs are the costs for 0-2 kW residential customers presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012), escalated into 2020 dollars.
- (2) Meters Costs are the average residential costs presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012), escalated into 2020 dollars.
- (3) General Plant and Working Capital Loading factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (4) Annualized TSM Costs based on the RECC factors presented in Chapter 5 Rebuttal Testimony Workpapers in SDG&E's 2016 GRC Phase 2 (A.15-04-012).
- (5) ARM2 Adjusted Annualized TSM Costs at 72% is a TSM cost adjustment percentage equal to the product of TSM incremental costs minus accumulated TSM depreciation divided by TSM incremental costs.
- (6) O&M Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, including an adjustment for Miscellaneous Revenues, escalated in 2020 dollars. The O&M Expenses are developed based on applying an O&M loader to 0-2 kW Transformer and Service and total Meter residential costs.
- (7) Customer Service Expenses presented in Chapter 5 Rebuttal Testimony Workpapers, escalated into 2020 dollars.