Application of SAN DIEGO GAS & ELECTRIC COMPANY (U 902 E) For Authority To Update Marginal Costs, Cost Allocation, And Electric Rate Design.

Application 15-04-012
Exhibit No.: SDG&E-13

PREPARED REBUTTAL TESTIMONY OF

ROBERT B. ANDERSON

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

CHAPTER 3

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

August 30, 2016

TABLE OF CONTENTS

PREPARED REBUTTAL TESTIMONY OF

ROBERT B. ANDERSON

(CHAPTER 3)

I. PURPOSE AND OVERVIEW

The two purposes of my rebuttal testimony are to (1) reply to the opening testimony of Robert M. Fagan and Patrick Luckow of Synapse Energy Economics ("Synapse") on behalf of the Office of Ratepayer Advocates ("ORA") regarding their Loss of Load Expectation ("LOLE") modeling of San Diego Gas and Electric's ("SDG&E") Local Needs for Capacity in 2016, and (2) supplement the historical data. As described in the ORA direct testimony, Synapse's forecast supports SDG&E's proposed 4 p.m. - 9 p.m. on-peak time-of-use ("TOU" period on both weekdays and weekends.[1] However, for accuracy, I show that Synapse's analysis of the allocation of capacity is sensitive to their assumptions and that the assumptions Synapse made are not representative of the SDG&E system. This sensitivity to assumptions and the incorrect inputs, when corrected, provides additional support for the capacity allocation proposal of SDG&E witness Shaughnessy.

My testimony reaches the following conclusions regarding the Synapse LOLE modeling:

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[1] ORA Testimony, page 4-3, lines 15-19. A significant amount of the capacity allocation is to the summer weekend hours of 4 p.m. – 9 p.m. ORA workpapers show 60.2% of the capacity allocation is in the 4 p.m. – 9 p.m. time period for all days with 44.1% on weekdays, indicating 16.1% is on weekends. Thus 26.7% (16.1% divided by 60.2% = 26.7%) of the 4 p.m. – 9 p.m. capacity allocation is in weekends. It should be noted that weekends make up about 28.6% of the days of the week (2 days/7 days per week). Thus, the ORA analysis shows it is almost just as likely to need capacity on weekends as on weekdays.

- The level of small scale photovoltaics ("PV") and utility-scale solar assumed by Synapse in 2016 substantially underestimates the solar resources already delivering to SDG&E's service area.
- Synapse's assumed level of wind resources to be delivered to SDG&E in 2016 overestimates the amount of wind delivering to SDG&E service area.
- The level of assumed imports is not representative of local area conditions and may produce results not related to SDG&E capacity shortages.
- Correcting these flaws in the ORA analysis yields results supporting assignment of most marginal capacity costs to the summer on-peak period.

II. RELATIVE LOSS OF LOAD EXPECTATION MODELING

To identify the periods when there is a likelihood of needing additional resources, SDG&E undertook two LOLE analyses - one for the San Diego sub area and one for the San Diego Greater Reliability area. SDG&E determined the LOLE for the SDG&E system using the Ventyx Planning and Risk model, a system dispatch model with inputs tailored to the SDG&E system. In order to model uncertainties, different load and variable renewable production levels are generated by a stochastic process based on historical data. The Planning and Risk model then performs an hourly economic dispatch of generation resources that exist or are expected to be constructed by 2016 in the San Diego Greater Reliability area against loads for each hour of the year. The resulting analysis is not a measure of need for new capacity, but instead determines, if there were a need, what hours of the year would likely experience the highest likelihood of a loss of load. By running the model multiple times, a probability distribution of hours with relative expected loss of load can be developed.

In contrast, Synapse used a spreadsheet model that includes generation resources in the San Diego Greater Reliability area and compared these generation resources against loads for each hour of the year.[2] However, the renewable resource mix was not based on those physically located in the San Diego Greater Reliability area, but rather comprised an allocation of a statewide renewable resource mix. This set of assumptions differs from SDG&E's assumptions in that it provides less specificity about the operating characteristics of the generation units in the San Diego area. Like SDG&E's modeling, the ORA modeling does not determine the absolute need for new capacity, but determines what hours of the year would likely experience the highest likelihood of a loss of load.

The difference between the two model's results are mainly due to the data inputs used by Synapse and thus the Synapse Loss of Load Probability ("LOLP") results and resulting capacity allocation percentages are not representative of SDG&E's system due to the faulty assumptions.

III. MODELING ASSUMPTIONS

SDG&E does not dispute the ORA modeling assumptions made for the California Independent System Operator ("CAISO") as a whole and agrees with the analysis that finds that 96.8 percent of the LOLP for the entire CAISO area falls within the hours of 4 p.m. to 9 p.m. in the summer (including both weekdays and weekends).[3] The data relied on by Synapse (CAISO's PLEXOS 2024 database adjusted to 2016) is appropriate for use in a statewide LOLP analysis. However, as described in detail below, Synapse's reliance on the

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[2] ORA workpaper spreadsheets: ORA_Testimony_Chapter_4_LOLP_(Modeling Results).xlsm, STEP ONE – SDGE Net Load 2016_021716.xlsm, STEP TWO – SDGE Resource Availability 2016_022416.xlsm, and STEP THREE – SDGE LOLE Calcualtion_022416_split trans.xlsm.

[3] ORA Workpapers, CAISO 2016 model results.

statewide CAISO PLEXOS database and adjustments to the statewide data for analysis of the SDG&E service area is faulty and provides inaccurate model inputs and incorrect results.

A. Hourly Load Profiles

As described in the rebuttal testimony of SDG&E witness Schiermeyer, the 2024 CAISO load profiles relied on by Synapse are not representative of SDG&E loads excluding behind-the-meter solar.[4] The CAISO did not conduct a detailed study of individual utility service areas because it was not the focus of their analysis.[5]

B. Quantity of Solar and Wind Energy

Synapse's assumption of the amount of solar generation grossly underestimates the amount of actual solar deliveries expected in 2016. Conversely, the Synapse assumption regarding wind generation being delivered to SDG&E customers in 2016 is an overestimate. The amount of solar generation drives the net peak to later in the day, so the Synapse underestimate of solar generation prevents Synapse from fully capturing the shift in net peak and associated need for capacity to later in the day. Likewise, the overestimate of wind resources shifts the LOLP to earlier in the day as wind production increases in evening and night hours.

For behind-the-meter solar generation, Synapse assumed 453 MW.[6] However, based on data filed with the California Public Utilities Commission, SDG&E already has over 600 MW of behind-the-meter solar in 2016.[7]

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[4] See the rebuttal testimony of SDG&E witness Schiermeyer, Chapter 4 (at pp. KES-3 and KES-4).

[5] The CAISO analysis for the Long-term Procurement Proceeding was to determine statewide needs for capacity.

[6] ORA testimony, page A-5.

[7] SDG&E's monthly net energy metering progress report provided to the Commission in Advice Letter 2920-E, dated July 11, 2016, is included as Attachment A.

For other solar, Synapse assumed 625 MW of solar based on de-rating the CAISO 2024 PLEXOS database renewable assumptions based on 2016 RPS requirements.[8] But SDG&E has surpassed the RPS minimum requirements and in 2014 met 32 percent of retail sales with RPS resources and 36 percent in 2015, including a substantial amount of solar energy.[9] In 2016, SDG&E has over 1,000 MWs of solar energy under contract delivering energy in the SDG&E Greater Reliability area.[10] Thus, the ORA analysis was based on slightly less than 1,100 MW of total solar, when SDG&E actually has over 1,600 MW of solar delivering energy, 45% more than Synapse modeled.

In addition to the inaccuracy regarding the number of MWs of solar, Synapse uses a CAISO generic solar production profile that underestimates the solar production of the facilities in SDG&E's area in the 2 p.m. to 4 p.m. time period when compared to the historical solar production data at these facilities.[11] SDG&E used a solar profile based on actual production data from the specific facilities it modeled.

For wind resources, Synapse assumed 747 MW of wind based on de-rating the CAISO 2024 PLEXOS database renewable assumptions on 2016 RPS requirements.[12]

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[8] ORA's July 26, 2016 Response to SDG&E Data Request 01 (Responses 4d and 6a). The ORA data request response is included as Attachment B.

[9] For 2014, California Public Utilities Commission, Renewables Portfolio Standard Quarterly Report, 1st Quarter 2016, page 2. For 2015, The Padilla Report to the Legislature Reporting 2015 Renewable Procurement Costs in Compliance with Senate Bill 836 (Padilla, 2011), May 2016, figure 1, page 2.

[10] SDG&E assumed 1,032 MW of solar in its analysis, of which 1,006 were delivering energy as of the beginning of the year.

[11] For example, SDG&E estimates that the July 2016 forecast of Synapse underestimates the expected solar production in the 3 p.m. – 4 p.m. hour by more than 100 MW solely due to differences in hourly production profiles.

[12] ORA Data Request 1, Response 6.

While SDG&E has substantial wind resources under contract, only 471 MW are in the SDG&E Greater Reliability Area and are delivering to SDG&E customers.[13]

Synapse's underestimate of solar resources (by over 500 MW), employment of inaccurate solar production profiles and overestimate of wind resources (by over 250 MW) directly impacts the times when expected capacity would be needed and leads to erroneous conclusions regarding capacity allocation.

C. Other Model Assumptions

The Synapse analysis of the SDG&E area assumes that 3,500 MWs of imports are simultaneously available at all times (excluding random forced outages) in addition to over 4,200 MW of fossil resources and demand response.[14] Thus, ORA's model had over 7,700 MW of resources available to serve a peak load ranging from 4,700 to 5,800 MW in various scenarios. With that large amount of resources, Synapse had to increase SDG&E loads by 37 percent to find a LOLP solution meeting the reliability criteria.[15] It is unclear exactly what the results of Synapse's analysis show given the unrealistic increase in loads required; however, it does raise the issue of whether their analysis is showing SDG&E's specific hours of capacity need.

The Synapse model also included a planned maintenance outage rate for each of the fossil resources and demand response. The impact of including planned maintenance is to create a loss of load expectation during those planned outages. In actual operation, planned maintenance is coordinated between plant owners and the CAISO to occur in hours that

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[13] 471 MW was assumed for the SDG&E analysis based on projects already delivering energy.
[14] ORA workpapers, LOLE model input file "STEP TWO - SDGE Resource Availability_2016_021816.xlsm."
[15] ORA workpapers, ORA_Testimony_Chapter_4_(Modeling_Results).xlsm.

would minimize any impact on reliability. SDG&E's analysis eliminated the planned outages in the analysis to focus on hours when added capacity would be needed.

IV. MODELING RESULTS WITH CHANGED ASSUMPTIONS

SDG&E has rerun the spreadsheet tool that ORA used with the following corrected assumptions that better model the SDG&E system:

1) Loads are based on SDG&E-specific load data with a higher level of behind-the-meter renewables (loads are modeled as net of behind-the-meter renewables and taken from 30 random model runs from the SDG&E LOLE analysis).
2) The load multiplier used by ORA was set equal to 1, thus loads were not "extended" to drive periods of shortages.
3) 1,032 MW of existing utility scale solar from SDG&E's base forecast (used in SDG&E's model runs) with solar production profiles based on historical experience.
4) 471 MW of existing wind from the SDG&E base forecast (used in SDG&E's model runs) with wind production profiles based on historical experience.
5) No planned outages (assumption used in SDG&E's model runs).
6) 1,400 MW limit on transmission imports to achieve the same level of reliability as the ORA modeling.

The spreadsheet tool results with this more accurate data supports the LOLE analysis conducted by SDG&E with capacity allocation primarily in September, consistent with SDG&E's experience, and capacity allocation primarily to the 4 p.m. to 9 p.m. hours during the summer months. Table 1 below provides a comparison of the spreadsheet model output

of ORA with ORA's assumptions and with revised, more accurate assumptions for the SDG&E service area.

Table 1. Comparison of the Allocation of Marginal Capacity Costs to TOU Periods with Changes in Assumptions

	ORA Spreadsheet Model			
	ORA Assumptions		SDG&E Assumptions	Top 100 Hours[16]
	CAISO Area	SDG&E Service Area	SDG&E Service Area	SDG&E Service Area
4 p.m. - 9 p.m. Summer	96.8%	60.2%	87.5%	76.7%
4 p.m. - 9 p.m. Winter	0.0%	11.9%	0.4%	0.0%
Other	3.2%	28.0%	12.1%	23.3%

V. DATA SUPPLEMENT

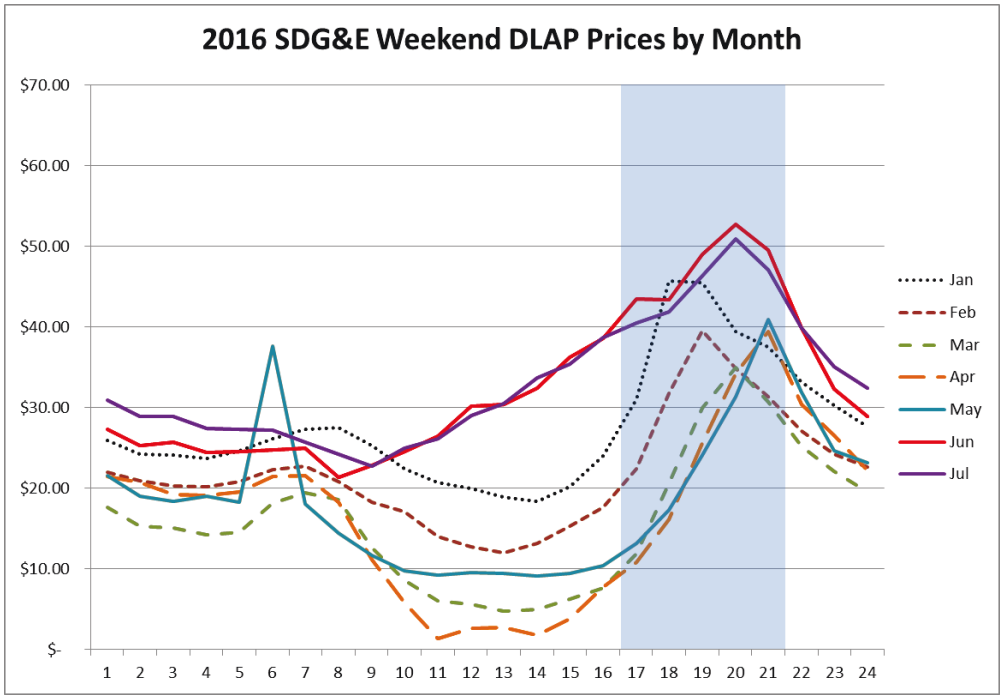
Since the time my direct testimony was submitted, additional historical data on CAISO net loads and SDG&E default load aggregation point ("DLAP") energy prices has become available. This data provides further support for SDG&E's proposal to change its on-peak TOU period to 4 p.m. to 9 p.m.

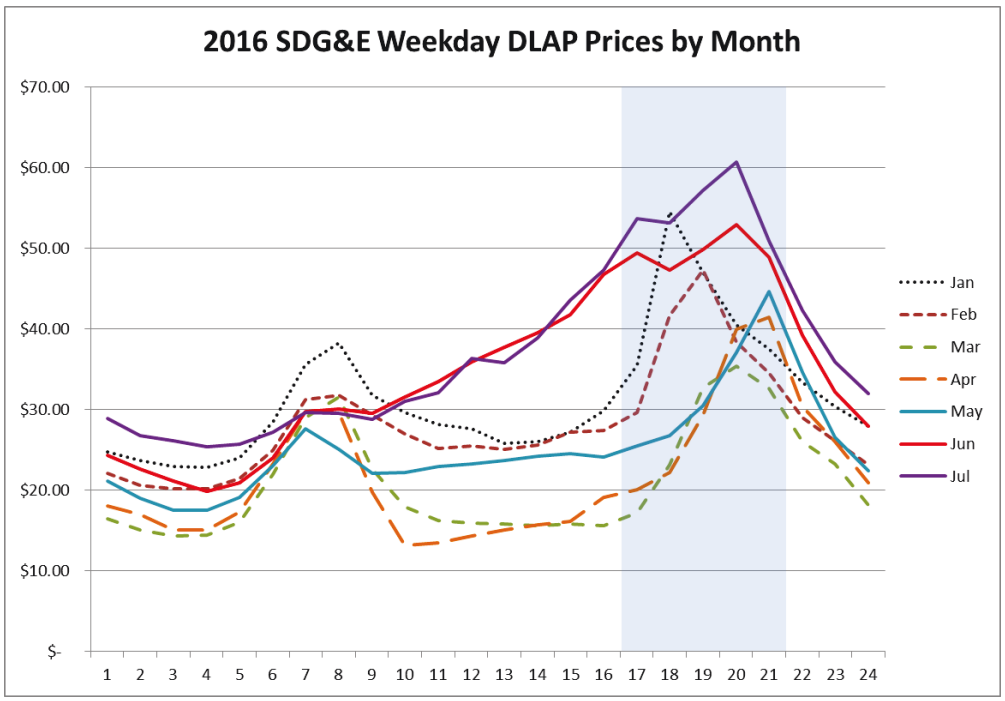
A. 2016 SDG&E Hourly DLAP Price Data

The following provides additional historical price data in graphical form for weekday and weekends by month, a supplement to Charts RBA-5, RBA-6, RBA-9 and RBA-10 from my direct testimony. Winter months are shown as dashed lines and summer months as solid lines.

[16] See the February 9, 2016 direct testimony of Jeffrey J. Shaughnessy at Table JJS-5 at p. JJS-10.

Chart RBA-Rebuttal-1 2016 SDG&E DLAP Prices by Month

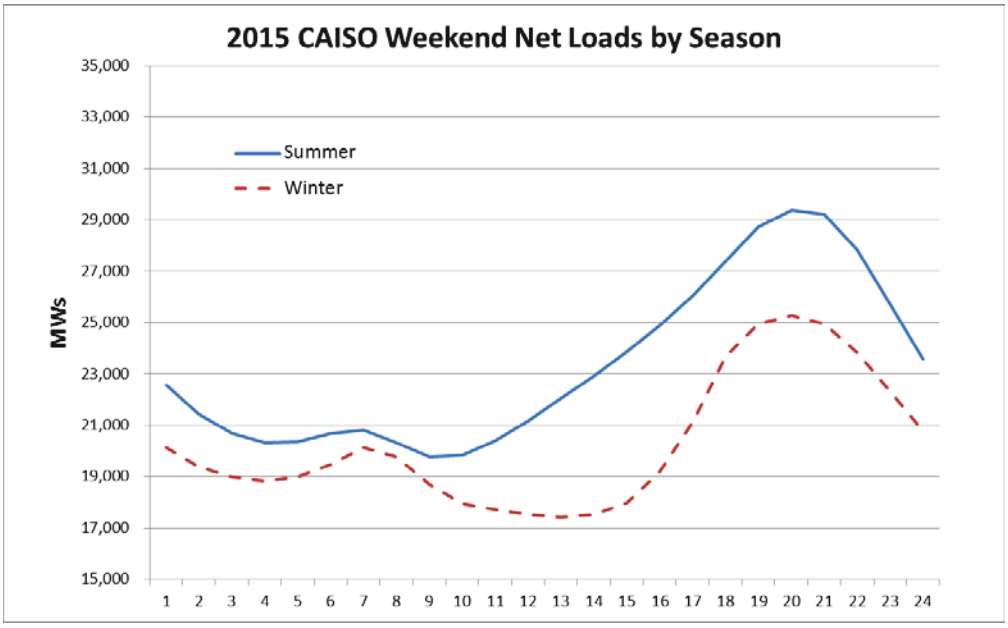


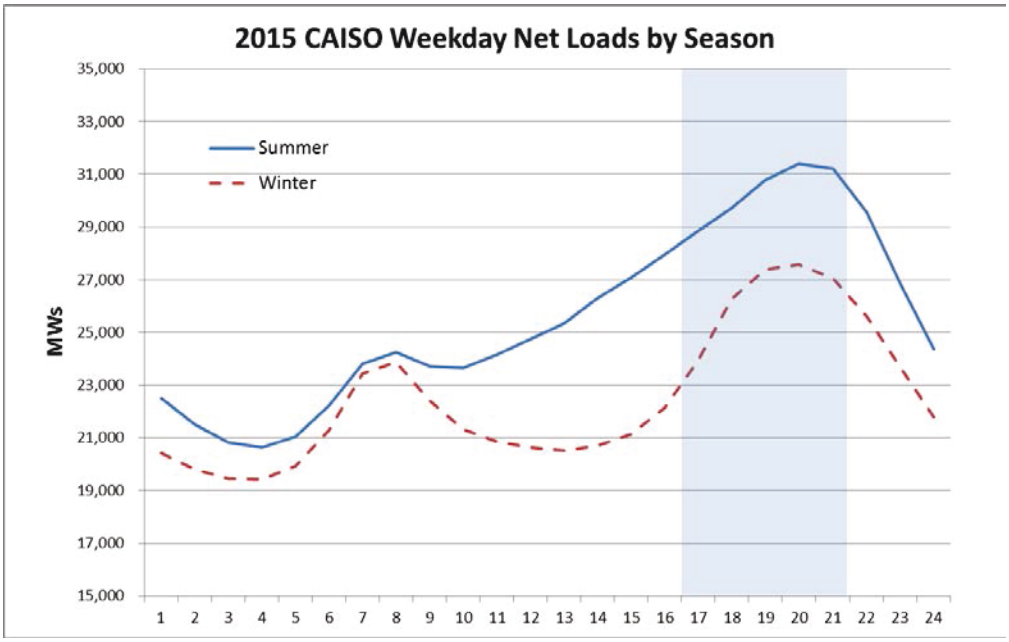


B. 2015 CAISO Net Load Data

The following chart supplements the data in Charts RBA-3 and RBA-4 in my direct testimony showing the CAISO Weekday Net Loads for both summer (May-October) and winter (November-April) for 2015. In addition, the 2015 CAISO Weekend Net Loads are provided that again emphasize that 4 p.m. to 9 p.m. on-peak period should include weekend days.

Chart RBA-Rebuttal-2: 2015 CAISO Net Loads by Season





VI. CONCLUSION

This concludes my prepared rebuttal testimony.

ATTACHMENT A

SDG&E ADVICE LETTER 2920-E (JULY 11, 2016)

Clay Faber - Director
Federal & CA Regulatory
8330 Century Park
San Diego, CA 92123

cfaber@semprautilities.com

July 11, 2016

ADVICE LETTER 2920-E
(U-902-E)

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

SUBJECT: INFORMATION ONLY -- PROGRESS TOWARDS THE NET ENERGY METERING TRANSITION TRIGGER LEVEL IN COMPLIANCE WITH DECISION 14-03-041

PURPOSE

This advice letter is filed in compliance with Ordering Paragraph (OP) 7 of Decision (D.) 14-03-041, which requires San Diego Gas & Electric Company (SDG&E) to report its progress towards the Net Energy Metering (NEM) transition trigger level to the California Public Utilities Commission (Commission) on a monthly basis.

BACKGROUND & DISCUSSION

On March 27, 2014, the Commission approved D.14-03-041; Decision Establishing a Transition Period Pursuant to Assembly Bill 327 for Customers Enrolled in Net Energy Metering Tariffs. Among other things, this Decision orders the California investor-owned utilities (IOUs) to "report their progress towards the Net Energy Metering (NEM) transition trigger level to the Commission on a monthly basis, as required by Public Utilities Code Section 2827(c)(4)(C)."[1] This report shall include the information required in statute, including updated information on progress toward the NEM limits, as well as the amount remaining before the NEM transition trigger level is reached. These monthly reports shall also be posted on each utility's Web site along with other information about NEM. The IOUs shall work with the Commission's Energy Division staff to develop the content and format for these monthly reports, as well as to develop an annual summary report.[2]

In accordance with the Commission's directive, the IOUs collaborated with Energy Division staff to create a monthly report. Energy Division staff also provided the IOUs instructions to submit the monthly reports via an information-only advice filing pursuant to General Order (GO) 96-B, Energy Industry Rule, Section 6.

In compliance with D.14-03-041 and Energy Division's directive, SDG&E hereby files this Advice Letter (AL) and report. SDG&E's report towards the NEM transition trigger level, which is provided below, is as of June 29, 2016. SDG&E's website has also been updated. For general information on NEM, please visit http://www.sdge.com/nem. For a web-based copy of the report, please visit http://www.sdge.com/clean-energy/net-energy-metering/overview-nem-cap.

[1] OP 7 of D.14-03-041.
[2] *Id.*

Monthly AB 327 Net Energy Metering (NEM) Program Limit Report [1]

Data updated as of June 29, 2016

Total Available Megawatts (MW) Cap	617 MW		5% of 12,340 MW
	#	MWs	
Applications Received in June 2016 (New requests for NEM interconnection)	2,995	24.4	
Total NEM Applications in Queue as of June 2016 (Total pending requests for NEM interconnection)	2,018	36.0	
Cumulative NEM Installations[2] (Projects approved for NEM interconnection)	93,076	611.4	
NEM Installations and Applications in Queue (Cumulative MW Installed under NEM + NEM MW in Queue)	95,094	647.4	**Percentage** 5.25%
Remaining MW to Cap (NEM Cap minus Cumulative MW installed under NEM + NEM MW in Queue)		**(30.4)**	

NOTES:

[1]The purpose of this report is to adhere to Public Utilities (PU) Code Section 2827(c)(4)(C), which directs each large electrical corporation to file a monthly report with the California Public Utilities Commission detailing the progress toward the NEM program limit. This report includes all systems either seeking interconnection or interconnected under the NEM program pursuant to PU Code Section 2827 (e.g., solar, wind, fuel cells using renewable fuels, etc.)

[2]Includes cumulative installations approved for NEM interconnection since NEM inception in 1996 (does not include systems that terminated NEM interconnection with the utility).

ANNUAL SUMMARY REPORT

CPUC Decision 14-03-041, Ordering Paragraph 7 directs the IOUs to report their progress towards the NEM cap on a monthly basis and to post the information on their respective websites. Additionally, the ordering paragraph directs the IOUs to "develop an annual summary report".

The IOUs have been filing the above-referenced monthly reports on the 10th of each month. In addition, every October 1, the IOUs file an annual update to the denominator of the NEM cap pursuant to a 2012 Assigned Commissioner's Ruling which updates the cap target and progress towards meeting that target.

SDG&E believes that the monthly reports, which include cumulative data, coupled with the annual October 1 filings fulfill the annual summary report requirement in D.14-03-041. Therefore, SDG&E does not intend to file a separate annual report.

EFFECTIVE DATE

SDG&E believes this Advice Letter is subject to Energy Division disposition and should be classified as Tier 1 (effective pending disposition) pursuant to GO 96-B. This filing is pursuant to OP 7 of D.14-03-041 and therefore SDG&E requests this advice letter become effective July 11, 2016, the date filed.

PROTEST

In accordance with GO 96-B Section 6.2, this information-only filing is not subject to protest.

NOTICE

A copy of this filing has been served on the utilities and interested parties shown on the attached list, including interested parties in R.12-11-005 and R.14-07-002, by providing them a copy hereof either electronically or via the U.S. mail, properly stamped and addressed.

Address changes should be directed to SDG&E Tariffs by e-mail at SDG&ETariffs@semprautilities.com.

_____
CLAY FABER
Federal & CA Regulatory

CALIFORNIA PUBLIC UTILITIES COMMISSION

ADVICE LETTER FILING SUMMARY
ENERGY UTILITY

MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No. **SAN DIEGO GAS & ELECTRIC (U 902)**

Utility type:
☒ ELC ☐ GAS
☐ PLC ☐ HEAT ☐ WATER

Contact Person: Joff Morales
Phone #: (858) 650-4098
E-mail: jmorales@semprautilities.com

EXPLANATION OF UTILITY TYPE
ELC = Electric GAS = Gas
PLC = Pipeline HEAT = Heat WATER = Water

(Date Filed/ Received Stamp by CPUC)

Advice Letter (AL) #: 2920-E

Subject: Information Only – Progress Towards the Net Energy Metering Transition Trigger Level in Compliance with Decision 14-03-041

Keywords (choose from CPUC listing): NEM

AL filing type: ☐ Monthly ☐ Quarterly ☐ Annual ☐ One-Time ☒ Other

If AL filed in compliance with a Commission order, indicate relevant Decision/Resolution #:
D.14-03-041

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: N/A

Summarize differences between the AL and the prior withdrawn or rejected AL[1]: N/A

Does AL request confidential treatment? If so, provide explanation: No

Resolution Required? ☐ Yes ☒ No

Tier Designation: ☒ 1 ☐ 2 ☐ 3

Requested effective date: 07/11/2016

No. of tariff sheets: 0

Estimated system annual revenue effect: (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected: None

Service affected and changes proposed[1]: N/A

Pending advice letters that revise the same tariff sheets: N/A

Protests and all other correspondence regarding this AL are due no later than 20 days after the date of this filing, unless otherwise authorized by the Commission, and shall be sent to:

CPUC, Energy Division
Attention: Tariff Unit
505 Van Ness Ave.,
San Francisco, CA 94102
EDTariffUnit@cpuc.ca.gov

San Diego Gas & Electric
Attention: Megan Caulson
8330 Century Park CT
San Diego, CA 92123
mcaulson@semprautilities.com

General Order No. 96-B
ADVICE LETTER FILING MAILING LIST

cc: (w/enclosures)

Public Utilities Commission
DRA
S. Cauchois
R. Pocta
W. Scott
Energy Division
P. Clanon
S. Gallagher
M. Ghadessi
Tariff Unit
CA. Energy Commission
F. DeLeon
R. Tavares
Alcantar & Kahl LLP
K. Cameron
American Energy Institute
C. King
APS Energy Services
J. Schenk
BP Energy Company
J. Zaiontz
Barkovich & Yap, Inc.
B. Barkovich
Bartle Wells Associates
R. Schmidt
Braun & Blaising, P.C.
S. Blaising
California Energy Markets
S. O'Donnell
C. Sweet
California Farm Bureau Federation
K. Mills
California Wind Energy
N. Rader
Children's Hospital & Health Center
T. Jacoby
City of Poway
R. Willcox
City of San Diego
L. Cosio Azar
D. Weil
F. Ortlieb
B. Henry
Commerce Energy Group
V. Gan
CP Kelco
A. Friedl
Davis Wright Tremaine, LLP
E. O'Neill
J. Pau
Dept. of General Services
H. Nanjo
M. Clark
Douglass & Liddell
D. Douglass
D. Liddell
G. Klatt
Duke Energy North America
M. Gillette
Dynegy, Inc.
J. Paul
Ellison Schneider & Harris LLP
E. Janssen
Energy Policy Initiatives Center (USD)
S. Anders
Energy Price Solutions
A. Scott
Energy Strategies, Inc.
K. Campbell
M. Scanlan
Goodin, MacBride, Squeri, Ritchie & Day
B. Cragg
J. Heather Patrick
J. Squeri
Goodrich Aerostructures Group
M. Harrington
Hanna and Morton LLP
N. Pedersen
Itsa-North America
L. Belew
J.B.S. Energy
J. Nahigian
Luce, Forward, Hamilton & Scripps LLP
J. Leslie
Manatt, Phelps & Phillips LLP
D. Huard
R. Keen
Matthew V. Brady & Associates
M. Brady
Modesto Irrigation District
C. Mayer
Morrison & Foerster LLP
P. Hanschen
MRW & Associates
D. Richardson
Pacific Gas & Electric Co.
J. Clark
M. Huffman
S. Lawrie
E. Lucha
Pacific Utility Audit, Inc.
E. Kelly
San Diego Regional Energy Office
S. Freedman
J. Porter
School Project for Utility Rate Reduction
M. Rochman
Shute, Mihaly & Weinberger LLP
O. Armi
Solar Turbines
F. Chiang
Sutherland Asbill & Brennan LLP
K. McCrea
Southern California Edison Co.
M. Alexander
K. Cini
K. Gansecki
H. Romero
TransCanada
R. Hunter
D. White
TURN
M. Hawiger
UCAN
D. Kelly
U.S. Dept. of the Navy
K. Davoodi
N. Furuta
L. DeLacruz
Utility Specialists, Southwest, Inc.
D. Koser
Western Manufactured Housing Communities Association
S. Dey
White & Case LLP
L. Cottle
Service List
R.12-11-005
R.14-07-002

ATTACHMENT B

ORA'S JULY 26, 2016 RESPONSE TO SDG&E DATA REQUEST 01

ORA Response to

SDG&E Data Request Number SDGE-ORA-01
SDG&E SECOND AMENDED GRC Phase 2 APPLICATION – A.15-04-012

DATE: **July 26, 2016**

TO: Lee-Whei Tan and Dexter Khoury
Office of Ratepayer Advocates
Project Coordinators

Greg Heiden
Office of Ratepayer Advocates
Attorney

FROM: Will Fuller
San Diego Gas & Electric
8330 Century Park Court, CP32F
San Diego, CA 92123-1548

PHONE: 858-654-1885
E-Mail: wfuller@semprautilities.com

Request No: **SDG&E Data Request 1 (SDGE-ORA-01)** **Due Date: July 29, 2016**

Subject: **ORA LOLE Modeling**

Please provide the following information as it becomes available but no later than the due date. If you are unable to provide the information by this date, please provide a written or verbal explanation why the response date cannot be met and your best estimate of when the information can be provided. Please electronically mail all responses that can be transmitted electronically to me (wfuller@semprautilities.com) and Steve Nelson (SNelson@sempra.com). If attachments cannot be electronically transmitted, please notify me via e-mail or phone, and arrangements will be made for the transmittal of said attachments.

REQUEST:

1. At page 3-17 of the ORA testimony, footnotes 45 and 47, ORA states that Ventyx' Planning and Risk model is a "spread sheet based model."
    a. Please provide the basis for this statement.

       This statement is incorrect. While both models can produce LOLE estimations, Planning and Risk is not a spreadsheet-based tool.

    b. Please explain why ORA used the SCE model instead of a production cost model such as the PLEXOS model it used for the marginal energy cost forecast? Or the SERVM model used in the cited CES-21 work?

       While the PLEXOS model can be configured to produce LOLE estimations, it is not configured as such by CAISO in the LTPP process, which was the database used as the baseline for the Synapse

analysis. Synapse believes the transparent framework provided by the Excel-based LOLE model provides accurate information to inform the analysis presented in the ORA testimony.

2. At page 4-9 of the ORA testimony, line 23-26, ORA states that it "use the SDG&E system results for MCC allocation because they better represent the actual topology of the SDG&E system,…" Please provide a clear definition as to what "topology of the SDG&E system" means.
    a. Is the analysis for the SDG&E Greater Reliability area (i.e. including Imperial Valley resources)?

       The analysis presented in our testimony is for the SDGE system itself, not including resources identified as located in the IID region in the PLEXOS database.

    b. Is the level of imports ORA used in its LOLE analysis into the SDG&E area a total of 3500 MW (excluding periods during transmission forced outages)?

       Yes. Synapse assumed 3500MW of imports, as two independent transmission paths for outage purposes.

    c. Are all resources dynamically connected to the CAISO in the Greater Reliability area intended to be included?

       All resources in the CAISO PLEXOS database for the SDGE region were included. This does not include resources located in IID.

3. Is the 2016 ORA LOLE modeling specific to SDG&E based on 2016 forecast data? If not, please provide a list of the data based on other forecast years and whether they are adjusted to 2016. If adjusted, please indicate how adjusted. [Workpapers show resources are based on 2017 data, and most other data are based on 2020 or 2024]

   Load forecasts are based on 2016 data. Please refer to Appendix A of the ORA testimony for adjustments to the CAISO LTPP dataset for 2024.

4. How were the 8,760 hours of loads used in the ORA LOLE modeling specific to SDG&E created for each of the 30 weather scenarios? [The workpapers have hard-coded numbers for load for each weather scenario.]
    a. Please provide the base 2016 SDG&E load forecast and the source for the 2016 forecast if a base forecast is used.

The base load forecast is available in the workpaper "STEP ONE -SDGE Net Load 2016_021716.xlsm", worksheet "Load", column E. This hourly forecast was developed based on the IEPR 2015 load forecast. This is document on page A-4 of our testimony.

b. Please provide the analysis including formula and data used to make each load forecast for the 8,760 hours for the 30 weather years.

See the supplied workpaper "SDGE 2016 Loads.xlsx". The methodology behind the development of these forecasts is documented on page A-7 of the ORA testimony

c. Is the 2016 load forecast net of roof-top solar or is rooftop solar treated as a generation source in the ORA LOLE modeling?

Rooftop solar resources are modeled as a generation resource.

d. If the 2016 forecast is net of rooftop solar, what MWs of roof-top solar were assumed in the 2016 base forecast?

Rooftop solar capacity was assumed to be 453MW, based on IEPR Form 1.4-Mid. See page A-4 and Table A-4 of ORA testimony.

5. Does the ORA LOLE modeling assume that there is always energy available to completely use 3500 MW of assumed transmission (except during forced outages)?
   a. Did ORA conduct any analysis of limitations on imports in peak regional conditions? If so, please provide the analysis.

   No.

   b. What was the basis for splitting the transmission imports into two lines of 1750 MW?

   To capture the interrelated nature of transmission paths into SDGE, and to respect the "simultaneous import" capability into the SDGE region, we reduced the total flow amount allowed in the PLEXOS database, and then assumed two major import paths to represent that – from the east, and from the north – splitting the 3500 MW simultaneous import into two 1750 MW import paths. We conservatively ignored the additional import capacity from Mexico.

   c. Did ORA conduct any LOLE analysis assuming an N-2 condition (loss of 2 largest transmission lines) that the CAISO uses to determine local resource needs?

   No.

ORA Response to

SDG&E Data Request Number SDGE-ORA-01
SDG&E SECOND AMENDED GRC Phase 2 APPLICATION – A.15-04-012

6. What renewables are included in local generation available to SDG&E used in the ORA LOLE modeling specific to SDG&E for 2016?
    a. What were the amounts of MWs of renewable energy assumed for 2016 by type? Please provide a complete list of renewable resources included in the analysis and their nameplate MWs.
    ORA used the same large scale renewable energy assumptions as used in our testimony in Docket A.14-11-014. We de-rated the CAISO database renewable assumptions based on annual RPS requirements. In the SDGE territory, this resulted in 238MW of Existing Solar PV, 71MW of Small Solar PV, 316MW of Large Solar PV, 49MW of biomass, 13MW of small hydro, and 747MW of Wind.

    b. Describe how the forecasted hourly production profiles of the solar and wind generation in the local area were developed. If historical data was used, please provide the source of this data. If not, please provide the basis of the solar and wind profiles.

    The same hourly production profiles were used as those used by CAISO in the LTPP database.

    c. Were the wind and solar energy deliveries treated as deterministic or stochastic? If stochastic, please provide the stochastic variables (correlation, short term mean reversion rate, and short term volatility rate) or the data for the renewable energy production draws.

    The spreadsheet model takes a simplified stochastic approach. As an input, the model is provided with an 8760 profile of aggregate wind generation, as well as aggregate solar generation. For each iteration, it selects a random "Wind Day" and "Solar Day" within the given month. These days are not necessarily the same. It matches this with one of thirty random load profiles for the given day to calculate a resulting net load, by hour.

7. What fossil generation was assumed available as local generation available to SDG&E in the ORA LOLE modeling specific to SDG&E for 2016?
    a. Is the list in the fossil generation in Resources tab of the Step 2 worksheet complete?

    The Step Two resources tab represents all fossil generation that was included in the model.

    b. If the list is complete, please explain why Qualifying Facilities other than Goal Line were excluded?

    This list is reproduced directly from the CAISO LTPP database, with adjustments for 2016 as documented in Appendix A.

    c. If the list is not complete, please indicate how the other fossil generation was considered?
    No further resources were modeled.

ORA Response to

SDG&E Data Request Number SDGE-ORA-01
SDG&E SECOND AMENDED GRC Phase 2 APPLICATION – A.15-04-012