Application: A.22-05-XXX
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Witness: Lizzette Garcia-Rodriquez

PREPARED DIRECT TESTIMONY OF

LIZZETTE GARCIA-RODRIGUEZ – CHAPTER 4A

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

MAY 2, 2022

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PREPARED DIRECT TESTIMONY OF
LIZZETTE GARCIA-RODRIGUEZ
CHAPTER 4A

I. INTRODUCTION

The purpose of this testimony is to present the Program Year (PY) 2020 and 2021 ex-post load impacts as well as the 2023 ex-ante load impacts of San Diego Gas & Electric Company's (SDG&E) supply side demand response (DR) programs in support of SDG&E's bridge funding request for 2023. Ex-post load impacts measures after-the-fact program performance for event-based activities and they are reported in the April 1st Annual Load Impact Report filing.[1] Ex-ante load impacts are forecasts of the expected load impacts from future DR programs and are primarily informed by historical DR performance, weather conditions, and customer enrollments. Also, the testimony contains the proposed budget for the Measurement and Evaluation of the DR programs, DR pilots, and SDG&E's Electric Rule 32 for 2023.[2]

II. BACKGROUND

On April 24, 2008, the Commission issued Decision (D.) 08-04-050 (the "Decision") adopting protocols for estimating the impact of DR activities on electric load as well as a forecast of expected load impacts. The Decision requires evaluating the DR programs and dynamic rates every year. In addition, it provides that load impact reports should be filed with the Commission on April 1st of each year. The Decision grouped the 27 protocols into the following categories:[3]

- *Evaluation Planning – Protocols 1 through 3;*
- *Ex-post Evaluation for Event Based DR Resources – Protocols 4 through 10;*
- *Ex-post Evaluation for Non-Event Based DR Resource – Protocols 11 through 16;*
- *Ex-ante Estimation of DR Resource Load Impacts – Protocols 17 through 23;*
- *Impact Estimation of DR Portfolios – Protocol 24;*
- *Sampling Methods – Protocol 25;*
- *Reporting Requirements – Protocol 26; and*

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[1] April 1 Annual Load Impact Reports. Available at http://www.sdge.com/regulatory-filing/10486/oir-enhance-role-dr-meeting-state-resource-planning-ops-reqmt

[2] *See* Prepared Direct Testimony of Lizette Garcia-Rodriguez Chapter 2B for my direct testimony supporting SDG&E's budget request to support the Measurement and Evaluation of the DR programs, DR pilots, and SDG&E's Electric Rule 32 for 2024-2027.

[3] D.08-04-050, p. 8.

- *Process Review – Protocol 27.*

On April 8, 2010, D.10-04-006 modified the Decision, and requires filing of an annual load impact executive summary report along with summary tables that contain aggregated average ex-ante load impacts.

In D.14-03-026, the Commission established that all event-based DR programs must be market integrated. That is, beyond the specified exceptions, event-based load-modifying DR programs are not eligible for capacity determination.

In D.16-04-050, the Commission granted an exemption from the LIPs for all market-integrated third-party DR resources for the 2017-2019 Resource Adequacy (RA) compliance years. This means, third-party Demand Response Providers (DRPs) could use contract capacity instead of LIPs, to set up the RA capacity values.

In D.19-06-0265, the Commission acknowledge the expiration of this exemption and established that LIPs were required to determine the qualified capacity (QC) values for all market-integrated DR resources whether third-party or Utility-managed. The exception to this requirement is for the Demand Response Auction Mechanism (DRAM).

III. EX-POST LOAD IMPACTS 2020 AND 2021

This section addresses the ex-post load impacts of SDG&E's DR programs. The purpose of the ex-post analysis is to develop hourly and daily load impact estimates for every demand response event in the 2020 and 2021 program years. Historical ex-post load impacts inform the ex-ante load impact estimates. For some programs, the events hours change across the year, so the ex-post load impact results for each program were created by calculating the average during the event hours of each event date and then averaging across all the event dates. Table LG-1 below presents a summary of the 2020 ex-post results originated in the 2020 measurement and evaluation reports filed April 1, 2021.

Table LG-1 Ex-Post Load Impact Results (MW) - PY2020

Program name	Estimated Load Impact on a typical event date (MW)	Total enrolled accounts on a typical event date	Number of events	Max Temp (Miramar)
AC Saver Day-Ahead Commercial	0.44	941	20	85
AC Saver Day-Ahead Residential	4.55	15,137	20	83
AC Saver Day-Of Commercial	0.15	3,124	20	83
AC Saver Day-Of Residential	0.94	6,975		85
Base Interruptible Program (BIP)	0.42	4	5	93

CBP Day-Ahead (Including products 11am-7pm)	0.02	4	16	99
CBP Day-Ahead (Including products 1pm-9pm)	0.39	19	25	85
CBP Day-Of (Including products 11am-7pm)	0.15	67	18	88
CBP Day-Of (Including products 1pm-9pm)	2.03	91	22	85

Table LG-2 below includes a summary of the 2021 ex-post results originated in the 2021 measurement and evaluation reports filed April 1, 2022.

Table LG-2 Ex-Post Load Impact Results (MW) - PY2021

Program name	Estimated Load Impact on a typical event date (MW)	Total enrolled accounts on a typical event date	Number of events	Max Temp (Miramar)
AC Saver Day-Ahead Commercial	N/A*	N/A*	0	N/A*
AC Saver Day-Ahead Residential	6.02	14,839	5	87
AC Saver Day-Of Commercial	0.22	2,312	7	83
AC Saver Day-Of Residential	0.44	7,798		84
Base Interruptible Program (BIP)	0.07	1	1	81
CBP Day-Ahead (Including products 11am-7pm)	0.20	22	26	83
CBP Day-Ahead (Including products 1pm-9pm)	0.06	24	11	76
CBP Day-Of (Including products 11am-7pm)	0.06	11	12	82
CBP Day-Of (Including products 1pm-9pm)	0.97	122	20	80

*SDG&E did not trigger the AC Saver Day-Ahead Commercial program in 2021.

IV. SUMMARY OF LOAD IMPACT AND CUSTOMER FORECAST FOR 2023

Tables LG-3 contains a summary of the forecast load impacts and enrollment customer forecast respectively of SDG&E's DR activities for 2023 based on PY21 SDG&E 1-in-2 weather conditions for August monthly peak day filed April 1, 2022.

Table LG-3 Ex-Ante Load Impact Results (MW) and Customer Enrolled Forecast PY2021 for the year of 2023 SDG&E Weather Scenario 1-in-2 Portfolio – August

Program name	2023 Load Impact (MW)*	2023 Customer Enrolled Forecast
AC Saver Day-Ahead Commercial (Thermostats)	0.55	612
AC Saver Day-Ahead Residential (Thermostats)	4.41**	24,329
AC Saver Day-Of Commercial (Switches)	0.23	1,450
AC Saver Day-Of Residential (Switches)	1.52	6,683
Base Interruptible Program (BIP)	0.07	1
CBP Day-Ahead Non-Elect product (1pm-9pm product)	0.00	0
CBP Day-Of Non-Elect product (1pm-9pm product)	0.00	0
CBP Day-Ahead Non-Elect product (11am-7pm product)	0.05	11

CBP Day-Of Non-Elect product (11am-7pm product)	0.02	9
CBP Day-Ahead Elect product (1pm-9pm product)	2.31	96
CBP Day-Of Elect product (1pm-9pm product)	3.57	203

* The 2023 Load Impact (MW) are based on RA window 4pm-9pm, this means (HE17-HE21)

** The AC Saver Day-Ahead Residential ex-ante estimates are lower than ex-post estimates due to ex-post estimates are for a 2 hour, 6-8pm event while the ex-ante results are for a 5 hour, 4-9pm event. Reductions drop in each subsequent hour so the average percent reduction over a 5 hour 4-9pm event is lower than in the 6-8pm.

Tables LG-4 contains a summary of the update load impact and enrollment customer forecast respectively based on the proposed DR programs changes described in SDG&E's request for 2023 bridge funding. The update estimates are based on SDG&E 1-in-2 weather conditions for PY21 August monthly peak and described in detail in section V.

Table LG-4 Update Ex-Ante Load Impact Results (MW) and Customer Enrolled Forecast PY2021 for the year of 2023 SDG&E Weather Scenario 1-in-2 Portfolio – August

Program name	2023 Update Load Impact (MW)*	2023 Update Customer Enrolled Forecast
AC Saver Day-Ahead Commercial (Thermostats)	0.55	612
AC Saver Day-Ahead Residential (Thermostats)	4.41**	24,329
AC Saver Day-Of Commercial (Switches)	0.23	1,450
AC Saver Day-Of Residential (Switches)	1.52	6,683
Base Interruptible Program (BIP)	0.07	1
CBP Day-Ahead Non-Elect product (1pm-9pm product)	0.00	0
CBP Day-Of Non-Elect product (1pm-9pm product)	0.00	0
CBP Day-Ahead Non-Elect product (11am-7pm product)	0.05	11
CBP Day-Of Non-Elect product (11am-7pm product)	0.02	9
CBP Day-Ahead Elect product (1pm-9pm product)	2.31	96
CBP Day-Of Elect product (1pm-9pm product)	3.57	203

* The 2023 Load Impact (MW) are based on RA window 4pm-9pm, this means (HE17-HE21)

** The AC Saver Day-Ahead Residential ex-ante estimates are lower than ex-post estimates due to ex-post estimates are for a 2 hour, 6-8pm event while the ex-ante results are for a 5 hour, 4-9pm event. Reductions drop in each subsequent hour so the average percent reduction over a 5 hour 4-9pm event is lower than in the 6-8pm.

V. EX-ANTE FORECAST DETAILS

A. AC Saver Day-Ahead Program

SDG&E AC Saver Day-Ahead participants receive event dispatch signals via either free thermostats or Bring your Own Thermostat (BYOT) thermostats. The thermostats are used as the enabling device that receive a signal from SDG&E to curtail usage during events. The AC Saver Day-Ahead program is described in detail in the prepared direct testimony of E Bradford Mantz (Chapter 1A).

The AC Saver Day-Ahead update of the ex-ante estimates incorporates the following assumptions used in the load impact forecast for the DR application:

a) Increase a projection of 1,000 residential BYOT customers per year due to Net Energy Metering (NEM) customer are eligible to participate.[4]

b) Incorporate new participant forecast for residential BYOT, *i.e.*, projected to be 5,408 based on average new enrollments from 2017 through 2020.

c) Thermostat market share of smart thermostats assumed to grow by 10% a year in 2023, conservative application of market forecast projecting 18% annual growth[5]. Enrollment growth is ramped to mirror this market share growth.

B. AC Saver Day-Of Option

The AC Day-Of has been available to both residential and non-residential customers with technology capable of curtailing AC use within 20 minutes. This program is described in the prepared direct testimony of E Bradford Mantz (Chapter 1A), submitted with this application. The AC Saver Day-Of update ex-ante estimates incorporates the following assumptions to the load impact forecast for the DR application:

a) Ex-post load impacts from 2018, 2019, and 2021 were used as the foundational data for developing the ex-ante model that estimates the weather response of AC Saver Day-Of load impacts. Ex-post load impacts for 2020 were not included because the COVID-19 pandemic caused the residential and commercial reference loads and impacts to shift considerably compared to other years.

b) SDG&E does not have any plans to market the AC Saver Day-Of program using the one-way switches, therefore the non-residential enrollment forecast shows a decrease on 30% and 50% cycling option of 27.8% and 25.7% respectively and the residential enrollment forecast shows a decrease on 50% and 100% cycling option of 7.7% and 3.7% respectively based on the historical enrollment for the summer of 2020 and 2021.

[4] D.2103056 states SDG&E shall modify the AC Saver tariff to allow participation by residential NEM customers.

[5] https://www.freedoniagroup.com/industry-study/smart-and-connected-thermostats-3659.htm.

C. Base Interruptible Program (BIP)

SDG&E's BIP is a voluntary program that offers participants a monthly capacity bill credit in exchange for committing to reduce their demand to a contracted firm service level on short notice during emergency situations. Over the past 3 years, the BIP program has experienced a decrease of 86% in terms of load reduction. The primary reason for the decrease is that SDG&E unenrolled the few remaining customers because they no longer met the minimum load reduction requirement of 100kW. In 2020, there were 4 accounts enrolled in this program. However, three accounts unenrolled with an effective date of April 1, 2021. The BIP program currently has no accounts enrolled.

Therefore, the BIP ex-ante forecast assumes one single customer in 2023. The proposed program changes are described in the prepared direct testimony of E Bradford Mantz at (Chapter 1A), submitted with this application.

D. Capacity Bidding Program (CBP)

SDG&E proposes to retire the Day-Ahead and Day-Of 11am-7pm non-elect option in 2024. Table LG-5 lists the current CBP products in 2022. The proposed program changes are described in the prepared direct testimony of E Bradford Mantz at (Chapter 1A), submitted with this application.

Table LG-5: 2022 CBP Current Products

Notice	Limit	Hours
CBP Day-Ahead	2-4 hours	11:00 a.m. – 7:00 p.m.
CBP Day-Ahead	2-4 hours	1:00 p.m. – 9:00 p.m.
CBP Day-Of	2-4 hours	11:00 a.m. – 7:00 p.m.
CBP Day-Of	2-4 hours	1:00 p.m. – 9:00 p.m.
CBP Day-Ahead Elect option	2-4 hours	1:00 p.m. – 9:00 p.m.
CBP Day-Of Elect option	2-4 hours	1:00 p.m. – 9:00 p.m.

The CBP update ex-ante estimates incorporates the following assumptions to the load impact forecast for the DR application:

a) SDG&E's enrollment forecast for the Day Ahead and Day Of products assume the customer enrollment will increase by 2% starting in 2023 due to the CBP program improvements proposed by SDG&E.

b) SDG&E performed a survey with aggregators to identify participant interest in switching from the non-elect 11-7 product to the elect 1-9 product.[6] Aggregator 1 and 2 stated that they are willing to move all their customers from non-elect 11-7 product to elect 1-9 product. Aggregator 3 stated that 40% of their customers will switch to from Day-Ahead non-elect 11-7 product to Day-Ahead 1-9 and 20% of their customers will transfer to from Day-Of non-elect 11-7 product to Day-Of elect 1-9 product. Aggregator 4 stated that all nominations are currently for the Day-Of 1-9 product. In addition, one of aggregators mentioned that 113 customers currently enrolled under other DR programs are likely to switch over the CBP Elect products in 2022. These assumptions were incorporated into the enrollment forecast.

VI. 2023 MEASUREMENT AND EVALUATION BUDGET FOR DR PROGRAMS

Measurement and Evaluation (M&E) is an important tool to design a program, establish the eligibility of the resources, measure the performance, forecasting, and planning purposes to achieve the DR goals. The M&E budget has three categories related to programs described below:

a) Load Impact Evaluations for DR Programs: In D.08-04-50, the Commission adopted the load impact protocols requiring that the evaluation of the demand response programs must include ex-post load impacts that are useful to evaluate past event performance. The decision requires producing hourly ex-post load impact results for DR Programs.[7] In addition, the decision also requires producing 10-year forecast load impacts based on 1-in-2 and 1-in-10 weather scenarios.[8] The ex-ante results are necessary for long-term resource planning and for the cost-effectiveness analysis of DR programs.

The hourly ex-ante forecasts have been used as an input to produce SDG&E's internal hourly short-term forecasts that are required to be sent daily to SDG&E's

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[6] In 2021, SDG&E performed a survey to aggregators under the traditional CBP non-elect products to determine aggregators interest in moving from the non-elect 11-7 products to the elect 1-9 products in 2022.

[7] D.08-04-051, p. 10.

[8] *Id*. at pp. 25-26.

electric procurement group, the CAISO, the California Energy Commission and the Energy Division during the summer, and weekly during the winter. Also, when SDG&E trigger a program, the internal short-term forecast is a used as a point of comparison with the preliminary event performance.
Furthermore, this category includes the budget for the demand response forecast application development for the ongoing costs of maintaining the demand response forecasting software. This application is a tool to produce SDG&E's DR daily short-term forecast.

b) Miscellaneous research, analytical support, and labor support: SDG&E is proposing to utilize additional funds for unplanned research needs. For instance, in 2021 Energy Division directed the IOUs to conduct a workshop to discuss differences in CBP retail and wholesale baselines and perform a baseline analysis and produce a report. This CBP baseline analysis was not planned for and the IOUs needed to hire a consultant to carry out the analysis. Also, in 2021 Energy Division directed the IOUs to conduct workshop for the QC methodology. SDG&E believes these types of requests will continue and their costs are included in the budget as miscellaneous research and analytical support. Also, the budget includes the labor costs to perform the DR load impact evaluation and other analytical support.

The 2018-2022 Measurement and Evaluation Budget did not include the budget for Electric Rule R32 measurement and evaluation support and only included the budget for one DR pilot. Section VII and VIII below include the budget in detail for R32 and Residential CBP DR Pilots for 2023.

Table LG-6: 2023 Measurement and Evaluation Budget for DR Programs

SDG&E M&E Activities	2023
Load Impact Evaluations for DR Programs and forecasting software	$432,000
Miscellaneous research, analytical support, and loaded labor support for DR Programs	$540,000
Total M&E related costs for DR Programs	**$972,000**

VII. 2023 MEASUREMENT AND EVALUATION BUDGET FOR DR PILOTS

SDG&E is requesting additional funds to support the Load Impacts Evaluation for DR Pilots and Customer Research described below:

a) Load Impacts Evaluation for DR Pilots: SDG&E is proposing to conduct a load impact evaluation for Residential CBP DR pilot according with the DR protocols described in D.08-04-50. The primary objective is to evaluate the effectiveness of and customer perceptions about the Residential CBP pilot. The M&E plans in support of the prepared direct testimony of E Bradford Mantz at (Chapter 1A) can be found on Appendix A.

b) Loaded labor: The loaded labor costs are included in this budget to support the DR Pilot. Appendix A includes details of the process evaluation/surveys for the DR Pilot.

Table LG-7: 2023 Measurement and Evaluation Budget for DR Pilot

SDG&E M&E Activities	2023
Load Impact Evaluations for DR Pilot	$30,000
Loaded labor support for DR Pilot	$75,150
Total M&E related costs for DR Pilot	**$105,150**

VIII. 2023 COMMISSION DIRECTED BUDGET

Finally, SDG&E believes it is prudent to request funds to cover any additional Commission Directed Research necessary to support Demand Response Potential studies. The Commission has directed SDG&E to conduct additional research on a National Assessment of Demand Response Potential in previous years and we reasonably expect similar requests for these types of studies to continue in 2023.

Table LG-8: 2023 Commission Directed Research Budget

Commission-Directed Research Activities	2023
Commission-Directed Research	$200,000
Total Commission Directed Research	**$200,000**

IX. CONCLUSION

This concludes my prepared direct testimony.

X. QUALIFICATIONS

My name is Lizzette Garcia-Rodriguez. My business address is 8306 Century Park Court, San Diego, California 92123. I am employed by SDG&E as Load Analysis Project Manager III in the Customer Pricing Department. In my current position, I am responsible for managing and conducting load and energy research analysis.

I attended National Autonomous University of Mexico, where I graduated with a Bachelor of Actuarial Science in 1996. I continued to attend University of Phoenix where I graduated with an MBA in 2015. In 2009, I was employed by SDG&E to work in the Load Research Section of the Marketing Department as a Business Economic Analyst II. Over the past 12 years I have held positions of increasing responsibility within the company that have included Load and Energy Research.

I have not previously testified before the Commission.

APPENDIX A

EVALUATION, MEASUREMENT, AND VERIFICATION (EM&V) PLAN FOR RESIDENTIAL CBP PILOT

As described in the prepared direct testimony of E Bradford Mantz (Chapter 1A), SDG&E is requesting to continue the Residential CBP Pilot and conduct a post pilot evaluation in 2023. The Residential CBP is a demand response (DR) program that gives customers the opportunity to earn incentive payments in exchange for reducing electric demand. For the purpose of the EM&V plans, SDG&E assumes customer participation in this pilot, however the methodology described on the EM&V plan could change depending on the number of customers that join the pilot and/or if customers don't desire to participate. The methodology will conform with the DR Load Impact Protocols.

The primary three objectives to be evaluated in the post evaluation are:[9]

Objective 1: What are the ex-post and ex-ante load impacts for each program year?

Recommended Metrics

1. What were the demand reductions due to program operations and interventions in 2021 – for each event day and hour and for the average event?
2. How do load impacts differ for customers who have enabling technology and/or are dually enrolled in other programs?
3. How do weather and event conditions influence the magnitude of demand response?
4. How do load impacts vary for different customer sizes, locations, and customer segments?
5. What is the ex-ante load reduction capability for 1-in-2 and 1-in-10 weather conditions? How well do these reductions align with ex-post results and prior ex-ante forecasts?
6. What concrete steps can be undertaken to improve program performance?

Evaluation Methodology

The evaluation of ex-post and ex-ante impacts will conform to the California Demand Response Load Impact Protocols as SDG&E anticipates this pilot being converted to a

[9] Residential Capacity Bidding Pilot Implementation Plans by Demand Side Analytics August 2021.

program after 2027. The evaluation methodology will rely on regression analysis of participants and a control group. Variables included in the regression analysis may include month, Day-Of week, and hour indicators along with one or more temperature variables.

Objective 2: Can customers meet their targeted load reduction and can that reduction be accurately measured by a CBL?

Recommended Metrics

1. Baseline-calculated load reduction for each participant and event.
2. Participant load impact achievement rate (participant load impacts from Objective 1 divided by their target reduction).
3. Participant baseline achievement rate (baseline-calculated load reduction divided by their target reduction).
4. Average achievement rates by event day, dispatch type, weather conditions or other factors.
5. Percentage of non-achievement rates (achievement rate of 10% or less) by event day, dispatch type, weather conditions or other factors.
6. Accuracy and precision of customer impacts calculated using baseline method on placebo event days and ex-post and ex-ante results.
7. Accuracy and precision of customer incentive payments calculated using baseline method on placebo event days.

Evaluation Methodology

Using participant interval data, event data, and weather data, customer baseline-calculated impacts will be compared to the participant-level load impacts estimated in Objective 1. The achievement rate of customer reductions compared to their target reduction will inform how successful customers can be at producing load reductions when dispatched. This objective will also assess how well the settlement baseline method can accurately quantify the load impacts provided by participants on both a per-kWh and dollar basis. The accuracy and precision of load impacts can be quantified by running a baseline accuracy study, whereby participant interval data is used to simulate placebo events (where no dispatch was given) and calculate the ability of the baseline method to yield the expected 0 impacts.

Objective 3: What design decisions and procedures can improve pilot effectiveness?

Recommended Metrics

1. What are drivers of aggregator recruitment and retention?
2. What are drivers of participant satisfaction with the pilot?

Evaluation Methodology

The evaluation of this objective will rely on a process evaluation. This evaluation will interview program administrators and aggregators to understand current pilot procedures and activities and will recommend improvements. A process evaluation will be conducted, that will survey current participants to understand customer satisfaction with the program, number of events, incentives and aggregator and utility communication.