Application No. 16-03-003
Exhibit No.: (SDG&E-___)

AMENDED PREPARED DIRECT TESTIMONY OF
JOSHUA M. GERBER
ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

APRIL 5, 2016

#304504

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AMENDED PREPARED DIRECT TESTIMONY OF

JOSHUA M. GERBER

ON BEHALF OF SDG&E

I. INTRODUCTION / OVERVIEW

The purpose of my testimony is to describe San Diego Gas & Electric Company's ("SDG&E") overall strategy for procuring energy storage pursuant to California Public Utilities Commission ("CPUC" or "Commission") decision ("D.") 13-10-040[1] ("the Energy Storage Decision").

SDG&E continues to be committed to meeting the storage targets initiated by California Assembly Bill ("AB") 2514[2] and established in the Energy Storage Decision by procuring cost-effective and viable energy storage systems ("ESS") that provide value to customers, utility operations and that benefit society. Cost-effectiveness for ESS will differ based on the different use cases and applications that SDG&E intends to procure during the 2016 solicitation cycle and subsequent cycles. Viability for ESS is an evolving concept that, because of the nascent nature of the technology and the limited history of utility solicitations, must be evaluated on a case-by-case basis. The ultimate decision will rely on qualitative factors as well as quantitative factors.

The specific drivers for the procurement of energy storage systems in the SDG&E service territory will continue to evolve during 2016-2020. However, current drivers include, but are not limited to, reliability, renewable resource integration,

[1] D.13-10-040 – Decision Adopting Energy Storage Procurement Framework and Design Program – was issued on October 21, 2013 and can be found on the CPUC website at: http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M079/K533/79533378.PDF Ordering Paragraph 4.

[2] At California Public Utilities Code ("P.U. Code") §2835-2839 .

greenhouse gas ("GHG") emissions reductions, and replacement of local capacity resources as a result of the shutdown of the San Onofre Nuclear Generating Station ("SONGS") and once-through-cooling ("OTC") power plants. The following sections provide an overview of SDG&E's near-term strategy.

II. OVERALL STRATEGY & 2016-2020 PLAN

SDG&E's 2016 solicitation cycle and any subsequent solicitation cycles will seek to identify projects consistent with the guiding principles established in AB 2514 at P.U. Code §2837. These guiding principles include:

- The optimization of the grid, including peak reduction, contribution to reliability needs, or deferment of transmission and distribution upgrade investments;
- The integration of renewable energy; and
- The reduction of greenhouse gas emissions to 80 percent below 1990 levels by 2050, per Governor Brown's mandate in Executive Order B-30-15.[3]

According to the Energy Storage Decision, SDG&E is instructed to solicit and procure 165 megawatts ("MW") of energy storage capacity by 2020.[4] That capacity must be in-service no later than 2024.[5] In addition, SDG&E is authorized, through the 2012 Long Term Procurement Plan Proceeding's ("LTPP") Track IV Decision,[6] to procure preferred resources and energy storage to meet local capacity requirements ("LCR") with in-service dates no later than year-end 2021.[7] Because of the overlapping energy storage requirements and authorizations among these decisions, SDG&E's primary strategy is to procure energy storage resources that

[3] Executive Order B-30-15 is available at: https://www.gov.ca.gov/news.php?id=18938.
[4] D.13-10-040 at 76, OP 1 adopting the Energy Storage Procurement Framework and Design Program
[5] *Id.*
[6] D.14-03-004 – Decision Authorizing Long-Term Procurement for Local Capacity Requirements Due to Permanent Retirement of the San Onofre Nuclear Generations [sic] Stations (the "Track IV Decision").
[7] *Id.*

simultaneously satisfy SDG&E's storage mandate and meet SDG&E's LCR needs. This approach will both minimize costs to customers and also require that SDG&E move on a somewhat accelerated timeline to ensure resources are approved, constructed and in service in time to meet the California Independent System Operator's ("CAISO") needs and the Commission's deadlines.

SDG&E conducted its initial biennial procurement cycle in 2014, and will complete three additional biennial solicitation cycles (in 2016, 2018 and 2020) to procure capacity for the three domains established in the Energy Storage Decision: transmission, distribution and customer. For the current 2016 solicitation cycle, SDG&E will seek offers in all three domains via its 2016 Preferred Resources Local Capacity Requirement Request for Offers ("RFO"), and for the distribution domain via its 2016 Distribution Reliability Request for Proposals ("RFP"). SDG&E will utilize the value of employing competitive RFO and RFP processes and intends to utilize these processes to procure additional energy storage systems. SDG&E may also pursue other procurement methods as appropriate.

The Energy Storage Decision established the following initial schedule for SDG&E's procurement targets for 2014-2020:[8]

[8] *Id.*

Table JG-1
SDG&E's Procurement Schedule Based on the Energy Storage Decision

Domain	2014	2016	2018	2020	2014-2020
Transmission	10 MW	15 MW	22 MW	33 MW	80 MW
Distribution	7 MW	10 MW	15 MW	23 MW	55 MW
Customer	3 MW	5 MW	8 MW	14 MW	30 MW
Total	20 MW	30 MW	45 MW	70 MW	165 MW

A. Revised SDG&E Table – Accounting for Existing Projects, New Projects procured through the 2014 Procurement Cycle, and Potential Domain Transfers

Based on the projects and programs approved in the Energy Storage Decision (D.13-10-014 at 27-37, Section 4.5 – Adjustments to Targets), and the new projects proposed for inclusion by SDG&E in Section III of this testimony, SDG&E is herein proposing the following revised table:

Table JG-2
SDG&E's 2016-2020 Proposed Procurement Table – All Domains

Procurement Targets and Current Progress	Transmission	Distribution	Customer	Total
Established Target	80.00 MW	55.00 MW	30.00 MW	165.00 MW
Less Existing projects as authorized	40.00 MW	6.15 MW	4.66 MW	- 50.81 MW
Less Expected offsets from 2014/2015 procurement and installations	20.00 MW	0.00 MW	8.29 MW	- 28.29 MW
Net Target for 2016 and remaining cycles / [w/Domain Transfer Out; In]	**20 MW / [4 MW; 59.08 MW][9]**	**48.85 MW / [39.08 MW; 64.85 MW]**	**17.05 MW / [N/A; 47.05 MW**	**85.90 MW**

[9] D.13-10-040 authorized procurement flexibility among the transmission and distribution domains, and allows up to 80% of the target to be shifted between the two domains. *See* D.13-10-040, Appendix A at 3. This was further modified in D.16-01-032 OP1 to allow shifting from the Transmission and/or Distribution domains into the Customer domain up to a "ceiling" of 200% of the customer domain targets.

III. NEW PROJECTS ELIGIBLE TO COUNT TOWARD SDG&E'S PROCUREMENT TARGET

This section provides a brief narrative on both existing projects and new projects SDG&E intends to count towards its procurement targets. Based on previously approved storage projects, new storage additions since the 2014 procurement plan, currently pending contract(s), and currently pending customer-side interconnections, SDG&E has achieved 79.1 MW of energy storage, or 48% of its identified target. Note that approximately 92% of all installed and pending storage capacity is third-party owned, with approximately 8% owned by SDG&E.

A. Existing Projects

As set forth in Table JG-3 below, the Commission authorized SDG&E in 2014 to count 50.81 MW of then existing or in-progress storage projects towards SDG&E's 165 MW target.[10] This authorization included: 1) SDG&E's Lake Hodges Pumped Hydro project, 2) energy storage deployed in SDG&E's Borrego Spring Microgrid project, and 3) energy storage systems deployed as part of SDG&E's 2012 General Rate Case ("GRC"). The remaining quantity comes from existing customer side programs such as Self-Generation Incentive Program ("SGIP") and Permanent Load Shifting ("PLS") program which are approved for procurement eligibility in the Energy Storage Decision.[11]

The following table provides an overview of SDG&E's existing projects:

[10] D.14-10-045 at Attachment A.
[11] *Id.*

Table JG-3
SDG&E's Existing Energy Storage Projects

Domain	Projects	Capacity
Transmission	1. Lake Hodges Pumped Hydro	40.00 MW
	Total Transmission Domain	**40.00 MW**
Distribution	1. Borrego Springs Microgrid Project	0.57 MW
	2. SDG&E's 2012 GRC Energy Storage Program	5.58 MW
	Total Distribution Domain	**6.15 MW**
Customer	1. Self-Generation Incentive Program	3.66 MW
	2. Permanent Load Shifting	1.00 MW
	Total Customer Domain	**4.66 MW**
	Total Capacity Authorized in the 2014 Cycle	**50.81 MW**

B. New Projects/Programs from the 2014 Procurement Cycle

The following describes new projects or programs SDG&E intends to count towards its remaining storage procurement target.

1. Transmission Domain

As described above, the Commission previously authorized SDG&E to count 40 MW of transmission level energy storage capacity from the Olivenhain-Hodges Pumped Hydroelectric project.[12] In addition, as a result of its 2014 All Source RFO, SDG&E has executed a contract for an additional 20 MW transmission level energy storage project. This contract has been

[12] D.14-10-045 at 20

submitted to the Commission for approval.[13] SDG&E anticipates approval of this contract, which will count towards SDG&E's energy storage targets.

2. Distribution Domain

As described above, the Commission previously authorized SDG&E to count 6.15 MW of distribution level energy storage capacity from installed and in-progress projects, including the Borrego Springs Microgrid Project and SDG&E's 2012 GRC Energy Storage Program. While SDG&E did solicit offers for an additional 4 MW of distribution level ESS in its 2014 Distribution Reliability RFP, no offers were selected as a result of that solicitation;[14] therefore, no additional reduction in the distribution domain targets are reflected from the 2014 procurement cycle.

3. Customer Domain

As described above, the Commission previously authorized SDG&E to count 4.66 MW of customer-level energy storage capacity from then installed and proposed SGIP and PLS projects. While these customer-side programs continue to drive growth in the behind-the-meter storage sector, not all ESS being installed by SDG&E's customers is incentivized by the SGIP. Between 2014 and 2016, SDG&E saw an additional 3.00 MW of both SGIP funded and non-SGIP funded ESS installed. In addition, another 5.29 MW of customer-sited ESS is currently progressing through SDG&E's customer generation interconnection queue. These projects meet

[13] On November 2, 2015, SDG&E requested a 120-day extension to file energy storage contracts from the 2014 All Source RFO. CPUC Executive Director Timothy J. Sullivan granted SDG&E's request on November 25, 2015. SDG&E filed Application 16-03-003 requesting approval of its 2014 All Source RFO contracts on March 30, 2016. For more information on this Application see: http://www.sdge.com/regulatory-filing/17416/sdge%E2%80%99s-track-iv-all-source-rfo-application

[14] A post solicitation report was submitted to the Commission and energy storage service list by SDG&E on December 1, 2015.

the eligibility criteria, and SDG&E's updated Customer domain figures (below) assumes these projects count towards the Customer domain targets.

Table JG-4 provides an overview of new projects procured in the 2014 cycle.

Table JG-4
New Projects by Domain

Domain	New Projects from 2014 Cycle	New Capacity
Transmission	Pending Contract from 2014 All Source RFO[15]	20.00 MW
Distribution	No contracts awarded from 2014 Distribution Reliability & Power Quality RFP	0.00 MW
Customer	New interconnections since 2014	3.00 MW
	Currently pending interconnections	5.29 MW
	Total New Incremental Capacity from 2014 Energy Storage Procurement Cycle	**28.29 MW**

IV. PROPOSED 2016 PROCUREMENT PLAN OVERVIEW

SDG&E continues to actively engage parties in the energy storage market to better understand the technical opportunities as well as the limitations, the various business models that are emerging within the industry, and the activities which may better support energy storage. SDG&E's energy storage procurement strategy is designed to allow SDG&E to meet its energy storage procurement targets established in the Energy Storage Decision while minimizing ratepayer costs, maximizing portfolio value and managing risk. Specifically, SDG&E intends to

[15] These contracts have not been executed as of March 1, 2016.

avoid duplicative procurement of resources by aligning requirements and authorizations defined in the Track IV Decision with energy storage-specific procurement targets. Through this strategy, SDG&E will help achieve the market transformation envisioned in the Energy Storage Decision while minimizing ratepayer costs and risks.

Based on existing and proposed projects described in Section III, SDG&E is in compliance with the 2016 procurement target for the transmission and customer domains and in compliance for the distribution domain if it elects to transfer between domains and/or requests deferment. While SDG&E is in compliance with its various Commission-established 2016 procurement targets in each domain, SDG&E believes there are near-term opportunities to address local capacity and preferred resource requirements with storage – and SDG&E is moving on an accelerated timeline to address those requirements. Similarly, there are opportunities to address evolving needs on the distribution system with storage technologies. Accordingly, for the 2016 storage procurement cycles and as described in detail in direct testimony of Patrick Charles, SDG&E will pursue storage in the following solicitations.

1. 2016 Preferred Resources LCR RFO Seeking Local and Flexible Capacity – All Domains

SDG&E issued its 2016 Preferred Resources LCR RFO on February 26, 2016. Through that RFO, SDG&E is soliciting offers for up to 140 MW of energy storage across all three identified domains: transmission, distribution, and customer. Energy storage projects participating in this RFO will compete with other preferred resource product types (energy efficiency, demand response, renewables, and distributed generation) to provide local and flexible capacity in San Diego. This solicitation is seeking both third party and utility-owned and operated energy storage capacity. As with the other product types in this RFO, SDG&E will require that the ESS meet the standards for Resource Adequacy ("RA")

credit consistent with SDG&E's regulatory filings related to RA. Specifically, for the 2016 procurement cycle, SDG&E is seeking energy storage that will qualify as counting towards SDG&E's local capacity requirements ("Local") in the San Diego Local Capacity Requirement area.

As described in Mr. Charles's testimony, storage resources procured via the 2016 LCR RFO must meet all of the criteria included in the Track IV Decision including: 1) complying with RA counting rules, 2) interconnection within the San Diego local subarea (as defined by the CAISO), and 3) have a portion of the delivery term of the agreement encompass all of calendar year 2022. This last requirement – that resources be on-line and operational Q3 2021 to meet RA counting rules for 2022 – dictated that SDG&E issue the 2016 Preferred Resources LCR RFO ahead of the December 1 solicitations envisioned in the Energy Storage Decision.

SDG&E issued the RFO on February 26, 2016, and envisions filing applications to approve contracts from the RFO in early spring 2017. Assuming a 9 month to 1 year approval process, approved projects would not likely even begin the local permitting, construction, system interconnection, and CAISO integration processes until early to mid-2018, and would have potentially 3 years (or less) to accomplish all construction and market integration tests necessary to achieve commercial operation.

In short, to give market-facing storage projects a realistic opportunity to meet the required Q3 2021 on-line date, SDG&E deemed it necessary to issue this storage solicitation ahead of the December 1, 2016 date anticipated in the Energy Storage Decision. Though issued on an accelerated timeline, SDG&E nevertheless expects that any storage procured through this solicitation would count towards SDG&E's remaining storage procurement requirements.

2. 2016 Distribution Reliability/Power Quality Solicitation

During 2016, SDG&E intends to solicit up to 4 MW of utility-owned energy storage systems via a competitive Request for Proposal process to potentially: 1) enable some measure of distribution capacity deferral, and 2) address reliability and/or provide outage management support. In both use cases, SDG&E will look to procure energy storage systems to potentially defer or displace investment in conventional distribution system infrastructure, by identifying a specific distribution system need or use case, and will then compare utility-owned energy storage systems versus other traditional or alternative solutions.

The direct testimony of Randy Nicholson describes the evaluation protocol for each of the aforementioned areas of the 2016 solicitation cycle. The direct testimony of Cynthia Fang describes the proposed cost-recovery mechanisms for the 2016 solicitation cycle.

The quantities in Table JG-5 represent the amounts SDG&E may procure via the two solicitations described above. SDG&E may procure more or less based on the offers received.

Table JG-5
SDG&E's 2016 Solicitation Cycle

Solicitation Name	Domain	Application	Capacity
2016 Preferred Resources LCR RFO	Transmission Distribution Customer	Local and Flexible Capacity Requirements	<= 140.00 MW
2016 Distribution Reliability/Power Quality RFP	Distribution	Distribution Reliability (one or more use cases)	<= 4.00 MW
Total 2016 Solicitation Cycle			<= 144.00 MW

V. CONCLUSION

SDG&E is committed to complying with the procurement targets established in the Energy Storage Decision and the policy direction of AB 2514 to achieve market transformation. SDG&E intends to meet the requirements of the Energy Storage Decision and to procure 165 MW of energy storage systems by 2020. By working in conjunction with customers, legislators, regulators, vendors, utilities and other stakeholders, SDG&E continues to achieve a successful energy storage plan while maintaining/improving safety, reliability, resiliency, and efficiency of the electric delivery system.

Therefore, SDG&E respectfully requests that the Commission approve its 2016 Energy Storage Procurement Plan Application as described in this testimony. This concludes my prepared direct testimony.

VI. STATEMENT OF QUALIFICATIONS

My name is Joshua M. Gerber. My business address is 8306 Century Park Court, San Diego, California 92123. I am employed by SDG&E as Manager of Advanced Technology Integration. My present responsibilities are to ensure a coordinated strategy, direction and policy across all advanced technology domains, specifically, Transmission, Distribution, Customer Services and Information Technology.

I have been employed by Sempra and/or SDG&E since 2003 and have held various senior staff and management positions in IT Infrastructure Engineering and Operations, Architecture, Program Delivery, and Smart Grid.

I received a Bachelor of Science Degree in Business Management from Western Governors University.

I have not previously testified before this Commission.