Exhibit No.___

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application of San Diego Gas & Electric Company (U 902-E) for Approval of the Results from Its 2016 Track IV Local Capacity Requirement Preferred Resources Request for Offers.	Application No. A.17-04-___ (Filed April 19, 2017)

PREPARED DIRECT TESTIMONY

OF JOSHUA GERBER

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

*****PUBLIC REDACTED VERSION*****

April 19, 2017

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ATTACHMENTS

Attachment A – ADDENDUM to Preferred Resources LCR RFO: Energy Storage Product Type RFO Document

Attachment B – BOT Agreement (THIS DOCUMENT IS CONFIDENTIAL IN ITS ENTIRETY)

Attachment C – EPC Agreement (THIS DOCUMENT IS CONFIDENTIAL IN ITS ENTIRETY)

PREPARED DIRECT TESTIMONY OF JOSHUA GERBER

I. OVERVIEW AND PURPOSE

This application seeks, among other things, Commission approval of two (2) utility owned energy storage resources selected in the 2016 Preferred Resources Local Capacity Requirements Request for Offers ("the Preferred Resources LCR RFO"). My testimony generally describes the pre-evaluation process that screened all utility owned storage offers, and provides project details and cost information for the two utility owned storage projects selected in the Preferred Resources LCR RFO. Specifically, my testimony discusses:

1. The Preferred Resources LCR RFO, the code of conduct, and bifurcation of responsibilities between SDG&E's Cost Development and Bid Evaluation Teams;
2. The pre-evaluation process to screen all utility owned energy storage offers for counterparty risk and project viability; and
3. The two (2) utility owned storage projects selected in the Preferred Resources LCR RFO, including contract structures, project descriptions, long-term maintenance capacity augmentation services, safety considerations, and costs/benefits.

My testimony shows how these two utility owned projects are a good value for ratepayers, supported by state policy, Commission precedent, and are in the public interest.

II. UTILITY OWNED ENERGY STORAGE PROJECTS IN THE PREFERRED RESOURCES LCR RFO

A. Background on the Preferred Resources LCR RFO

In pursuing the energy storage procurement targets initiated by Assembly Bill ("AB") 2514[1] and established in Decision ("D.") 13-10-040 (the "Energy Storage Decision"),[2] the Commission instructed utilities, including SDG&E, to:

> … consider all forms of resource ownership (utility-owned, third-party owned, customer-owned, joint ownership), including entering into contracts with customer-sited storage resources directly or via aggregation by third-parties.[3]

Consistent with this direction, the Preferred Resources LCR RFO targeted up to 140 MW across five different resource types: energy efficiency, demand response, energy storage, renewable power and distributed generation.[4] Within energy storage, SDG&E sought offers for both third-party and utility owned resources.

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[1] 2010 Cal. Stat. ch 469, amended by AB 2227 (2012 Cal. Stat. ch 606).

[2] *Decision Adopting Energy Storage Procurement Framework and Design Program* (Oct. 17, 2013), p. 2.

[3] This is reinforced by *id*., finding of fact 21, p. 73: "The definition of energy storage system embraces a mix of ownership models." The Energy Storage Decision's direction for utilities to consider utility-owned energy storage projects is consistent with Cal. Pub. Util. Code ("P.U. Code") § 2835(a)(2)(B), which permits a variety of ownership models (emphasis added):

> (2) An "energy storage system" may have any of the following characteristics: ….
>
> (B) Be either *owned by a load-serving entity* or local publicly owned electric utility, a customer of a load-serving entity or local publicly owned electric utility, or a third party, or is jointly owned by two or more of the above.

[4] Testimony of Patrick K. Charles, PKC-3 – 4 and n. 12. California's Energy Action Plan II issued September 21, 2005, describes the loading order, or priority sequencing, of energy resources to meet increasing energy needs. These preferred resources are: energy efficiency, demand response, renewable resources, distributed generation and combined heat and power. To the extent these resources are unable to satisfy the need, clean and efficient fossil-fired generation is listed as the final option. *See*, http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF, p. 2.

Citations to witness testimony herein are to the prepared direct testimony supporting this application and served concurrently therewith.

For third-party owned storage systems, SDG&E sought offers for Energy Storage Systems – Power Purchase Tolling Agreements ("ESSPPTA").[5] This structure mimics a traditional tolling arrangement whereby the developer is paid a monthly capacity payment for the term of the contract, and SDG&E procures the project's charging electricity and arbitrages the project's energy value. For utility owned storage, SDG&E sought offers under two different contracting models: the Energy Storage System Build, Own, Transfer ("ESSBOT") offers and the Energy Storage System Engineering, Procurement and Construction ("ESSEPC") offers. Under the ESSBOT approach, the project is constructed on developer-owned land, and all permitting, project development, interconnection and construction activities are the developer's responsibility. Upon successful commissioning, SDG&E will take ownership of project and the underlying land. Under the ESSEPC approach, the project is constructed on SDG&E-owned land, the construction activities are the contractor's responsibility, and the parties share the project's permitting and interconnection responsibilities.

B. The Code of Conduct Governing this Solicitation and the Cost Development Team's Responsibilities.

As described in the testimony of Patrick K. Charles, D.07-12-052[6] requires that an IOU, in conjunction with its IE, PRG, and staff of the Commission's Energy Division, develop a strict code of conduct as a precondition for conducting an RFO seeking utility ownership options. The code prevents sharing of sensitive non-public information between utility personnel involved in developing cost estimates for utility ownership bids (the "Cost Development Team"), and utility personnel who create the bid evaluation criteria and select winning bids (the "Bid Evaluation

[5] Selected ESSPPTA offers are described in the testimony of Patrick K. Charles, PKC-40 – 46.

[6] Testimony of Patrick K. Charles, PKC-15 – 17 and 22-24.

Team"). SDG&E gathered signed code of conduct forms from all team members (as well as those that advised those teams, managed them, and who provided oversight), and each strictly adhered to the code of conduct communication and activities provisions throughout the course of the Preferred Resources LCR RFO.

The key functions of the SDG&E Cost Development Team were to:

- Identify qualified sites for ESSEPC projects;
- Develop all technical and business specifications for ESSEPC and ESSBOT projects;
- Coordinate internal SDG&E engineering teams to develop internal costs associated with ESSEPC and ESSBOT projects;
- Develop pre-evaluation criteria for ESSEPC and ESSBOT submissions;
- Pre-evaluate ESSEPC and ESSBOT offers;
- Develop total project costs and SDG&E revenue requirements for qualified ESSBOT and ESSEPC projects for submission to the Bid Evaluation Team prior to the LCR RFO offer deadline.

C. The Pre-Evaluation Process for Utility Owned Offers

As detailed below, in addition to adhering to the code of conduct in developing cost estimates, the Cost Development Team also administered a pre-evaluation process for all utility owned offers. Given the different payment schemes and risk profiles for third-party and utility owned resources, the pre-evaluation process was designed to assess developer experience, counterparty risk and project viability *before* those projects were evaluated by the Bid Evaluation Team. Because the ESSEPC and ESSBOT resources are paid for and owned by SDG&E at the completion of construction (rather than compensated on a monthly basis for the contracted term, as is the case with ESSPPTA resources), SDG&E ratepayers and shareholders assume some risk of project cost overruns, system underperformance and/or failure. Accordingly, SDG&E sought experienced developers with a proven history of constructing grid-scale energy storage projects.

In addition, through the pre-evaluation, SDG&E sought to ensure that the projects were technologically viable, meaning, the projects incorporated best-in-class equipment for major project components like battery cells and inverters. To minimize overall ratepayer risk, the Cost Development Team did not submit projects or offers that fell below the minimum developer experience or project viability thresholds to the Bid Evaluation Team, regardless of their pricing.

To accomplish these risk mitigation and screening objectives prior to the Preferred Resources LCR RFO offer submittal deadline, the Cost Development Team's pre-evaluation process included:

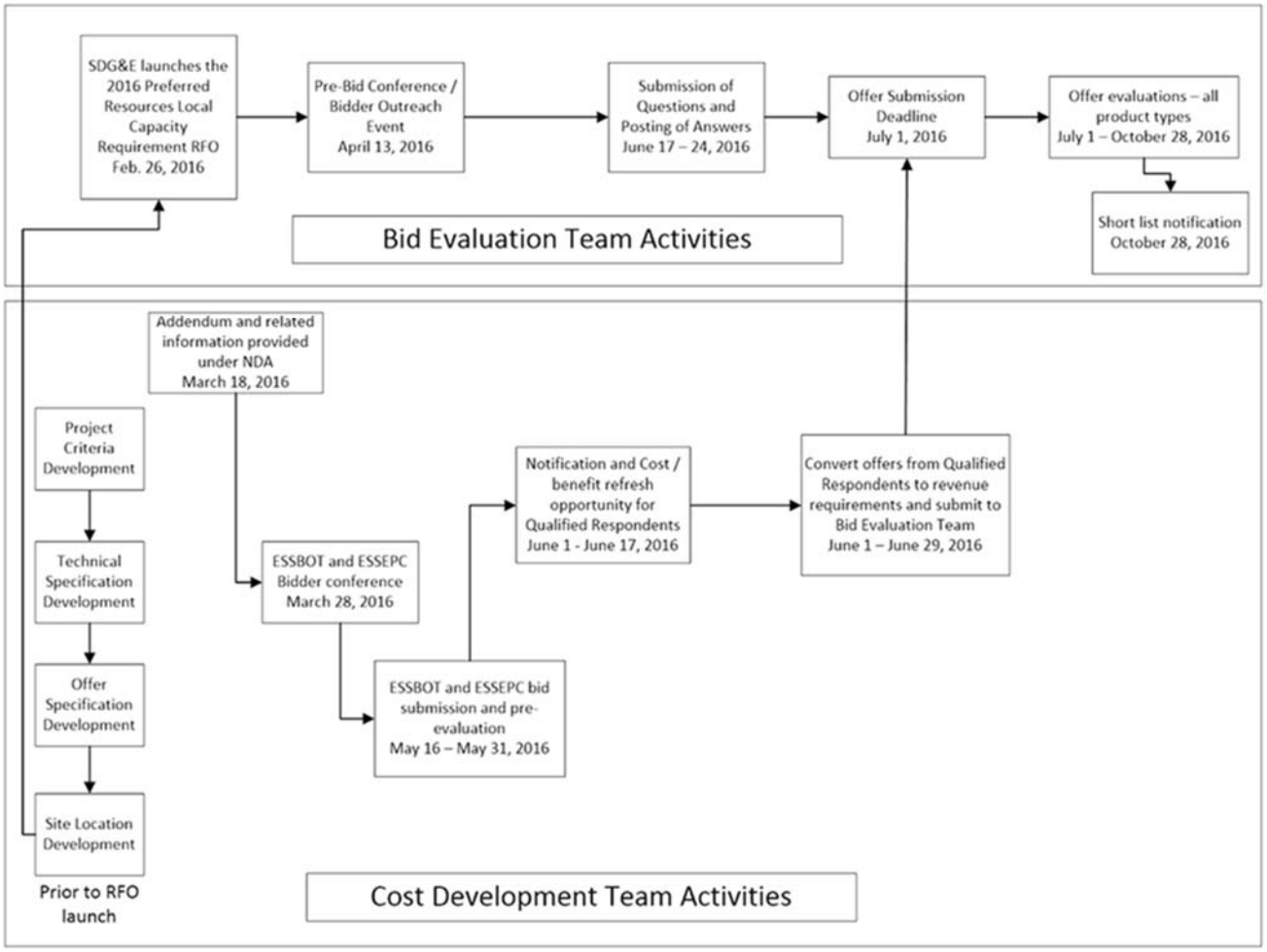
1. An Addendum to the Preferred Resources LCR RFO[7] documentation, outlining detailed developer experience and commercial viability criteria for all utility owned projects;
2. A supplemental offer form soliciting detailed information about the offeror's relevant experience, as well as the proposed project's technical, performance and safety features; and
3. A revised schedule requiring bidders to submit complete offers six (6) weeks before Preferred Resources LCR RFO closing date, and affording bidders passing the pre-evaluation an opportunity to refresh pricing downward prior to final submission of offers to the Bid Evaluation Team.

Consistent with the Preferred Resources LCR RFO process as described in Mr. Charles' testimony, the Independent Evaluator ("IE") oversaw all aspects of the Cost Development Team's pre-evaluation process. For context, Figure 1, below, overlays the Cost Development

[7] The RFO Addendum, without the associated Schedules, is Attachment A to my testimony.

Team's responsibilities and pre-evaluation timeline with the Bid Evaluation Team's responsibilities and the timeline of the Preferred Resources LCR RFO itself.

Figure 1. Cost Development and Bid Evaluation Team Activities and Timeline



III. PRE-EVALUATION PROCESS FOR UTILITY OWNED ENERGY STORAGE PROJECTS

A. Initial Expression of Interest, Eligibility Requirements and Pre-Evaluation Process Schedule.

1. Schedule for expressions of interest

The February 26, 2016 Preferred Resources LCR RFO document for energy storage resources directed all ESSBOT and ESSEPC bidders to provide the Cost Development Team with a formal, written expression of interest, via email, before March 11, 2016. Each

Respondent who formally expressed interest by the deadline was provided with a non-disclosure agreement ("NDA"), and a requirement that it be executed by March 18, 2016. Those Respondents with executed NDAs were then sent an "Addendum" to the RFO that more precisely described the requirements for ESSBOT and ESSEPC offers, including a detailed pre-evaluation schedule, pre-evaluation process description, and process for submitting final offers on or before the July 1, 2016 RFO closing date. The Addendum contained SDG&E's Energy Storage Technical Specification (conveying the construction standards and technical specifications for all utility owned storage projects),[8] a supplemental offer form, and for EPC respondents, a pro forma EPC contract and, site descriptions of utility owned land available for ESSEPC offers.[9]

After receiving the Addendum, Respondents then had access to a pre-bid conference with SDG&E on March 28, 2016, where the Addendum materials were reviewed online in a webinar and in-person at an SDG&E facility. Respondents also had the opportunity to submit written questions through the Power Advocate system (online bid management software) through April

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[8] The technical specification used for ESSBOT and ESSEPC projects in the Preferred Resources LCR RFO has been under continuous evolution since 2012. SDG&E first developed this specification to support internal, reliability-driven storage projects such as the Borrego Springs Microgrid. The SDG&E technical specification covers all aspects of the battery including construction standards, electrical system standards, protection standards, environmental requirements, safety standards and requirements for integration with SDG&E protection and control systems. For the Preferred Resources LCR RFO, SDG&E updated its specification based on lessons learned from previous projects as well as the input received from our owner's engineer who applied broader lessons learned from across the industry.

[9] The Cost Development Team identified these sites working with distribution planning, substation, and environmental teams at SDG&E. Key considerations were to identify those sites that had sufficient space to accommodate the storage systems, favorable environmental characteristics, the capability to provide low-cost interconnections and deliverability with respect to either CAISO and/or SDG&E's electric distribution system. The result of this process was the selection of sites adjacent to SDG&E's Kearny Mesa and Miramar substations. The distribution planning and substation teams developed interconnection cost estimates for each ESSEPC site offered in the RFO, and these costs were included in the total projects costs evaluated by the Bid Evaluation Team.

18, 2016. SDG&E posted written answers to all questions received by April 18 on or prior to April 25, 2016. ESSBOT and ESSEPC bid packages were then due for submission to the Cost Development Team for pre-evaluation by May 16, 2016. Offers highly ranked in the pre-evaluation process would then have their costs converted into revenue requirements, which in turn would be submitted to the Bid Evaluation Team with all other information required for conformance in the RFO on July 1, 2016.

2. Schedule for Addendum for ESSEPC and ESSBOT offers

The following schedule and deadlines applied to the RFO Addendum (Attachment A, p. 13) for ESSEPC and ESSBOT offers:

No.	Item/EPC & BOT Deliverable	Date
1	RFO Issued. ESSBOT and ESSEPC Respondents provide written expression of interest any time after February 26.	February 26, 2016
2	Deadline for Respondents to provide written expression of interest.	March 11, 2016
3	Deadline to receive executed NDA.	March 18, 2016
4	SDG&E issues RFO Addendum to ESSEPC and ESSBOT Respondents. Respondents Receive: • Addendum document describing process, pre-evaluation criteria and schedule • ESSEPC/ESSBOT Supplemental Offer Form • Schedule A: Energy Storage Technical Specification ESSEPC Respondents also receive: • Schedule B: Energy Storage EPC pro forma • Schedule B1: Pro Forma Exhibits • Schedule C: ESSEPC site descriptions, including project footprints, setback, height limitations, interconnection points, etc.	March 18, 2016
5	ESSEPC and ESSBOT Respondent conference(s)	March 28, 2016
6	Deadline to submit written questions	April 18, 2016
7	Deadline to post answers to Questions in Power Advocate®	April 25, 2016
8	ESSBOT and ESSEPC bid packages due	May 16, 2016
9	Cost Development Team begins pre-evaluation and ranking process	May 17, 2016
10	Cost Development Team notifies highly ranked Respondents	May 31 – June 17, 2016

11	Highly ranked Respondents have opportunity to "refresh" prices/benefits prior to revenue requirement calculation.	Five business days from date of notification
12	Cost Development Team converts highly ranked BOT and EPC offers to revenue requirements	June 1 – June 29, 2016
13	CLOSING DATE: Cost Development Team submits adjusted bids to SDG&E Bid Evaluation Team. Highly ranked ESSEPC and ESSBOT offers from pre-evaluation process and supporting documentation uploaded to the 2016 Preferred Resources LCR RFO Website.	July 1, 2016

3. Minimum eligibility criteria for ESSEPC and ESSBOT offers

On March 18, 2016, all ESSEPC and ESSBOT bidders who expressed formal interest in the RFO and executed an NDA received an Addendum to the RFO that specifically outlined the minimum commercial viability and equipment eligibility criteria. These criteria would provide SDG&E with basic information about the offered energy storage solution[s] and Respondents' experience installing and operating grid-scale systems. During the pre-evaluation period, the Cost Development Team assessed all proposals for conformance with minimum eligibility criteria, outlined in the Addendum, Sections 3 and 4.[10] ESSBOT and ESSEPC offers must have met the minimum eligibility criteria to be considered.

4. Participation criteria for all ESSEPC and ESSBOT offers

In addition to meeting the minimum eligibility requirements described above, the Cost Development Team required that all ESSBOT and ESSEPC offers meet specific participating criteria. In particular, these criteria set requirements for:

- Delivery dates;
- Disclosure of affiliate relationships;
- O&M pricing;
- Capacity guarantees;

[10] Attachment A, pp. 5-11

- Availability and efficiency guarantees;
- Residual capacity;
- Acceptable project size/capacity range;
- Interconnections; and
- Permitting plans.

The details of the specific participating criteria are in the RFO Addendum, section 3.0(B).[11]

The criteria for residual capacity required bidders to guarantee the rated capacity of the energy storage system ("ESS") for each offer's stated term, and allowed bidders to recover costs associated with the capacity guarantee through a Long Term Services Agreement ("LTSA") or similar mechanism throughout the stated term. Because of the ongoing maintenance required to preserve and uphold the required capacity guarantee, the ESS would therefore have 100% of its initial rated capacity at the end of the offer's guarantee term. The resource could therefore be operated for some additional time beyond the guarantee period, providing residual capacity and energy benefits without incurring additional capacity and capacity guarantee costs.[12] The specific participating criteria are detailed in Section 3.0(B) of the RFO Addendum.[13]

In addition, section 3.0(C) of the RFO Addendum[14] also specified the following additional criteria for ESSEPC Respondents:

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[11] Attachment A, pp. 5-8

[12] While SDG&E does not anticipate additional capacity and capacity guarantee costs beyond the guarantee period, the Cost Development Team included a cost assumption for ongoing internal project maintenance during the post-guarantee period in offers it forwarded to the Bid Evaluation Team. These costs offset the project's residual benefits

[13] Attachment A, pp. 5-6.

[14] Attachment A, pp. 7-8.

1. The energy storage equipment must fit within the designated site-specific footprints provided in Schedule C.

2. ESSEPC projects must observe all zoning setbacks from property line, building height limitations, and noise limitations provided in Schedule C.

3. ESSEPC Respondents may modify the ESSEPC Pro Forma and submit such modifications in their offer package provided such modifications add value to the offer. However, SDG&E discouraged extensive modifications and will consider materiality of such changes on a qualitative basis as it evaluates the offers received.

4. The energy storage equipment must meet the technical requirements outlined in ESS Technical Specification provided to ESSEPC Respondents. ESSEPC Respondents may modify the ESSEPC ESS Technical Specification and submit such modifications in their offer package provided such modifications add value to the offer. However, SDG&E discouraged extensive modifications and will consider materiality of such changes on a qualitative basis as it evaluates the offers received.

5. SDG&E reserves the right at its sole discretion to terminate or eliminate a proposed project site identified in Schedule C prior to contract execution without the obligation to pay for costs incurred by the Respondent.

B. Pre-Evaluation and Ranking Process and Results

On May 17, 2016, with the IE's oversight, the Cost Development Team collected bid packages and began assessments of each offer. The Cost Development Team reiterated to each Respondent that high scoring and ranking offers identified in the pre-evaluation process would be submitted by SDG&E's Cost Development Team to SDG&E's Bid Evaluation Team by the Closing Date. There, the Bid Evaluation Team would evaluate these offers against all other product types solicited in the 2016 Preferred Resources LCR RFO to determine overall cost-effectiveness. The Cost Development Team also reiterated that the intent of the pre-evaluation process was not to simply shorten the list of Respondents to some pre-determined number. Rather, the goal was to identify low-risk counterparties and projects. If all Respondents and proposed projects were to score and rank highly in the pre-evaluation, then all offers from those Respondents would be forwarded to the Bid Evaluation Team on the Closing Date.

The pre-evaluation offer review process focused primarily on the following areas (these criteria were normalized to remove any bias related to the differences in technology):

- Technical Merit of the Proposed System, including:
  - Proposed equipment
  - Project design/Layout
  - Performance/Operation
  - Environmental/Health/Safety
  - Exceptions to the Technical Specification

- Respondent's Experience/Financial Viability/Risk
  - Respondent's prior project experience with energy storage systems (particularly of systems of the same MW/MWh size as those being offered, and/or capabilities sought in the RFO)
  - Respondent's prior experience providing post commercial operation support and services
  - Respondent's overall financial health and stability
  - Exceptions to the pro forma EPC contract and Exhibits (ESSEPC Bidders Only)

- Overall System Cost
  - Capital Expenditures
  - Fixed and Variable Operations and Maintenance costs (O&M)

In all, the Cost Development Team received ESSEPC and/or ESSBOT offers from eleven (11) developers: eight (8) different companies for ESSEPC projects, and three (3) different companies for ESSBOT projects. Through the pre-evaluation process, the Cost Development Team eliminated two (2) Respondents for failure to meet the minimum eligibility requirements outlined above; and two (2) Respondents were screened out as having unfavorable project viability, project experience, and/or cost scores. The remaining six (6) Respondents with high scores and rankings ("Qualified Respondents") then moved on to the opportunity to refresh some components of their offers.

C. Bid Refresh Opportunity for Respondents Meeting the Minimum Eligibility and Pre-Evaluation Screens

On May 31, 2016, the Cost Development Team began notifying Qualified Respondents of the pre-evaluation process results, and provided each with a limited opportunity to refresh

some components of their base offer(s), to be completed within five (5) days of that notification. This refresh opportunity was designed to generate the highest value/lowest cost offers prior to final submission to the Bid Evaluation Team for evaluation against other storage offers, and offers from other preferred resources. The price/value refresh opportunity for Qualified Respondents was entirely optional, and offers passing the initial pre-evaluation screens were to be forwarded to the Bid Evaluation Team even if a Qualified Respondent elected not to refresh any of the base offer components.

Within five (5) days after notification, all Qualified Respondents had the opportunity to refresh identified aspects of their offers, subject to the following conditions communicated to Respondents in the RFO Addendum.

- Overall Price: Respondents may make a *downward* adjustment in any offer's overall price. Respondents may not increase any offer's overall price.
- Variable and fixed O&M Cost Estimates ($/MWh and $/year): Respondents may adjust any offer's variable and fixed O&M cost estimates, but may not increase the project's overall price.
- Variable Cycle Offer Price for Optional Flex ($/MWh): Respondents may adjust any offer's Variable Cycle Offer Price for Optional Flex estimate, but may not increase the project's overall price.
- Residual Capacity value: Respondents may *increase* any offer's Residual Capacity, but may not increase the project's overall price. Respondents may not decrease any offer's warranted Residual Capacity Benefit.
- Cycling Restrictions: Respondents may *increase* any offer's maximum annual deep cycling limits, but may not increase the project's overall price. Respondents may not decrease any offer's stated maximum annual deep cycle limits.

All six (6) Qualified Respondents took advantage of the refresh opportunity to submit revised bids that lowered overall project costs and/or increased overall project benefits.

D. Developing the Bid Costs and Delivery of Eligible Offers to the Bid Evaluation Team

After receiving final, refreshed offers from Qualified Respondents, the Cost Development Team updated ESSEPC offers to include SDG&E's internal interconnection costs for those projects. These estimates incorporate the infrastructure from the high-side of the project's step up transformer and either the transmission or distribution grid. Interconnection costs includes any necessary substation upgrades as well as all cabling and related trenching, protective relaying and switching.

After adding interconnection costs to ESSEPC offers, all ESSEPC and ESSBOT offers from Qualified Respondents were processed through SDG&E's revenue requirement model to determine the total project costs that would be recovered from customers for each proposed project over its life. The revenue requirements were used as the project costs for all ESSEPC and ESSBOT offers, as they are comprised of all costs recovered from customers, including direct project costs, operations and maintenance costs, and all other expenses required to support the investment, such as authorized return on investment, income and property taxes. The revenue requirements are represented as annual and/or monthly cash flows for at least the life of the asset, and are therefore comparable to annual and/or monthly contract payments made under ESSPPTAs. Further discussion of the revenue requirements is in the testimony of Michael R. Woodruff.

Once the revenue requirements were established, the Cost Development Team added a 5% contingency to address potential cost increases and/or overruns on the utility owned projects.

The 5% contingency was added to the present value of the revenue requirement,[15] and the sum of revenue requirement and the contingency for each offer was sent to the Bid Evaluation Team. At that point, the scope of work for the Cost Development Team was largely complete.

IV. PROPOSED UTILITY OWNED ENERGY STORAGE PROJECTS

A. Overview

SDG&E executed two agreements for utility owned storage systems arising from of the Preferred Resources LCR RFO: a Build-Own-Transfer ("BOT") agreement with AES Energy Storage, LLC ("AES") and an Engineering, Procurement and Construction ("EPC") agreement with RES America Construction, Inc. ("RES"), as shown below in Table 1, below. Discussion of the details related to each agreement follows.

Table 1: Utility Owned Storage Projects

Developer	Project Name	Location	Capacity (MW)	Expected COD	Term (Years)
AES	Fallbrook BESS	Fallbrook, CA	40 MW/160 MWh	03/31/2021	20
RES	Miramar BESS	San Diego, CA	30 MW/120 MWh	12/31/2019	20

B. AES Fallbrook BESS

1. Project Overview

The Fallbrook BESS is a 40 MW, 160 MWh lithium ion battery storage project that will be constructed by AES under a BOT agreement. The proposed on-line date is March 31, 2021. Under the BOT agreement, the Fallbrook BESS will be constructed on AES-owned land, and all permitting, project development, interconnection and construction activities will be AES's responsibility. The Fallbrook BESS will be located [redacted] in Fallbrook,

[15] Because the 5% contingency budget was added to the net present value of the revenue requirement, it included non-direct costs and a discount for the time value of those funds, and so the actual contingency budget as a percentage of actual direct costs is lower.

1 California, [redacted]

[redacted]

2. Safety Considerations

SDG&E takes efforts to ensure its energy storage procurements yield storage systems that are designed, constructed and operated safely, regardless of use case or ownership structure. For utility owned energy storage systems such as this one, SDG&E undertakes a comprehensive evaluation of all components of each project, including evaluation of the contractor's prior experience in safely constructing and operating energy storage systems, the technical merit of the proposed system, and the project's safety components. In addition, AES must construct the Fallbrook BESS in compliance with SDG&E's Energy Storage Technical Specification in the BOT agreement ("BOT Technical Specification"). Safety considerations and requirements are embedded throughout the BOT Technical Specification. Some highlights include:

- Site-Specific Safety Plan: AES must develop and comply with a site-specific safety plan designed to minimize risk of injury to the workforce and public during installation, maintenance, and operation. Among other requirements, the site-specific safety plan must include incident reporting and safety statistics tracking mechanisms, site security provisions, emergency and fire management practices, and CalOSHA compliance.
- Fire safety requirements: The Fallbrook BESS including the batteries, power conversion system, and site energy controller, and building will be designed, manufactured, and tested in compliance with the latest version

(including any issued revisions) of the California Fire Code ("CFC"). The project includes a water-based fire suppression system designed in accordance with National Fire Protection Association ("NFPA") 2001 and the CFC, and will contain both visual and audible fire alarms. The contractor is required to incorporate all safety design criteria required by the local permitting and fire authorities. In addition, the building's exterior walls must be 2-hour fire rated per the California Building Code ("CBC"), CFC, and NFPA. Finally, to mitigate and contain potential damage during a fire event, the building that houses the energy storage system will be subdivided into fire areas containing no greater than 25% of asset value, and each fire area will be separated with 2-hour fire barriers.

- Seismic safety requirements: The structural components of all buildings, shelters, free standing structures, structural equipment supports, equipment, and all associated foundations and anchorages will be designed and constructed to withstand the effects of earthquake motions and seismic loading in accordance with the requirements of the 2016 California Building Code and American Society of Civil Engineers ("ASCE") 7-10 with supplements No. 1 & 2, and using the following parameters: Risk Category III, Seismic Design Category D, Site Soil Class D.

In addition to the contractual safety considerations, SDG&E hired Geosyntec Consultants to perform a comprehensive Preliminary Safety Assessment ("PSA") of the Fallbrook BESS. The objectives of the PSA are to evaluate safety issues related to the installation and use of the

proposed Fallbrook BESS, using "what-if" techniques to identify hazardous scenarios that may occur as a result of equipment malfunctions, human errors, external events or other causes. Lessons learned from previous similar projects were incorporated into the initial PSA. No high risk/high priority items were identified in the PSA, and the PSA team concluded that there are no major hazards anticipated in association with the construction and operation of the project that cannot be mitigated. SDG&E will continue to reinforce safety considerations during the development and design of the Fallbrook BESS, and intends to implement the PSA's recommendations.

3. Project Benefits and Costs

To ascertain the benefits of the BOT agreement, SDG&E completed a least-cost, best-fit analysis including quantitative and qualitative assessments, and this offer and the resulting agreement competed successfully, as detailed in the testimony of Scot Rolfe. The confidential version of the IE report[16] also addresses the reasonableness of the terms and conditions of this agreement, as well as the attractiveness of the value proposition represented by the agreement. A full copy of the agreement is included as Confidential Attachment B.

The following table provides details around the assumed capital direct costs, as well as operations and maintenance ("O&M") direct costs associated with the Fallbrook BESS. All values are shown on a nominal basis.

[16] The IE report is Attachment J to the testimony of Patrick K. Charles.

1 [redacted]

[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
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[redacted]

[redacted]

C. RES America's Miramar BESS

1. Project Overview

The Miramar BESS is a 30 MW, 120 MWh lithium ion battery storage project that will be constructed at SDG&E's Miramar facility under an EPC agreement with RES America Construction, Inc. The proposed on-line date is December 31, 2019.[18] The Miramar BESS will be located on existing SDG&E substation property in the City of San Diego, near SDG&E's Miramar facility and on land adjacent to two (2) old, inefficient gas peaking plants that were retired in early 2017. The Miramar BESS project site provides an ideal location for leveraging existing interconnection capacity to repower the site with a modern, grid-scale battery resource at minimal cost.

RES will install the battery system [redacted] using batteries and inverters from top-tier manufacturers. [redacted]

[18] [redacted]

[redacted]

2. Safety Considerations

SDG&E takes efforts to ensure its energy storage procurements yield storage systems that are designed, constructed and operated safely, regardless of use case or ownership structure. For utility owned energy storage systems such as this one, SDG&E undertakes a comprehensive evaluation of all components of each project, including evaluation of RES' prior experience in safely constructing and operating energy storage systems, the technical merit of the proposed system, and the project's safety components. In addition, RES must construct the Miramar BESS in compliance with SDG&E's Energy Storage Technical Specification in the EPC agreement ("EPC Technical Specification"). Safety considerations and requirements are embedded throughout the EPC Technical Specification. Some highlights include:

- Site-Specific Safety Plan: RES must develop and comply with a site-specific safety plan designed to minimize risk of injury to the workforce and public during installation, maintenance, and operation. Among other requirements, the site-specific safety plan must include incident reporting and safety statistics tracking mechanisms, site security provisions, emergency and fire management practices, and CalOSHA compliance.

- Fire safety requirements: The Miramar BESS including the batteries, power conversion system, and site energy controller, and building will be designed, manufactured, and tested in compliance with the latest version (including any issued revisions) of the California Fire Code. The project includes a gas-based, clean agent fire suppression system designed in accordance with NFPA 2001 and the CFC, and will contain both visual and audible fire alarms. In addition, the building's exterior walls must be 2-hour fire rated per the CBC, CFC, and NFPA. Finally, to mitigate and contain potential damage during a fire event, the building that houses the energy storage system will be subdivided into fire areas containing no greater than 25% of asset value, and each fire area will be separated with 2-hour fire barriers.

- Seismic safety requirements: The structural components of all buildings, shelters, free standing structures, structural equipment supports, equipment, and all associated foundations and anchorages will be designed and constructed to withstand the effects of earthquake motions and seismic loading in accordance with the requirements of the IEEE 693 High Seismic Standards.

As with the Fallbrook BESS, SDG&E engaged Geosyntec Consultants to perform a comprehensive PSA for the Miramar BESS. The objectives of the PSA are to evaluate safety issues related to the installation and use of the proposed Miramar BESS, using "what-if" techniques to identify hazardous scenarios that may occur as a result of equipment malfunctions, human errors, external events or other causes. Lessons learned from previous similar projects were incorporated into the initial PSA. No high risk / high priority items were identified in the PSA, and the PSA team concluded that there are no major hazards anticipated in association with the construction and operation of the project that cannot be mitigated. SDG&E will continue to reinforce safety considerations during the development and design of the Miramar BESS, and intends to implement recommendations in the PSA.

3. Project Benefits and Costs

To ascertain the attractiveness of the EPC agreement, SDG&E completed a least-cost, best-fit analysis including quantitative and qualitative assessments, and this offer and the resulting agreement competed successfully, as detailed in the testimony of Scot Rolfe. The confidential version of the IE report also addresses the reasonableness of the terms and conditions of this agreement, as well as the attractiveness of the value proposition represented by the Agreement. A full copy of the agreement is included as Confidential Attachment C.

The following table provides details around the assumed capital direct costs, as well as operations and maintenance ("O&M") direct costs associated with the Miramar BESS.

[redacted]

[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

[19] [redacted]

V. QUALIFICATIONS

My name is Joshua Gerber and I am the Manager of Advanced Technology Integration in SDG&E's Asset Management division. My business address is 8315 Century Park Court, San Diego, California 92123. 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 Energy 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 previously provided testimony to the Commission.

This concludes my prepared direct testimony.

ATTACHMENT A

ADDENDUM to Preferred Resources LCR RFO:

Energy Storage Product Type RFO Document

SAN DIEGO GAS AND ELECTRIC COMPANY
SUPPLY MANAGEMENT DEPARTMENT
8315 CENTURY PARK COURT, CP21D
SAN DIEGO, CA 92123

ADDENDUM

SDG&E'S ENERGY STORAGE SYSTEM ("ESS")

2016

LOCAL CAPACITY REQUIREMENT

REQUEST FOR OFFERS ("RFO")

Seeking

ENERGY STORAGE SYSTEM

POWER PURCHASE TOLLING AGREEMENTS

ENERGY STORAGE SYSTEM TURN-KEY

BUILD, OWN, TRANSFER AGREEMENTS

ENERGY STORAGE SYSTEM TURN-KEY

ENGINEERING, PROCUREMENT, & CONSTRUCTION AGREEMENTS

REVISION 2

ISSUED
MARCH 18, 2016
REVISED
APRIL 13, 2016

OFFERS DUE
MAY 16, 2016

EMAIL QUESTIONS/COMMENTS TO
Power Advocate or 2016ESSEPCBOTRFO@semprautilities.com

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1.0 BACKGROUND

In accordance with Decision (D.) D. 14-03-004 – Decision Authorizing Long-Term Procurement for Local Capacity Requirements due to the Permanent Retirement of the San Onofre Nuclear Generation Station (the "Track 4 Decision") approved on March 13, 2014, and associated documents, and D.13-10-040 – Decision Adopting Energy Storage Procurement Framework and Design Program (the "Energy Storage Decision") approved on October 17, 2013, San Diego Gas and Electric Company ("SDG&E") issued its 2016 Preferred Resources LCR Energy Storage System Request for Offers ("2016 Energy Storage RFO" or "ESS RFO") on February 26, 2016 to solicit offers from owners and operators of ES facilities, ES developers and ES developers / equipment suppliers.[1]

The RFO solicits offers for both third party owned, contracted resources and two types of utility owned resources. This Addendum and accompanying documents apply only to offers for utility owned storage resources; specifically,

1) Offers from ESS developers to negotiate and enter into an Energy Storage System Turn-key Build, Own, Transfer Agreement ("ESSBOT") under which the ESS developers would construct an ESS project on its land and SDG&E would acquire the ESS project from the ESS developer upon project completion, and;

2) Offers from ESS developers / contractors / equipment suppliers to negotiate and enter into an Energy Storage System Turn-key Engineering, Procurement and Construction Agreement ("ESSEPC") under which the ESS developers / contractors / equipment suppliers would construct an ESS facility on SDG&E land.

While the February 26, 2016 Energy Storage RFO governs the solicitation, this Addendum describes additional requirements for processes for ESSBOT and ESSEPC offers, and sets forth each Respondent's obligations, describes the procedures that each Respondent must adhere to, and outline the pre-evaluation process each conforming offer will undergo. SDG&E will ultimately own ESSEPC or ESSBOT projects arising from this solicitation, and SDG&E shareholders may assume some risk of project cost overruns, system underperformance and/or failure. Accordingly, SDG&E will pre-evaluate all ESSBOT and ESSEPC offers to screen counterparties and proposed projects, and minimize counterparty risk associated with bids that are ultimately submitted to SDG&E's Bid Evaluation Team. The Pre-evaluation Criteria will assess counterparty risk, technical merit of the proposed system, and cost. High scoring offers identified in the pre-evaluation process will be submitted by SDG&E's Cost Development team to SDG&E's Bid Evaluation team by the Closing Date. These offers will then be evaluated against all other product types solicited in the 2016 Preferred Resource RFO to determine overall cost-effectiveness. Offers receiving low scores in the pre-evaluation process will not be submitted to the Bid Evaluation team.

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[1] See http://www.sdge.com/procurement/sdge-2016-preferred-resources-request-offers-seeking-energy-storage-system-ess-power. SDG&E is issuing this 2016 ESS RFO to achieve its megawatt ("MW") targets established in the Energy Storage Decision and to help meet its remaining Local Capacity Requirements ("LCR") established in the Track 4 Decision. As authorized in the Track 4 Decision, and following SDG&E's 2014 All Source RFO, SDG&E is seeking up to 140 MW in this solicitation. To summarize, this RFO is intended to meet both the Track 4 Decision requirements and the Energy Storage Decision requirements.

The intent of the pre-evaluation process is to identify low risk counterparties and projects. If all Respondents and proposed projects score highly in the pre-evaluation, then all offers from those Respondents will be forwarded to the Bid Evaluation Team on the Closing Date.

Specifically, the Addendum provides an overview of the process that SDG&E's Cost Development Team will use to pre-evaluate ESSEPC and ESSBOT offers, and includes detailed information regarding:

- Schedule for ESSBOT and ESSEPC offers;
- Overview of the pre-bid process and offer submittal process for ESSEPC and ESSBOT Respondents;
- Participation criteria/requirements for ESSEPC and ESSBOT Respondents;
- Pre-evaluation and ranking process description;
- Price/benefits refresh opportunity for highly-ranked Respondents;
- Offer-to-revenue-requirement conversion process description;
- Process for Cost Development Team to submit final offers by the Closing Date.

SDG&E EMPHASIZES HERE THAT THE FEBRUARY 26, 2016 ENERGY STORAGE RFO GOVERNS THIS SOLICITION. RESPONDENTS **MUST COMPLY** WITH ALL TERMS, CONDITIONS AND REQUIREMENTS OUTLINED IN THE RFO. REQUIREMENTS, TERMS AND CONDITIONS OUTLINED IN THIS ADDENDUM ARE IN ADDITION TO THE REQUIREMENTS, TERMS AND CONDITIONS DESCRIBED IN THE 2016 ENERGY STORAGE RFO.

For a ESSEPC or ESSBOT proposal to be considered in this RFO, an offer must be uploaded to Power Advocate®, in accordance with this RFO Addendum schedule no later than 1:00 PM Pacific Prevailing Time ("PPT"), on May 16, 2016. Offers shall not be accepted that do not comply with the terms of this Addendum.

The Addendum Schedule is subject to change at SDG&E's sole discretion at any time. All changes to the Addendum Schedule will be posted to Power Advocate®. The Addendum Schedule may be affected by (but not limited to) issues such as: discussions proceedings before the CPUC, and efforts to obtain regulatory approval. SDG&E intends to notify Respondents of any schedule change, but will not be liable for any change in schedule or for failing to provide notice of any change. A schedule detailing SDG&E's plans throughout the entire initial program period can be found in Section 5.0.

SDG&E will seek CPUC approval of executed Agreement(s) resulting from this RFO. Full performance under the executed Agreement(s) shall be contingent on obtaining CPUC approval.

2.0 PRE-EVALUATION PROCESS

SDG&E will ultimately own ESSEPC or ESSBOT projects arising from this solicitation, and SDG&E shareholders will assume some risk of project cost overruns, system underperformance and/or failure. Accordingly, a pre-evaluation and offer ranking process is necessary to screen all potential ESSEPC and ESSBOT counterparties and projects, and minimize counterparty risk associated with bids that are ultimately submitted to SDG&E's Bid Evaluation Team. High scoring offers identified in the pre-evaluation process will be submitted by SDG&E's Cost Development team to SDG&E's Bid Evaluation team by the Closing Date. These offers will then be evaluated against all other product types solicited in the 2016 Preferred Resource RFO to determine overall cost-effectiveness. Low scoring offers will not be submitted to the Bid Evaluation team.

Respondents to this solicitation shall comply with the requirements described in both the February 26, 2016 ESS RFO document, and this Addendum.

SDG&E will conduct a competitive pre-evaluation analysis of each proposal submitted utilizing the criteria and processes outlined below. All ESSEPC and ESSBOT proposals shall meet the minimum eligibility requirements as set forth in both the February 26, 2016 ESS RFO document, and Section 3.0 of the Addendum. Respondents must complete all tabs and required fields in both the 2016 RFO Offer form and the ESSEPC/ESSBOT Supplemental Offer Form. All offers will be evaluated in accordance with the Minimum Eligibility and Pre-evaluation Criteria described in Section 4.0 of the Addendum.

SDG&E reserves the right to reject any and all bids.

3.0 ELIGIBILITY REQUIREMENTS

The *general* participation criteria for all ESS Respondents in this RFO must be met, and are found in Section 3.0(A) of the February 26, 2016 ESS RFO document. Additional *specific* requirements for both ESSBOT and ESSEPC Respondents appear in Section 3.0(B), below. Respondents not meeting both the general and specific participation criteria may be deemed ineligible / nonconforming and their offers may not be considered.

A. General Participation Criteria

All ESSEPC and ESSBOT Respondents MUST meet all Participation Criteria found in Section 3.0(A) Preferred Resources LCR RFO Energy Storage Systems Procurement document issued on February 26, 2016.

https://www.sdge.com/sites/default/files/documents/940523929/2016%20SDGE%20PrefRes%20RFO%20Energy%20Storage.pdf?nid=17216

B. Specific Participation Criteria for All ESSBOT and ESSEPC Respondents

1. For ESSBOT and ESSEPC offers, the Cost Development team prefers start dates in 2020 or early 2021. This preference reflects realistic estimates of the time required for contract execution, contract approval, discretionary permitting, project construction, and testing. The resource must be on-line by Q3 2021. Some portion of the project's delivery term must include the entire calendar year of 2022.

2. The Respondent must disclose any affiliate relationship it has with Sempra Energy or any of its subsidiaries or affiliates, if one exists.

3. Respondents must price in Operations and Maintenance ("O&M") services that include O&M services through the end of the expected useful life of the equipment. Variable and fixed O&M cost estimates must be included in the ESSEPC/ESSBOT Supplemental Offer Form. These costs will be paid on an annual basis. It is assumed that these costs may vary from year to year. To the extent possible, the Cost Development Team prefers O&M costs to show in the year in which they are likely to occur, rather than appearing as annual levelized costs.

4. Respondents shall price in a Capacity Guarantee for all ESSEPC and ESSBOT offers. This guarantee will maintain both power and energy. SDG&E requires that Respondents guarantee the rated capacity of the ESS for each offer's stated term. Respondents will recover costs associated with the capacity guarantee through a Long Term Services Agreement ("LTSA") or similar mechanism throughout the stated term. The Cost Development Team prefers an augmentation strategy to address capacity degradation where capacity degradation is a function of cycles and depth of discharge. Ideally, base system capacity should be sufficient to cover one year of operation assuming the base offer's maximum annual cycles, or a similar strategy that minimizes

the net present value of life cycle costs. Capacity Guarantee costs must be included in the Cost Tab of the ESSEPC/ESSBOT Supplemental Offer Form.

5. Respondents shall price in an Availability Guarantee and an Efficiency Guarantee for all ESSEPC and ESSBOT offers. A general outline of the Availability Guarantee and the Efficiency Guarantee are provided in Schedule D.

6. Respondents shall certify residual capacity for all ESSEPC and ESSBOT offers by confirming that the supplied capacity degradation curve applies in the post-term period. For each offer, Respondent must include a residual capacity value associated with each base offer's stated term, capacity, and maximum annual deep cycle limitations (exclusive of optional incremental Flexible RA) by completing columns C (Year) and D (Annual Residual Capacity) of the Residual Capacity Table in the ESS UOG Cap-Price tab of the 2016 ESS Offer Form.

   Because of the ongoing maintenance required to preserve and uphold the required capacity guarantee outlined in Paragraph 4, above, the ESS should have 100% of its initial rated capacity at the end of the stated term. This resource can therefore be operated for some additional period, and provide residual capacity and energy benefits without incurring additional capacity and capacity guarantee costs.

   For example, suppose a Respondent's base offer was for 10 MW/40 MWh ESS resource with 365 annual deep cycles, and 15 year useful life with associated 15 year capacity guarantee. At the beginning of year 16, the ESS will, because of the capacity guarantee, have 100 % of its rated capacity, or 10 MW/40 MWh. In year 16 (and beyond) SDG&E would continue to use the ESS resource within the base offer parameters (in this case, no more than 365 annual deep cycles), but would no longer incur variable and fixed O&M costs associated with the capacity guarantee. This continued use will provide a residual capacity benefit that outlasts the project's initial term. However, because the capacity is no longer being maintained, this continued use will degrade the ESS capacity at some quantifiable percentage each year of continued use. For each offer, Respondents must specify the post-capacity degradation rate for each offer's specified base use profile (i.e., maximum annual deep cycles). The residual capacity for each base offer will be verified using the capacity degradation curve supplied by Respondents in the Capacity Degradation Tab of the ESSEPC/ESSBOT Supplemental Offer Form.

   Additional discussion of the residual capacity concept, and examples of how Respondents will incorporate the concepts into the bid materials, will be provided at the March 28, 2016 ESSBOT and ESSEPC Bidder Conference.

7. Acceptable project size/capacity range.
   a. ESSBOT Respondents - minimum size of 10 MW and maximum size of 140 MW.
   b. ESSEPC Respondents - minimum and maximum ESS facility sizes vary by location. Specific limits for each ESSEPC location are found in Schedule C and are available to ESSEPC Respondents after NDA execution.

8. Interconnection requirements for all ESS are specified in Section 4.0 of February 26, 2016 ESS RFO document. Additional interconnection detail for ESSBOT and ESSEPC Respondents is found below.
    a. ESSBOT Respondents have responsibility for development, land acquisition, permitting, financing and construction of the ESS facilities. ESSBOT offers shall include all costs associated with interconnecting the facility.
        i. Offers shall include Phase 1 study cost estimates required to make the project deliverable to the CAISO grid, or shall describe the project's ability to be considered a repower under the CAISO's Business Practice Manual for Generator Management.
    ii. Offers shall also include cost estimates for physical interconnection, including all switchgear and step-up transformers required for the project's identified interconnection voltage.
    b. ESSEPC Respondents are responsible for procuring and installing all switchgear and step-up transformers to the site-specific interconnection voltage identified by SDG&E in Schedule C. Respondents shall include these interconnection cost estimates in their ESSEPC offers. SDG&E is responsible for construction and costs associated with interconnecting the project from the high side of the step-up transformer to the grid. SDG&E will develop cost estimates for this interconnection activity, and will include those costs in each ESSEPC offer.

9. ESSBOT and ESSEPC offers must include a permitting plan and estimate of costs for identified responsibilities.
    a. ESSBOT Respondents must include a permitting plan describing the required permits to construct and operate the facility for the duration of the proposed term.
    b. ESSEPC project permitting responsibilities will be split between ESSEPC Respondents and SDG&E.
        i. SDG&E is responsible for obtaining discretionary and/or major-use environmental permitting, and will develop a permitting plan and cost estimates for these activities. SDG&E is responsible for any compensatory mitigation and mitigation monitoring and compliance costs associated with any environmental permit it obtains.
        ii. ESSEPC Respondents are responsible for obtaining all other permits (building, transportation, etc.), and must include a permitting plan and cost estimates related to these activities. ESSEPC Respondents are responsible for all costs associated with these ministerial permits, and is responsible for compliance, mitigation measures or other conditions of approval associated with those permits.

C. Additional Specific Criteria for ESSEPC Respondents Only

The following criteria applies to ESSEPC Respondents only.

1. The energy storage equipment must fit within the designated site-specific footprints provided in Schedule C.
2. ESSEPC projects must observe all zoning setbacks from property line, building height limitations, and noise limitations identified in Schedule C.

3. ESPEPC Respondents may modify the ESSEPC Pro Forma provided in Schedule B and B1 and submit such modifications in their offer package provided such modifications add value to the offer. However, SDG&E discourages extensive modifications and will consider materiality of such changes on a qualitative basis as it evaluates the offers received.

4. The energy storage equipment must meet the technical requirements outlined in ESS Technical Specification provided to ESSEPC Respondents in Schedule A. ESPEPC Respondents may modify the ESSEPC ESS Technical Specification and submit such modifications in their offer package provided such modifications add value to the offer. However, SDG&E discourages extensive modifications and will consider materiality of such changes on a qualitative basis as it evaluates the offers received.

5. SDG&E reserves the right at its sole discretion to terminate or eliminate a proposed project site identified in Schedule C prior to contract execution without the obligation to pay for costs incurred by the Respondent.

4.0 MINIMUM ELIGIBILITY AND PRE-EVALUATION PROCESS AND CRITERIA

A. MINIMUM ELIGIBILITY CRITERIA

All incoming proposals will be assessed for conformance with minimum eligibility criteria. Respondents must conform to minimum eligibility criteria to be considered. The Cost Development Team will utilize all the information provided in the required forms and narratives to assess proposals for eligibility. Respondents are responsible for the accuracy of all the discussions, figures and calculations. Errors discovered during the evaluation may impact a Respondent's participation.

Minimum eligibility criteria includes:

1. Commercial Viability:
    a. General Criteria – Storage Systems.
        iii. At least one commercial (non-demonstration) installation with grid-connected 1 MW /1 MWh (1 MW *and* 1 MWH) or greater power/energy rating;
            1. with additional contracts for 3 or more 1 MW /1 MWh (or greater) units;
            2. in continuous operation for at least one year (with the exception of unplanned outages, see below);
                1. with no more than 15 days of unplanned outages in the last year; and
                2. Which has operated through at least 25 full equivalent discharge cycles in the last year and able to meet discharge requirements set forth in this RFO (3 hours continuous at full power rating).
        ii. Respondents must show experience with post commercial operation trouble shooting and warranty performance for all components of 1 MW+ scale grid-connected energy storage systems it has constructed, including communications and controls.
    b. Equipment

i. The proposed Energy Storage Media/Battery must been have been previously utilized in at least one commercial (non-demonstration) installation with grid-connected 1 MW (or greater) power capacity.
ii. The proposed Power Conversion System (PCS) must been have been previously utilized in at least one commercial (non-demonstration) installation with grid-connected 1 MW (or greater) power capacity.
iii. The proposed Control System must been have been previously utilized in at least one commercial (non-demonstration) installation with grid-connected 1 MW (or greater) power capacity.
iv. The Respondent shall state exactly what equipment is included in the offer. For example, ESS modules, control systems, inverters (as applicable), etc.
v. The proposed Energy Storage Media/Battery must have manufacturing capacity of at least 20 MWh annually in compliance with ISO 9001 requirements.

In addition to the elements described above, SDG&E may also reject an offer if:

1. SDG&E uncovers evidence of market manipulation in the bid preparation and offer process;

2. the Respondent does not provide adequate evidence that it meets minimum eligibility criteria;

3. the Respondent cannot fulfill the terms and conditions of the Agreement; and/or,

4. The Respondent is unable to comply with RFO timing and other solicitation requirements.

B. PRE-EVALUATION PROCESS AND CRITERIA

As described above, SDG&E will ultimately own ESSEPC or ESSBOT projects arising from this solicitation, and SDG&E shareholders will assume some risk of project cost overruns, system underperformance and/or failure. Accordingly, SDG&E will pre-evaluate all ESSBOT and ESSEPC offers to screen counterparties and proposed projects, and minimize counterparty risk associated with bids that are ultimately submitted to SDG&E's Bid Evaluation Team. High scoring offers identified in the pre-evaluation process will be submitted by SDG&E's Cost Development team to SDG&E's Bid Evaluation team by the Closing Date. These offers will then be evaluated against all other product types solicited in the 2016 Preferred Resource RFO to determine overall cost-effectiveness. Offers receiving low scores in the pre-evaluation process will not be submitted to the Bid Evaluation team.

To reiterate, the intent of the pre-evaluation process is not to simply shorten the list of Respondents to some pre-determined number. Rather, the goal is to identify low risk counterparties and projects. If all Respondents and proposed projects score highly in the pre-evaluation, then all offers from those Respondents will be forward to the Bid Evaluation Team on the Closing Date.

The pre-evaluation process is focused primarily on the following areas.

- Technical Merit of the Proposed System, including:
  - Proposed equipment
  - Project design/Layout
  - Performance/Operation
  - Environmental/Health/Safety
  - Exceptions to Schedule A (Technical Specification)

- Respondent's Experience/Financial viability/Risk
  - Respondent's prior project experience with energy storage systems (particularly of systems of the same MW/MWh size as those being offered, and/or capabilities sought in the RFO)
  - Respondent's prior experience providing post commercial operation support and services
  - Respondent's overall financial health and stability
  - Exceptions to Schedule B and B1 (pro forma EPC contract and Exhibits): EPC Bidders Only

- Overall System Cost
  - CapEx
  - Fixed and Variable O&M

SDG&E WILL NOT REIMBURSE RESPONDENTS FOR THEIR EXPENSES UNDER ANY CIRCUMSTANCES, REGARDLESS OF WHETHER THE RFO PROCESS PROCEEDS TO A SUCCESSFUL CONCLUSION OR IS ABANDONED BY SDG&E IN ITS SOLE DISCRETION.

C. PRICE/BENEFITS REFRESH OPPORTUNITY FOR RESPONDENTS PASSING THE MINIMUM ELIGIBILITY AND PRE-EVALUATION SCREENS

On May 27, 2016, the Cost Development Team will notify all Respondents of the pre-evaluation process results, and provide each with a limited opportunity to refresh some components of their base offer(s). This refresh opportunity is designed to generate the highest value /lowest cost offers prior to final submission to the Bid Evaluation Team for evaluation against other storage offers, and offers from other preferred resources. The price/value refresh opportunity for Respondents passing the initial pre-evaluation screens is optional; offers passing the initial pre-evaluation screens will be forwarded to the Bid Evaluation Team whether or not the Respondent elects to refresh any, all or none of the base offer components available for refresh.

From May 27, 2016 to June 3, 2016, all high scoring Respondents will have the opportunity to refresh identified aspects of their offers, subject to the following conditions.

- Overall Price: Respondents may make a *downward* adjustment in any offer's overall price. Respondents may not increase any offer's overall price.

- Variable and fixed O&M Cost Estimates ($/MWh and $/year): Respondents may adjust any offer's variable and fixed O&M cost estimates, but may not increase the project's overall price.

- Variable Cycle Offer Price for Optional Flex ($/MWh): Respondents may adjust any offer's Variable Cycle Offer Price for Optional Flex estimate, but may not increase the project's overall price.

- Residual Capacity value: Respondents may *increase* any offer's Residual Capacity, but may not increase the project's overall price. Respondents may not decrease any offer's warranted Residual Capacity Benefit.

- Cycling Restrictions: Respondents may *increase* any offer's maximum annual deep cycling limits, but may not increase the project's overall price. Respondents may not decrease any offer's stated maximum annual deep cycle limits.

5.0 RFO SCHEDULE

The following schedule and deadlines apply to the RFO Addendum for ESSEPC and ESSBOT offers. SDG&E reserves the right to revise this schedule at any time and in SDG&E's sole discretion. Respondents are responsible for monitoring Power Advocate for updated schedules and possible amendments to the RFO or Addendum processes.

No.	Item/EPC & BOT Deliverable	Date – REVISED (4/7/16)	Date - ORIGINAL
1	RFO Issued. ESSBOT and ESSEPC Respondents provide written expression of interest any time after February 26.	February 26, 2016	February 26, 2016
2	Deadline for Respondents to provide written expression of interest.	March 11, 2016	March 11, 2016
3	Deadline to receive executed NDA.	March 18, 2016	March 18, 2016
4.	SDG&E issues RFO Addendum to ESSEPC and ESSBOT Respondents. Respondents Receive: • Addendum document describing process, pre-evaluation criteria and schedule • ESSEPC/ESSBOT Supplemental Offer Form • Schedule A: Energy Storage Technical Specification ESSEPC Respondents also receive: • Schedule B: Energy Storage EPC pro forma • Schedule B1: Pro Forma Exhibits • Schedule C: ESSEPC site descriptions, including project footprints, setback, height limitations, interconnection points, etc.	March 18, 2016	March 18, 2016
5	ESSEPC and ESSBOT Bidder conference(s)	March 28, 2016	March 28, 2016
6	Deadline to submit written questions	April 18, 2016	April 8, 2016
7	Deadline to post answers to Questions in Power Advocate®	April 25, 2016	April 18, 2016
8	ESSBOT and ESSEPC bid packages due	May 16, 2016	April 25, 2016
9	Cost Development Team begins pre-evaluation and ranking process	May 17, 2016	April 26, 2016
10	Cost Development Team notifies highly ranked Respondents	May 31 – June 17, 2016	May 27, 2016
11	Highly ranked Respondents have opportunity to "refresh" prices/benefits prior to revenue requirement calculation.	Five business days from date of notification	May June 27 – June 3, 2016
12	Cost Development Team converts highly	June 1 – June 29,	June 3, 2016

	ranked BOT and EPC offers to revenue requirements	2016	
13	**CLOSING DATE**: Cost Development Team submits adjusted bids to SDG&E Bid Evaluation Team. Highly ranked ESSEPC and ESSBOT offers from pre-evaluation process and supporting documentation uploaded to the 2016 Preferred Resource RFO Website.	July 1, 2016	July 1, 2016

BIDDER CONFERENCE

The Cost Development Team will host a Bidder Conference for ESSEPC and ESSBOT Respondents at 10:00 a.m. on March 28, 2016. This event will provide a forum to discuss issues/questions relevant to the ESSEPC and ESSBOT offer process and pre-evaluation process.

Respondents who provide written expression of interest by March 11, 2016, and ESSEPC Respondents who execute the NDA by March 18, 2016 may attend the bidder conference.

Event: ESSEPC/ESSBOT Bidder Conference
Date: March 28, 2016
Time: 10:00 – Noon.
Location: SDG&E's Lightwave Facility
9305 Lightwave Ave, San Diego, CA 9212

Please monitor Power Advocate® for further details (such as conference presentation materials). SDG&E will make efforts to notify Respondents of conference details via e-mail as well as providing this information via Power Advocate®.

In addition, SDG&E's Bid Evaluation Team will host a bidder outreach event on April 18, 2016 for all respondents to the 2016 Preferred Resource LCR RFO.

Though participation in these events is NOT required to submit an offer, SDG&E encourages participation in both events.

6.0 RFO WEBSITE AND RESPONSE INSTRUCTIONS

Respondents to the ESSEPC and ESSBOT product types in the 2016 ESS LCR RFO must register for and access the 2016 ESSEPC/ESSBOT RFO ADDENDUM event on the PowerAdvocate® website. All documents related to ESSEPC and ESSBOT offers, as well as subsequent revisions, will be available for download from PowerAdvocate®. Respondents are responsible for monitoring PowerAdvocate® for subsequent updates, notices and postings.

All Respondents who provide a formal expression of interest for the ESSEPC and/or ESSBOT product types will receive email instructions describing the process to register for PowerAdvocate®.

2016 ESSEPC/ESSBOT RFO ADDENDUM event on the PowerAdvocate® website will contain the following documents for download for all Respondents:

- ESSEPC/ESSBOT Addendum Document
- ESSEPC/ESSBOT Supplemental Offer Form
- Project Description Form
- Credit Application
- Diverse Business Enterprise Subcontracting Commitment and Reporting Requirements Form

ESSEPC Respondents who execute the required NDA will receive the following additional Documents

- Schedule A: Energy Storage Technical Specification
- Schedule B: Energy Storage EPC Pro Forma
- Schedule B1: Pro Forma Exhibits
- Schedule C: ESSEPC site descriptions, including project footprints, setback, height limitations, interconnection points, etc.

RESPONSE INSTRUCTIONS

Respondents are required to submit the documents described below in response to this solicitation. Failure to provide the listed information may result in the proposal being deemed non-conforming and may disqualify the proposal from further consideration.

On or before April 25, 2016, all ESSEPC and ESSBOT Respondents shall submit the following documents in tab 2, "Upload Documents" in PowerAdvocate® as part of this RFO Pre-evaluation Process:

1. Supplemental ESSEPC/ESSBOT Offer Form. Respondents <u>must complete all tabs and all fields</u> in the Supplemental ESSEPC/ESSBOT Offer Form.
2. Redline forms of Schedule A: Energy Storage Technical Specification. Respondent shall submit a redlined document with any exceptions to this specification. If no exceptions are taken, Respondent shall submit a signed letter on company letter head stating as such.
3. Redline form of Schedule B – Energy Storage EPC Pro Forma (EPC Respondents Only).

Respondent shall submit a redlined document with any exceptions to these requirements. If no exceptions are taken, Respondent shall submit a signed letter on company letter head stating as such.

4. Redline form of Schedule B1 – Pro Forma Exhibits (EPC Respondents Only). Respondent shall submit a redlined document with any exceptions to these requirements. If no exceptions are taken, Respondent shall submit a signed letter on company letter head stating as such

5. All required forms and documents for the 2016 Preferred Resource RFO[2], including:
    a. Energy Storage Offer Form
    b. Project Description Form
    c. Electric Interconnection / Repowering Information
    d. Credit Application
    e. Diverse Business Enterprise Subcontracting Commitment and Reporting Requirements Form (optional)

[2] These documents are available for download at http://www.sdge.com/procurement/sdge-2016-preferred-resources-request-offers-seeking-energy-storage-system-ess-power

7.0 REJECTION OF OFFERS

SDG&E SHALL TREAT ALL RESPONDENTS FAIRLY AND EQUALLY AND SHALL EVALUATE ALL OFFERS IN GOOD FAITH. WHILE SDG&E IS VIGOROUSLY PURSUING THE GOALS OF THE ENERGY STORAGE DECISION, SDG&E MAKES NO GUARANTEE THAT A CONTRACT AWARD SHALL RESULT FROM THIS RFO, EVEN AFTER AN OFFER HAS BEEN SHORTLISTED. SDG&E RESERVES THE RIGHT AT ANY TIME, AT ITS SOLE DISCRETION, TO ABANDON THIS RFO PROCESS, TO CHANGE THE BASIS FOR EVALUATION OF OFFERS, TO TERMINATE FURTHER PARTICIPATION IN THIS PROCESS BY ANY PARTY, TO ACCEPT ANY OFFER OR TO ENTER INTO ANY DEFINITIVE AGREEMENT, TO EVALUATE THE QUALIFICATIONS OF ANY RESPONDENT OR THE TERMS AND CONDITIONS OF ANY OFFER, OR TO REJECT ANY OR ALL OFFERS, ALL WITHOUT NOTICE AND WITHOUT ASSIGNING ANY REASONS AND WITHOUT LIABILITY OF SEMPRA ENERGY, SDG&E, OR ANY OF THEIR SUBSIDIARIES, AFFILIATES, OR REPRESENTATIVES TO ANY RESPONDENT. SDG&E SHALL HAVE NO OBLIGATION TO CONSIDER ANY OFFER.

8.0 CONFIDENTIALITY

EXCEPT WITH THE PRIOR WRITTEN CONSENT OF SDG&E, RESPONDENTS MAY NOT DISCLOSE (OTHER THAN BY ATTENDANCE ALONE AT ANY MEETING TO WHICH MORE THAN ONE RESPONDENT IS INVITED BY SDG&E) TO ANY OTHER RESPONDENT OR POTENTIAL RESPONDENT THEIR PARTICIPATION IN THIS RFO, AND RESPONDENTS MAY NOT DISCLOSE, COLLABORATE ON, OR DISCUSS WITH ANY OTHER RESPONDENT, OFFER STRATEGIES OR THE SUBSTANCE OF OFFERS, INCLUDING WITHOUT LIMITATION THE PRICE OR ANY OTHER TERMS OR CONDITIONS OF ANY INDICATIVE OR FINAL OFFER.

SDG&E WILL USE THE HIGHER OF THE SAME STANDARD OF CARE IT USES WITH RESPECT TO ITS OWN PROPRIETARY OR CONFIDENTIAL INFORMATION OR A REASONABLE STANDARD OF CARE TO PREVENT DISCLOSURE OR UNAUTHORIZED USE OF RESPONDENT'S CONFIDENTIAL AND PROPRIETARY INFORMATION THAT IS LABELED AS "PROPRIETARY AND CONFIDENTIAL" ON THE OFFER PAGE ON WHICH THE PROPRIETARY INFORMATION APPEARS ("CONFIDENTIAL INFORMATION"). RESPONDENT SHALL SUMMARIZE ELEMENTS OF THE OFFER(S) IT DEEMS CONFIDENTIAL. THE SUMMARY MUST CLEARLY IDENTIFY WHETHER OR NOT PRICE, PROJECT NAME, LOCATION, SIZE, TERM OF DELIVERY AND TECHNOLOGY TYPE (EITHER COLLECTIVELY OR INDIVIDUALLY) ARE TO BE CONSIDERED CONFIDENTIAL INFORMATION. CONFIDENTIAL INFORMATION MAY BE MADE AVAILABLE ON A "NEED TO KNOW" BASIS TO SDG&E'S DIRECTORS, OFFICERS, EMPLOYEES, CONTRACTORS, CONSULTANTS, THE INDEPENDENT EVALUATOR, AGENTS AND ADVISORS ("REPRESENTATIVES"), BUT SUCH REPRESENTATIVES SHALL BE REQUIRED TO OBSERVE THE SAME CARE WITH RESPECT TO DISCLOSURE AS SDG&E.

NOTWITHSTANDING THE FOREGOING, SDG&E MAY DISCLOSE ANY CONFIDENTIAL INFORMATION OF ANY RESPONDENT TO COMPLY WITH ANY LAW, RULE, OR REGULATION OR ANY ORDER, DECREE, SUBPOENA OR RULING OR OTHER SIMILAR PROCESS OF ANY COURT, SECURITIES EXCHANGE, CONTROL AREA OPERATOR, GOVERNMENTAL AGENCY OR GOVERNMENTAL OR REGULATORY AUTHORITY AT ANY TIME EVEN IN THE ABSENCE OF A PROTECTIVE ORDER, CONFIDENTIALITY AGREEMENT OR NON-DISCLOSURE AGREEMENT, AS THE CASE MAY BE, WITHOUT NOTIFICATION TO THE RESPONDENT AND WITHOUT LIABILITY OR ANY RESPONSIBILITY OF SDG&E TO THE RESPONDENT.

IT IS EXPRESSLY CONTEMPLATED THAT MATERIALS SUBMITTED BY A RESPONDENT IN CONNECTION WITH THIS RFO WILL BE PROVIDED TO THE CPUC, ITS STAFF, THE CEC, ITS STAFF, SDG&E'S INDEPENDENT EVALUATOR, SDG&E'S PRG, AND THE COST ALLOCATION METHODOLOGY ("CAM") GROUP. ADDITIONALLY, SDG&E MAY PROVIDE LIMITED INFORMATION SUCH AS (BUT NOT LIMITED TO) ON-LINE DATE, INTERCONNECTION POINT, TECHNOLOGY AND OTHER OPERATIONAL CHARACTERISTICS TO THE CAISO FOR MODELING PURPOSES. SDG&E WILL SEEK CONFIDENTIAL TREATMENT PURSUANT TO PUBLIC UTILITIES CODE SECTION 583 AND GENERAL ORDER 66-C OF THE CPUC,

WITH RESPECT TO ANY RESPONDENT CONFIDENTIAL INFORMATION SUBMITTED BY SDG&E TO THE CPUC. SDG&E WILL ALSO SEEK CONFIDENTIALITY PROTECTION FROM THE CALIFORNIA ENERGY COMMISSION ("CEC") FOR RESPONDENT'S CONFIDENTIAL INFORMATION AND WILL SEEK CONFIDENTIALITY AND/OR NON-DISCLOSURE AGREEMENTS WITH THE PROCUREMENT REVIEW GROUP ("PRG"). SDG&E CANNOT, HOWEVER, ENSURE THAT THE CPUC OR CEC WILL AFFORD CONFIDENTIAL TREATMENT TO A RESPONDENT'S CONFIDENTIAL INFORMATION OR THAT CONFIDENTIALITY AGREEMENTS OR ORDERS WILL BE OBTAINED FROM AND/OR HONORED BY THE PRG, CEC, OR CPUC.

SDG&E, ITS PARENT COMPANY, SUBSIDIARIES, AND AFFILIATES, AND ITS AND THEIR STOCKHOLDERS, DIRECTORS, EMPLOYEES, OFFICERS, REPRESENTATIVES, SUCCESSORS AND ASSIGNS DISCLAIM ANY AND ALL LIABILITY ARISING OUT OF THE DISCLOSURE OF ANY OF RESPONDENT'S CONFIDENTIAL INFORMATION.

ATTACHMENT B

BOT Agreement

THIS DOCUMENT IS CONFIDENTIAL IN ITS ENTIRETY

ATTACHMENT C

EPC Agreement

THIS DOCUMENT IS CONFIDENTIAL IN ITS ENTIRETY