

Application: A.18-02-016

Exhibit: SDGE-

PUBLIC VERSION

REBUTTAL TESTIMONY OF

EVAN M. BIERMAN

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY



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

AUGUST 24, 2018

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	SDG&E’s PROPOSED INVESTMENTS MEET THE OBJECTIVES OF AB 2868 TO “MINIMIZE OVERALL COSTS AND MAXIMIZE OVERALL BENEFITS”	1
III.	SDG&E’s QUANTIFICATION OF PROJECT COST CAPS ARE REASONABLE	4
IV.	SDG&E’s MARKET STUDY IS A USEFUL INDICATOR OF POTENTIAL BENEFITS	6
V.	THE PROPOSED PROJECTS MAXIMIZE BENEFITS AND MINIMIZE COSTS	8
VI.	CONCLUSION.....	9

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19

**REBUTTAL TESTIMONY OF
EVAN M. BIERMAN**

I. INTRODUCTION

I previously submitted prepared direct testimony in support of this application.

II. SDG&E’s PROPOSED INVESTMENTS MEET THE OBJECTIVES OF AB 2868 TO “MINIMIZE OVERALL COSTS AND MAXIMIZE OVERALL BENEFITS”

Several parties¹ submitted testimony questioning whether SDG&E’s proposed AB 2868 circuit-level energy storage microgrid projects are the most cost-effective solution to meet the stated goals of AB 2868. Such questioning around cost-effectiveness misses the mark, as the appropriate issue is whether these projects have minimized costs and maximized benefits as specified in AB 2868. SDG&E focused on this requirement in developing its AB 2868 proposal for two reasons. First, cost-effectiveness is not a requirement for approval of AB 2868 projects. AB 2868, at P. U. Code § 2838.2(a)(b), plainly states, “Programs and investments proposed by the state’s three largest electrical corporations shall seek to minimize overall costs and maximize overall benefits.” Second, the term “cost-effective” is not found in the section 2838.2(a)(1) definition of “distributed energy storage system” which governs AB 2868, nor is it elsewhere in the statute.² In addition, the AB 2868 language statutory language mirrors the language in SB 350³ directing utilities to invest in transportation electrification: “minimize costs and maximize benefits.” In the SB 350 context, the Commission recently rejected contentions by TURN and

¹ Specifically the Office of Ratepayer Advocates (“ORA”), The Utility Reform Network (“TURN”), LS Power Development, LLC (“LS Power”), and Small Business Utility Advocates (“SBUA”).

² Cal. Public Utilities (“P.U.”) Code § 2838.2(a)(1): “Distributed energy storage system” means an energy storage system with a useful life of at least 10 years that is connected to the distribution system or is located on the customer side of the meter.” Contrast this definition with AB 2514 energy storage procurement, which requires an energy storage system to be “cost effective” (*see* P.U. Code § 2835(a)(2)(B)(3)).

³ Senate Bill 350, Stats. 2015, Chapter 547.

20 ORA similar to those here – that utility SB 350 applications were subject to quantitative cost-
21 effectiveness tests.⁴ This would seem to confirm my understanding based on the plain words of
22 the statute.

23 Much of the intervenor testimony mistakenly focuses on the cheapest way to simply
24 deploy energy storage (or reduce greenhouse gas (“GHG”) emissions), rather than focusing on
25 energy storage solutions that meet all of the objectives and requirements of AB 2868 - prioritize
26 public sector and low-income customers, achieve ratepayer benefits, reduce dependence on
27 petroleum, meet air quality standards, reduce emissions of GHG, while also seeking to minimize
28 overall costs and maximize overall benefits.⁵ Such an approach, failed to account for AB 2868’s
29 explicit goals. For this reason, much of the comparisons that intervenors attempt to make fall
30 woefully short of providing valid “apples-to-apples” comparisons. SDG&E’s proposed circuit-
31 level energy storage microgrid projects were designed to meet all the statutory goals of AB 2868,
32 while also minimizing overall costs and maximizing overall benefits.

⁴ D.18-05-040 at 90, rejected contentions by ORA and TURN as follows (footnotes omitted):

In addition, ORA and TURN argue that the utilities have not demonstrated that the proposed programs are in the interest of ratepayers, necessary, or the most effective means of accelerating transportation electrification, citing Pub. Util. Code § 740.12(b) for these “requirements.” The EJ Parties point out that no such requirements are found in the statute, only that “[p]rograms proposed by electrical corporations shall seek to minimize overall costs and maximize overall benefits” and that “SB 350 sets no thresholds for assessing cost-effectiveness, and does not require a quantitative cost-benefit analysis to show that the costs are outweighed by the benefits.”

The EJ Parties suggest, and we agree, that the utility medium- and heavy-duty programs generally propose to provide make-ready infrastructure to an appropriate number of sites, striving to “maximize the benefits of transportation electrification by targeting medium- and heavy-duty vehicles and equipment. These vehicles and equipment create significant levels of pollution, disproportionately impact disadvantaged communities, are ripe for electrification, are the targets of other public investment for electrification,

⁵ P.U. Code § 2838.2, *et seq.*

33 SDG&E appreciates TURN’s focus on customer costs and savings: “TURN finds that
34 other resources could be procured much more cost-effectively to reduce GHG emissions between
35 now and 2030.”⁶ TURN also contends that, “it is only through an integrated framework that
36 solutions should be procured for renewable integration.”⁷ SDG&E agrees that in isolation,
37 SDG&E’s proposed circuit-level energy storage microgrid projects may not be the most cost-
38 effective way to solely reduce GHG emissions – if that is the sole objective. SDG&E also agrees
39 with TURN that the Integrated Resource Plan (“IRP”) process⁸ is the best proceeding in which to
40 establish the most cost-effective way to address GHG emissions reductions. However, TURN
41 misses that, in the context of AB 2868’s objectives, GHG emission reductions is but one of many
42 enumerated goals and objectives listed (*i.e.*, accelerate the widespread deployment of distributed
43 energy storage systems which prioritize public sector and low-income customers, achieve
44 ratepayer benefits, reduce dependence on petroleum, meet air quality standards, *reduce emissions*
45 *of GHG*, while also seeking to minimize overall costs and maximize overall benefits). As
46 described in the Direct Testimony of Stephen Johnston,⁹ due to the multiple requirements
47 outlined in AB 2868, SDG&E established a project evaluation matrix and process to account for
48 the varied goals and objectives of AB 2868, which assisted SDG&E in its selection of energy
49 storage projects. Further, SDG&E’s proposed circuit-level energy storage projects will have the
50 ability to microgrid portions of the circuits thereby providing distribution resiliency to critical

⁶ TURN 15:24-25. Citations to testimony will be as follows: [Party nickname] (witness surname) page number(s):line number(s). Note that the citations to ORA will include the hyphens in the page numbers.

⁷ *Id.* at 15:2-3 (original emphasis).

⁸ SDG&E notes that it included AB 2868 energy storage in its 2018 Individual Integrated Resource Plan filed in R.16-02-007. *See* p. 9.

⁹ *See* SDG&E (Johnston) SJ-19:5 – SJ-20:9.

51 public sector customers as well as other incidental customers who are part of the microgrid.¹⁰
52 Intervenors have failed to demonstrate in totality how SDG&E's proposed AB 2868 circuit-level
53 energy storage microgrid projects do not meet all the statutory goals of AB 2868.

54 SDG&E has taken a prudent and measured approach to the design of these proposed
55 circuit-level energy storage microgrid projects and their use cases in order to meet the statute's
56 goals rather than just focusing on one issue (such as maximizing GHG benefits). For example,
57 SDG&E undertook a careful examination to determine each circuit's minimum load
58 requirements during islanding, and as a result designed most of the systems¹¹ to be one hour
59 duration systems instead of four. While four-hour duration systems would have provided
60 additional GHG benefits, SDG&E determined that the incremental GHG emissions reduction
61 benefits did not justify the additional costs to customers, which in some cases could have been as
62 much as four times the proposed costs of the one-hour duration system.

63 **III. SDG&E'S QUANTIFICATION OF PROJECT COST CAPS ARE REASONABLE**

64 TURN points to a recent nationwide EIA study¹² to justify why the cost cap is not
65 appropriate.¹³ This study fails to incorporate a few concepts pertinent to this application. Steven
66 Prsha's rebuttal testimony explains why the EIA cost estimates are not accurate for these seven
67 circuit-level energy storage microgrid projects.¹⁴ Separately, I will touch upon why TURN's
68 cost caps are erroneous. First, TURN used a national study that did not reflect local market

¹⁰ Rebuttal Testimony of Steven Prsha On Behalf of San Diego Gas & Electric Company at SP-4:17-22.

¹¹ There is one, two-hour duration system at Kearny which was designed as such due to the additional load present at that circuit during islanding.

¹² U.S. Energy Information Administration, *U.S. Battery Storage Market Trends* (May 2018) at 12. Available at https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery_storage.pdf.

¹³ TURN 13:1-15 and fn. 34.

¹⁴ SDG&E rebuttal (Prsha) SP-5:12-SP-6:22.

69 conditions. The cost to build and install equipment in the San Diego area is more expensive than
70 the national average. For example, out of 598 areas where the Bureau of Labor and Statistics¹⁵
71 gathered data for 2017, San Diego was ranked #505 for hourly construction labor rates (\$21.20)
72 vs. the median hourly labor rate for the #299 ranked area of Omaha, NE (\$16.50); or a 28%
73 premium in labor. [REDACTED]

74 [REDACTED]

75 [REDACTED]¹⁶ But if you take into account local market
76 conditions (reflected in the comparative labor rates quoted above) and apply those to the
77 nationwide EIA study, an adjusted TURN comparison would indicate there is a substantial risk
78 of *overrunning* SDG&E's proposed cost caps, given how expensive labor and other costs are in
79 the San Diego area when compared to the national average.

80 Second, used costs from a nationally-recognized engineering and procurement firm¹⁷ that
81 performed an actual bottoms-up analysis of each individual site (which included site visits) to
82 derive the cost estimates of the projects based on the project's size, location and required
83 microgrid specifications. Ballparking a cost cap estimate from a random national average
84 statistic based on non-comparable, generic situations is patently not as reliable as a cost estimate
85 performed by a nationally-recognized design firm for a specific project at a specific location.

¹⁵ U.S. Department of Labor, Occupational Employment Statistics Query System, Occupational Employment Statistics. Available at <https://data.bls.gov/oes/> (One occupation for multiple geographical areas->Construction Laborers>All Metropolitan Areas).

¹⁶ TURN (Confidential) 12, Confidential Table 2.

¹⁷ See, Burns & McDonnell, Industry Rankings. Available at <https://www.burnsmcd.com/about-us/industry-rankings>; BMcD was ranked #1 in 2018 for Power and #9 overall in the top 500 Design firms.

86 **IV. SDG&E’s MARKET STUDY IS A USEFUL INDICATOR OF POTENTIAL**
87 **BENEFITS**

88 TURN tried to quantify the GHG abatement cost in Dollars per Metric Ton based on the
89 total project costs and total emissions.¹⁸ TURN erred in its calculation as they did not include
90 the market revenues that offset the total costs of the system. Along those same lines ORA
91 calculated the Net Market Value (“NMV”) of these resources; however, ORA did not include a
92 way to verify these calculations. ORA claims that, “SDG&E’s projected market revenue
93 estimations are highly speculative,”¹⁹ yet ORA does not explain why they think it is speculative.
94 In fact, the cited projection is not mere speculation, but based on a robust study. SDG&E
95 commissioned a study from a well-respected third-party industry expert, Enovation Partners, to
96 model the potential market revenues.²⁰

97 Any modeled forecast of potential revenues is necessarily uncertain, that does not make it
98 “speculative.” My direct testimony described the study assumptions, using a proven energy
99 storage system (“ESS”) technology, with established cost information and market rules.²¹ ORA
100 does not attempt to show the study results are unreasonable. The forecasted revenues resulting
101 from the study are reasonable, especially given the context and purpose of the study. While the
102 study assumptions did not include any resiliency reservations, even if the ESS was removed from
103 the market for a limited amount of time, such resiliency reservations could be offset by the
104 conservative estimates as postulated by Enovations partners: “[r]elatively modest impact reflects

¹⁸ TURN (Confidential) 13, Confidential Figure 2.

¹⁹ ORA (Peterson, et al.) 4-5:12.

²⁰ Enovation Partners is a strategy and analytics consultancy focused entirely on the energy transition, with offices in Chicago, London, San Francisco, and Washington. SDG&E (Bierman) Appendix A.

²¹ SDG&E (Bierman) *passim*.

105 the conservative energy price forecasting approach adopted.”²² In any event, my direct
106 testimony held out the study results as illustrative, to show that substantial revenues could be
107 expected from project operation to offset against project costs.

108 ORA claims that, “[p]rocurement of technology other than Lithium-ion could result in
109 different results than indicated by Enovation, but SDG&E does not address this factor.”²³ ORA
110 is aware that lithium-ion is the leading energy storage technology at the moment, and to use any
111 other for a market study would not be reasonable.²⁴ SDG&E is confident it can procure an
112 energy storage system as modeled at the requested cost cap. It is possible that by letting all
113 technologies compete, the technology eventually selected has the potential to perform even better
114 than what was modeled by Enovation Partners. That means that any differences in the actual
115 system performance procured compared to those modeled by Enovation Partners would only add
116 value to customers.

117 ORA also mistakenly claims that, “the model assumes 0 capacity degradation for the first
118 10 years of operation.”²⁵ This is incorrect. Rather, SDG&E’s costs include a warranty that
119 guarantees 0 capacity degradation in the first 10 years. SDG&E clearly states the assumption
120 that the system will have a warranty to protect against degradation in the first 10 years, and then
121 will optimize the residual end of life of the system to maximize customer benefits. Again, this is
122 one of the design criteria where SDG&E prudently made trade-offs between a longer warranty

²² SDG&E (Bierman) Appendix, p. 2.

²³ ORA (Peterson, et al.) 4-6:8-10.

²⁴ That said, SDG&E is not limiting its procurement of energy storage solely to lithium-ion options. Rather, SDG&E has set up a competitive, technology neutral solicitation encouraging all qualifying energy storage technologies to participate and submit bids. SDG&E’s goal is to select the technology that meets the use case criteria and which represents the best value to its customers

²⁵ *Id.* at 4-6:11-12, *citing*, Bierman’s Direct Testimony (Corrected July 27, 2018), Appendix A, slide 27.

123 and longer life to maximize overall benefits and minimize overall costs. In the scope of the AB
124 2868 authorization, SDG&E did not think it was prudent to propose a longer life and a
125 consequently more expensive solution.²⁶ Given the unique requirements of AB 2868, and the
126 specific nature of these circuits, SDG&E believed it was more prudent to propose ESS projects
127 for this complicated use case to have a slightly lower lifespan and a lower total cost.

128 **V. THE PROPOSED PROJECTS MAXIMIZE BENEFITS AND MINIMIZE COSTS**

129 Intervenor submit conflicting testimony on how to minimize costs and maximize
130 benefits. For example, LS Power provides good advice, but its ask here contradicts its
131 suggestion, stating: the first rule of thumb of every designer of energy storage systems I've ever
132 worked with is that to be cost-effective, you should build the smallest physical battery that
133 achieves your primary goals and optimize it with software."²⁷ SDG&E concurs with that
134 statement. In fact, this was one of the guiding principles SDG&E used in deciding to employ
135 mostly one-hour duration batteries, or two-hour duration when it was prudent to do so. Again,
136 SDG&E could have proposed four-hour batteries, consistent with other regulations and state
137 policies, but instead took a measured approach and only put in the minimum required to enhance
138 reliability. This trade-off between one-hour and four-hours was a difficult issue but an example
139 of SDG&E prioritizing minimizing overall costs when additional benefits were not justified. On
140 the other hand, LS Power suggests that SDG&E purchase their entire 40 MW/40 MWh battery,
141 when there is clearly no need for the entire system. How can LS Power suggest SDG&E
142 minimize the design parameters, but then demand SDG&E's customers pay for LS Power's 40

²⁶ SDG&E has used longer-lived batteries in the appropriate context. For example, the energy storage devices approved in the 2016 preferred resources LCR RFO had lifespans out to 30 years in order to minimize costs. These projects were approved by D.18-05-024.

²⁷ LS Power 9:19-22.

143 MW project instead of the proposed 20 MW? LS Power's suggestion would at least double the
144 costs to customers for that circuit and potentially much more.

145 **VI. CONCLUSION**

146 SDG&E is committed to provide the cleanest, safest, and most reliable electricity to its
147 customers. SDG&E has prudently balanced the goals and objectives of AB 2868 and to
148 maximize benefits and minimizing costs for ratepayers. SDG&E supports continued discussion
149 of cost-effectiveness in other proceedings such as the IRP and will continue to be a partner to the
150 state and its customers in reducing GHG emissions in California.

151 I have previously submitted direct testimony in this proceeding, which included my
152 qualifications. This concludes my prepared rebuttal testimony.

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

**DECLARATION OF TED REGULY
REGARDING CONFIDENTIALITY OF CERTAIN DATA/DOCUMENTS
PURSUANT TO D.17-09-023**

I, Ted Reguly, do declare as follows:

1. I am Director in the Growth & Technology Integration Department for San Diego Gas & Electric Company (“SDG&E”). I have been delegated authority to sign this declaration by Caroline Winn, Chief Operating Officer. I have reviewed the confidential information included within the Rebuttal Testimony of Evan Bierman submitted concurrently herewith (the “Rebuttal Testimony”). I am personally familiar with the facts in this Declaration and, if called upon to testify, I could and would testify to the following based upon my personal knowledge and/or information and belief.

2. I hereby provide this Declaration in accordance with Decision (“D.”) 17-09-023 and General Order (“GO”) 66-D to demonstrate that the confidential information (“Protected Information”) provided in the Rebuttal Testimony is within the scope of data protected as confidential under applicable law.

3. In accordance with the narrative justification described in Attachment A, the Protected Information should be protected from public disclosure.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge.

Executed this 24th day of August, 2018, at San Diego.



Ted Reguly
Director – Growth & Technology Integration

ATTACHMENT A

SDG&E Request for Confidentiality on the following information in its Rebuttal Testimony

Location of Protected Information	Legal Citations	Narrative Justification
<p>Highlighted data within documents:</p> <p>Rebuttal Testimony of Evan Bierman, EB-5, Lines 73-75.</p>	<p>CPRA Exemption, Gov't Code § 6254.7(d)</p> <p>CPRA Exemption, Gov't Code § 6254(k)</p> <ul style="list-style-type: none"> • Cal. Evid. Code § 1060 • Cal. Civil Code §§ 3426 <i>et seq.</i> 	<p>The Protected Information is entitled to confidential treatment under applicable law, including, but not limited to, the legal authority cited herein. The identified confidential information are project cost estimates which third-party vendors will bid upon based upon an RFI/RFP process. Public disclosure would pose potential negative impacts and/or competitive harm by setting a cost target for third parties. Cost estimates should not be made visible to the public, other vendors, contractors, or any others outside SDG&E, as public disclosure would impact competitive pricing, and the ability to secure optimal terms with third parties.</p>