



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

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Second Application of Pacific Gas and
Electric Company for Approval of
Agreements Resulting from Its 2014-2015
Energy Storage Solicitation and Related
Cost Recovery (U39E)

A.16-04-024
(Filed April 29, 2016)

OPENING BRIEF OF STEM, INC.

DAVID L. HUARD
BETH A. FOX
LILLY B. MCKENNA
Manatt, Phelps & Phillips, LLP
One Embarcadero Center, 30th Floor
San Francisco, CA 94111
Telephone: (415) 291-7400
Facsimile: (415) 291-7474
Email: DHuard@manatt.com,
BFox@manatt.com,
LMcKenna@manatt.com

Attorneys for Stem, Inc.

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I. INTRODUCTION

Pursuant to California Public Utilities Commission (“Commission”) Rules of Practice and Procedure, Rule 13.11, and in accordance with the *Scoping Memo And Ruling Of Assigned Commissioner And Administrative Law Judge* dated July 25, 2016 (“Scoping Memo”)¹, Stem, Inc., dba Stem Energy Northern California, LLC (“Stem”) hereby submits its Opening Brief in the above-referenced proceeding pertaining to the *Second Application of Pacific Gas and Electric Company (U 39 E)* (“PG&E”) for Approval of Agreements Resulting from its 2014-2015 Energy Storage Solicitation and Related Cost Recovery, filed April 29, 2016 (“Application”).

II. SUMMARY OF POSITION

The record in this matter conclusively demonstrates that the agreement between PG&E and Stem (“Agreement”) to provide four (4) MW of behind-the-meter (“BTM”) storage for resource adequacy (“RA”) and flexible RA provides great value to PG&E’s customers and the State. It contains an innovative pricing mechanism that encourages the project to more actively participate in the California Independent System Operator (“CAISO”) markets, thus providing higher value RA for California ratepayers. In this sense, it is a better—far better—source of RA than traditional demand response programs, which are beset with non-performance

¹ Scoping Memo, p. 8.

events and which may be less available due to the likely prohibition on back-up generators. The Agreement's near-term online date and relatively short term provide the perfect vehicle to prove the benefits of the type of pricing structure that is a feature of the Agreement.

Approval of the Agreement also aligns well with the Commission's long history of encouraging new industries and ensuring diversity among projects. As explained below, the contentions of the Office of Ratepayer Advocates ("ORA") that the Agreement is not "cost-effective" or that an experimental program would somehow better suit the project are unavailing—under a proper understanding of cost-effectiveness, this project qualifies, and there is no appropriate experimental program for providing RA and flexible RA to PG&E or learning the commercial benefits of the cost mechanism. Expeditious approval of the Agreement will bring valuable benefits to PG&E, its customers and the State.

III. BACKGROUND

A. The Commission's Efforts to Advance State Policy

From restructuring its electric utilities in the late 1990s, through the efforts to create a market for clean, renewable generation, California has been a leader in transforming the energy industry. Assembly Bill ("AB") 2514 was no exception: it put the State firmly on the path of expanding the use of energy storage systems, which the Legislature recognized had a wide array of benefits, and directed the Commission to determine appropriate targets for their procurement. As Commissioner Peterman stated in an Assigned Commissioner's Ruling presenting a proposal for the planning, procurement and evaluation of energy storage systems:

Energy storage has the potential to transform how the California electric system is conceived, designed, and operated. In so doing, energy storage has the potential to offer services needed as California seeks to maximize the value of its generation and transmission investments: optimizing the grid to avoid or defer investments in new fossil-power plants, integrating renewable power, and minimizing greenhouse emissions.²

² R.10-12-007, *Assigned Commissioner's Ruling Proposing Storage Procurement Targets and Mechanisms and Noticing All-Party Meeting*, filed June 10, 2013 ("ACR"), p. 2.

The ACR noted, however, that a long list of market barriers exist that hinder the adoptions of energy storage technologies, many of which “will only diminish through a procurement process in which certain data, such as cost-effectiveness, operational data, and greenhouse gas impacts, are specifically solicited and evaluated.”³ Commissioner Peterman recognized that the barriers faced by “storage applications and technologies that have not yet achieved widespread commercial operation” are particularly significant, and noted that she was, “. . . proposing a set of procurement targets that will allow this learning to occur for policy makers and industry participants alike.”⁴

The Commission ultimately adopted an energy storage procurement framework in the *Decision Adopting Energy Storage Procurement Framework and Design Program*.⁵ The ES Decision not only established specific energy storage targets for investor-owned utilities (“IOUs”), but it created “buckets” for three different types of storage applications: transmission-connected, distribution-connected and customer-side (otherwise referred to as “BTM”) applications.⁶ In its discussion on the creation of buckets, the ES Decision stated, “We agree with the CAISO that we should view the use-case buckets in a manner that develops market participation.”⁷

³ R.10-12-007, ACR, p. 4. Indeed, in enacting AB 2514 the Legislature also noted that energy storage of all kinds faced “significant barriers”: “(f) There are significant barriers to obtaining the benefits of energy storage systems, including inadequate evaluation of the use of energy storage to integrate renewable energy resources into the transmission and distribution grid through long-term electricity resource planning, lack of recognition of technological and marketplace advancements, and inadequate statutory and regulatory support.” Assem. Bill No. 2514 (2010 Reg. Sess.) § 1 (f).

⁴ R.10-12-007, ACR, p. 4.

⁵ D.13-10-040, *Order Instituting Rulemaking Pursuant to Assembly Bill 2514 to Consider the Adoption of Procurement Targets for Viable and Cost-Effective Energy Storage Systems*, dated October 17, 2013 (“D.13-10-040”, or “ES Decision”).

⁶ D.13-10-040, p. 11.

⁷ D.13-10-040, p. 12.

The ES Decision also authorized all three IOUs to conduct 2014 Energy Storage (“ES”) Request for Offers (“RFOs”) and procure to the adopted targets.⁸ While PG&E’s overall multi-year storage target is 580.4 megawatts (“MW”), its target for customer-side projects is 85 MW.

On December 1, 2015, PG&E filed its first application in connection with its 2014 ES RFO, initially seeking approval of seven agreements, representing a total of 75 MW of energy storage capacity.⁹ Of the six PG&E contracts ultimately presented to the Commission, none were for customer-side resources. Three were transmission-connected Energy Storage Agreements; one was a distribution-connected Energy Storage Agreement; and two were “Purchase and Sale Agreements,” (“PSAs”).

The PSAs were agreements by which third-party developers would construct energy storage facilities to PG&E’s specification for ultimate ownership by PG&E, and they were intended to allow PG&E to defer costly substation upgrades. In a Decision recently voted in at the September 15, 2016 Commission Meeting, the Commission rejected the PSAs, not only because they were not cost-effective or competitive, but because they failed to ensure reliable service in their distribution deferral function.¹⁰ Indeed, as the Decision notes, the Office of Ratepayer Advocates (“ORA”) argued that the transformers at the two locations would become overloaded prior to the commercial operation date of the PSAs, thus markedly diminishing their value.¹¹

⁸ D.13-10-040, Ordering ¶¶ 1-3, pp. 76-77, Appendix A.

⁹ A.15-12-004, *Application of Pacific Gas and Electric Company (U 39 E) for Approval of Agreements Resulting From Its 2014-2015 Energy Storage Solicitation and Related Cost Recovery*, filed December 1, 2015 (“Application”), p. 5. In its opening brief, PG&E notified the Commission that it had terminated one of the contracts it had submitted for approval. With that change, PG&E then sought approval of four energy storage agreements and two purchase and sale agreements for a total of 72 MW. A.15-12-004, *Pacific Gas and Electric Company’s (U 39 E) Opening Brief*, p. 3, Attachment A.

¹⁰ D.16-09-004, *Application of Southern California Edison Company (U338E) for Approval of Contracts Resulting From Its 2014 Energy Storage Request for Offers (ES RFO)*, dated September 15, 2016 (“D.16-09-004”), p. 13.

¹¹ D.16-09-004, pp. 12-13.

In its application, PG&E also requested authorization to submit additional BTM agreements to the Commission for approval in the future if its then-ongoing negotiations, which arose out of the 2014 ES RFO but had not yet concluded, ultimately reached a successful conclusion.¹² Once PG&E and Stem negotiated their contract for energy storage services (“the Agreement”), PG&E filed the instant application seeking approval of the Agreement.

B. The Agreement

The Agreement between PG&E and Stem is truly innovative, in many different ways. Among other things, it provides a new solution for energy storage procurement and a more cost-effective form of BTM resource adequacy. In a nutshell, it is an agreement with a five-year term. During the term of the agreement, Stem will obtain charging energy for the project through the customers’ retail meters, store the energy in the project, and deliver the energy for on-site load reduction at customer facilities.¹³ Stem will not be allowed to export energy back to the grid.

The Project will provide PG&E with four (4) MW of RA and flexible RA on a monthly basis, making use of an aggregation of BTM storage devices.¹⁴ Stem is entirely responsible for aggregating customers in PG&E’s service territory and developing, installing, and operating the energy storage systems at each customer site. Stem will aggregate a fleet of distributed storage for participation in the CAISO wholesale energy markets as a Proxy Demand Resource (“PDR”). With this participation, Stem’s storage counts towards PG&E’s RA requirements in a manner similar to demand response (“DR”) resources in the Demand Response Auction Mechanism (“DRAM”).¹⁵ As explained below, the Agreement provides great value to

¹² A.15-12-004, Application, pp. 1, 8.

¹³ Application, p. 5.

¹⁴ *Id.*

¹⁵ Exh. PG&E-1, *PG&E’s Results of 2014 Energy Storage Solicitation Second Prepared Testimony (Public Version)*, dated April 29, 2016 (“Prepared Testimony”), pp. 3-1 – 3-2.

PG&E's customers and a real demonstration of how storage can be used in lieu of traditional demand response projects to reduce demand on the grid.

IV. ARGUMENT

A. The Agreement Provides Great Value to PG&E's Customers and to the State

1. The Agreement Provides RA Superior to that of Traditional Demand Response Products

The Agreement is the only BTM agreement signed by PG&E through its ES program and the only one that provides RA related to customer load reduction.¹⁶ The Commission ordered the IOUs to procure from three separate buckets for good reason: even though transmission or distribution-connected projects might sometimes appear to be less expensive, customer-connected energy storage projects are capable of providing equal grid value such as RA *in addition to* providing benefits to customers.

The first innovation is in the terms of the Agreement, which incentivize the Project to provide more value than traditional demand response or RA resources. There are significant concerns with traditional demand response programs. For example, not all customers respond when called upon. Non-performance events are expensive for ratepayers: utilities call on demand response customers when power is short and prices are high, but that is often the time that customers themselves value energy the most. If demand response customers fail to perform, the utilities are required to quickly procure replacement resources at high spot prices. Compared to demand response and even some generators, storage-based RA is more reliable because customers can provide demand reduction without impacting their building operations.

Additionally, many demand response participants, in order to comply with curtailment orders, tend to rely on back-up generators or "BUGs."¹⁷ Because BUGs are stationary fossil-fueled (often diesel-fueled) generators and they are located closer to the load

¹⁶ Exh. PG&E-1, Prepared Testimony, p. 3-1.

¹⁷ D.05-01-056, *Order Instituting Rulemaking on Policies and Practices for Advanced Metering, Demand Response, and Dynamic Pricing*, dated January 27, 2015, pp. 46-49.

than traditional power plants, they have a significant impact on air pollution. Demand response participants were paid to provide carbon-free load reduction, but their use of BUGs undermined that worthy goal.

A recent Proposed Decision,¹⁸ if adopted by the Commission, will prohibit customers receiving demand response incentives from using most BUGs for load reduction after January 1, 2018.¹⁹ The prohibition against BUGs will almost certainly reduce the number of customers and amount of load participating in demand response programs, at least in the near term. It is thus all the more critical for the Commission to approve near-term BTM energy storage projects, which provide customer load reduction without the associated pollution, while providing the utility with the RA it has contracted for. The near-term Expected Initial Delivery Date of the Stem Project, September 1, 2017, dovetails well with the prohibition on BUGs and enables it to provide customer load reduction when other projects may no longer be able to.

As ORA has stated in the context of demand response, “Increasing DR that actually performs and is cost-effective should be the Commission’s top priority.”²⁰ BTM energy storage is the right answer. It is dependable, clean and reliable. It satisfies the CAISO preference for a 20-minute response time requirement for “supply side” DR integrated into the CAISO market.²¹ This project, which PG&E selected from all the other BTM energy storage offers on its expanded shortlist,²² clearly provided the best value for PG&E’s needs, and is the ideal project to demonstrate how clean BTM storage can benefit California ratepayers.

¹⁸ R.13-09-011, *Proposed Decision of ALJ Hymes*, mailed August 30, 2016. As of this writing, the Proposed Decision is listed on the Commission’s September 29, 2016, Agenda.

¹⁹ *Id.* at p. 86, Order ¶ 3.

²⁰ R.13-09-011, *Comments of The Office of Ratepayer Advocates*, filed July 1, 2016, p. 7.

²¹ *See, e.g.*, R. 14-10-010, *California Independent System Operator Corporation Reply Comments*, filed June 14, 2016.

²² Exh. PG&E-1, Prepared Testimony, pp. 2-6–2-9.

2. The Agreement Provides Incentives for Load Reduction and a Valuable Cost Reduction Feature

Second, the Agreement has a very unique—perhaps, first of its kind—pricing mechanism that both encourages Stem to provide the full complement of capacity while retaining cost protection for PG&E customers. PG&E will pay Seller a Monthly Payment that is comprised of a monthly Capacity Payment less a monthly Energy Settlement amount.²³ The Energy Settlement amount is the sum of the four highest hourly day-ahead energy prices, less a set Variable Operations & Maintenance (“VOM”) cost, summed over all days in the month.²⁴ If the applicable hourly day-ahead price is less than the VOM, the Energy Settlement amount for that hour is zero.²⁵ The Energy Settlement amount is intended to represent a possible (not actual) monthly load reduction amount that Seller may receive in the CAISO market.²⁶ Seller must bid the project into the CAISO market, but Seller makes all bidding decisions for the project, not PG&E. Thus, Stem has every incentive to bid the project as often as possible, at prices low enough to clear, to ensure that it obtains the highest prices from the RA market that will enable it to earn back the savings it provided to PG&E customers.

The Energy Settlement subtractor mechanism adds another benefit: because it pushes the resource to participate more frequently, at prices lower than the typical clearing price in the wholesale market, the resource will reduce the wholesale energy clearing price for everyone. When demand is highest and the slope of energy prices is steepest, even a small reduction in energy usage can lead to a dramatic reduction in prices at affected nodes. In short, the contract payment mechanism is designed to provide the maximum load reduction possible. To the extent that the Agreement demonstrates the beneficial effects of this mechanism, the Commission should consider adopting similar mechanisms for RA contracts going forward. At

²³ Exh. PG&E-1, Prepared Testimony, p. 3-3.

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

scale, this impact on the wholesale market clearing prices would translate into millions of dollars in savings for ratepayers.

3. Near-term Initial Delivery Date

The third benefit of the Agreement is its very-near-term initial delivery date: The Initial Delivery Date, which will start the delivery term under the Agreement, can be as early as June 1, 2017, but no later than the Expected Initial Delivery Date (September 1, 2017), provided that CPUC Approval and all other conditions precedent to the Initial Delivery Date have been met.²⁷ Because the Initial Delivery Date is less than a year away, PG&E’s customers will reap the benefits of this agreement sooner.

4. Short—But Not Too Short—Term

The term of this agreement, five years, is the shortest of all agreements executed through this RFO. (The other agreements have terms ranging from 10 to 20 years.) The term is long enough to gain operational and market information regarding the performance, efficiency, operations, maintenance and uses of energy storage in this manner. It is short enough, however, that PG&E’s customers are not locked into a long-term agreement if lower-cost alternatives to provide the same service arise. As the Independent Expert (“IE”) stated, “The project offers an accelerated opportunity for PG&E to gain knowledge of how BTM resources will be co-optimized to serve the needs of their retail customers and the CAISO Energy markets.”²⁸

5. The Project is Viable

Finally, the project has, as the IE stated, “a reasonable probability of success”²⁹ because “[t]he project is being developed by an experienced project developer with access to necessary capital and with a successful track record of bringing dispatchable BTM project to

²⁷ Exh. PG&E-1, Prepared Testimony, p. 3-2.

²⁸ Exh. PG&E-1, Prepared Testimony, Appendix C, p. C-57.

²⁹ *Id.*

fruition.”³⁰ As the IE explained, the Stem team is experienced in enrolling customers, siting, permitting, interconnecting, procuring, installing, financing and commercial operation of BTM energy storage facilities.³¹ Stem has over 1.5 million hours of storage equipment run time since 2013, over 170 installations, and over \$350 million in committed project finance capital to date.³²

Although ORA criticizes the viability of the Project³³ because Stem would have to “potentially double its installations across the state,” ORA ignores the fact that Stem presently has more than 68 MWh of systems operating and under contract³⁴ and will have considerably more soon, as Stem has a contract with Southern California Edison to supply it with 85 MW of aggregated BTM storage.³⁵ This Project’s additional 16 MWh, which Stem estimates would require well under 100 new sites, is not a risky proposition or one that limits the viability of the Project. ORA cannot point to a single company that has more successful installations and operating experience in BTM storage in California than Stem, because there isn’t one. If anything, project viability is a qualitative criterion in Stem’s favor.

B. The Commission Has Long Led the Way in Enabling New Industries to Flourish to Meet State Goals

While the Legislature and the Commission have taken enormous steps toward the creation of an energy storage market—opening up the storage mandate to almost every kind of energy-storage technology and point of interconnection—the market is still in its infancy. The

³⁰ *Id.*

³¹ Exh. PG&E-1, Prepared Testimony, p. 3-4.

³² *Id.*

³³ *Protest of The Office of Ratepayer Advocates (Public Version)*, filed June 2, 2016 (“ORA Protest”), pp. 10-12.

³⁴ See <<http://www.stem.com/stem-expands-portfolio-to-68-mwh-closes-15mm-investment-from-mithril/>> (as of September 19, 2016).

³⁵ See <<http://www.greentechmedia.com/articles/read/Stem-Wins-Big-With-85-MW-of-Energy-Storage-in-SCE-Procurement>> (as of September 19, 2016).

2014 RFOs conducted by the IOUs were the first energy storage-only solicitations in California. As with any developing market or product, prices may initially appear high—but only because the technology is new and the developers are taking the risk of success. Fortunately, the State has been down this road before, and the lessons from comparable industry development are directly translatable to the energy storage program.

In 2002, California established its Renewables Portfolio Standard (“RPS”) Program, which initially required 20 percent of retail sales to be procured from renewable energy by 2017. This goal, seen as quite ambitious at the time, was followed by additional legislation and Executive Orders that added even more aggressive RPS procurement targets. In the dawn of the renewable energy era, the market was not nearly as developed as it is today. Indeed, the Commission noted in one Resolution that prices had become so high that state above-market funds (“AMF”) were insufficient to cover the price differential. As the Commission stated in a 2009 resolution:

The prices bid into RPS solicitations have risen consistently since 2002, and although the MPR has risen as well, the utilities are having difficulty filling their RPS procurement needs with viable, “least cost, best fit” projects, without exceeding their respective AMF allocations.³⁶

As we all know, however, as the market matured renewable prices dropped significantly, as technological innovation and the economics of scale worked in tandem to suppress costs.

Likewise, the Commission initially created the Solar Photovoltaic Program (“SPVP”) in 2009 to encourage the development of small solar generation, primarily on

³⁶ Resolution E-4240, *Pacific Gas & Electric Company (PG&E) Requests Approval of a Power Purchase Agreement (PPA) for Generation From a New Solar Photovoltaic Facility Owned by El Dorado Energy, LLC*, dated May 21, 2009, p. 12.

rooftops.³⁷ The initial authorized price cap for SPVP was \$260/MWh³⁸—a price that was not only far above that of conventional generation, but above that of other renewable generation as well. As the Commission noted just four years later, however, the program achieved significant benefits and dramatic price reduction:

The SPVP has achieved significant success in meeting its programmatic goals, playing an important role in the transformation of the Solar PV market. Since its inception, thousands of MWs of Solar PV has been installed on both the customer and utility side of the meter, with an even larger amount contracted for and slated to come online over the next few years. A technology that was initially considered far too expensive to be a significant part of the IOUs' RPS portfolios has achieved a marked reduction in price that now allows it to effectively compete in the renewable energy procurement market.³⁹

Had the Commission not implemented SPVP, or had it directed that the price of small solar projects be compared with larger renewable, or even gas- or coal-fired projects, the rooftop solar industry would very likely not have blossomed as it has.

Energy storage is today at the point that renewable power was a decade ago. As with renewable power, it makes no sense to focus only on cost—particularly where, as here, a project is small (4 MW), has a high viability, is of a relatively-short term (but long enough to actually prove that its contractual attributes are beneficial), provides unique benefits and is an excellent opportunity to learn how storage can effectively replace traditional demand response products. Indeed, this is precisely the type of project that the Commission should approve, as it is replicable and will lay the groundwork for many BTM storage projects to come.

³⁷ D.09-06-049, *Application of Southern California Edison Company (U338E) for Authority to Implement and Recover in Rates the Cost of its Proposed Solar Photovoltaic (PV) Program*, 2009 Cal. PUC LEXIS 297 (“D.09-06-049, 2009 Cal. PUC LEXIS 297”), **1-2.

³⁸ D.09-06-049, 2009 Cal. PUC LEXIS 297, *46.

³⁹ D.13-05-033, *Application of Southern California Edison Company (U338E) for Authority to Implement and Recover in Rates the Cost of its Proposed Solar Photovoltaic (PV) Program*, dated May 23, 2013, pp. 8-9.

As Commissioner Peterman noted, “many of [the barriers facing energy storage projects] are substantially similar to those faced by the rooftop solar photovoltaic industry when this Commission first designed the California Solar Initiative (CSI) program during the middle of the last decade.”⁴⁰ As with rooftop solar, it is important to approve contracts and get projects into development, so that the market can expand and customers can see the results. Approving this Agreement is an important step forward that will support the development of similar customer-side storage projects.

C. Cost-Effectiveness Cannot be Viewed Narrowly

The gravamen of ORA’s complaint about the Agreement is that it is not “cost effective.”⁴¹ As PG&E correctly noted, however, “there is a cost tradeoff to executing agreements for projects with greater levels of diversity”⁴² and “PG&E made a cost/benefit tradeoff in order to consider other qualitative factors when evaluating potential storage projects.”⁴³ PG&E further stated that, “Additionally, as with renewable technologies, PG&E expects the costs of energy storage to decline over time and performance to improve.”⁴⁴ It is critical to test new and different types of products to learn how they can be used to further the State’s goals of reducing peak energy demand and contributing to reliability.

PG&E is correct: the Commission has long recognized the need for IOUs to have a diverse range of products in their portfolios and has never viewed cost-effectiveness in a vacuum, without considering the factors of diversity and viability. For example, in approving a

⁴⁰ R.10-12-007, ACR, p. 4.

⁴¹ ORA Protest, pp. 4-11.

⁴² *Reply of Pacific Gas and Electric Company (U 39 E) to Response and Protests*, filed June 10, 2016 (“PG&E Reply to Protests”), p. 3.

⁴³ PG&E Reply to Protests, p. 3.

⁴⁴ Exh. PG&E-1, Prepared Testimony, p. 3-6.

geothermal project for SCE which was considered to be of “moderate to high cost,” the Commission stated:

Although the Geysers PPA has a low to moderate net market value and moderate to high cost, the PPA fits SCE’s needs, as stated in SCE’s 2014 RPS Procurement Plan. Specifically, the Geysers facilities are already operational which negates any viability risk. Additionally, the geothermal generation that SCE is purchasing under the Geysers PPA would allow SCE to diversify their existing RPS portfolio which is comprised of mostly wind and solar resources. Lastly, the Geysers PPA has favorable terms, e.g., online date and generation quantities, that meet all of the requirements that SCE stated in their 2014 RPS Procurement Plan.⁴⁵

Energy Storage is no exception to this rule: in adopting the Energy Storage paradigm and explaining the definition of “energy storage system” as it is used in the Public Utilities Code the Commission said, “This definition is intended to embrace a mix of ownership models and contribute to a diverse portfolio that can encourage competition, innovation, partnerships, and affordability.”⁴⁶

This Agreement is indeed “cost-effective” under a more appropriate definition of cost-effectiveness. The determination of whether a project like this is “cost effective” depends on much more than the “sticker price” of the Agreement – the type of storage provided under the Agreement and all the short and long-term benefits to ratepayers should be considered. This Agreement cannot fairly be compared with transmission- or distribution-connected projects, which have different attributes and provide different benefits. Similarly, it cannot be compared with BTM projects that do not have the special performance incentives in this agreement. Ignoring the enormous benefits that this Project brings over other BTM projects is mistaken and

⁴⁵ Resolution 4747, *Approves Southern California Edison Company’s (SCE’s) Request to Enter Into a Renewables Portfolio Standard (RPS) Power Purchase Agreement with Geysers Power Company, LLC*, dated May 26, 2016, p. 7.

⁴⁶ D.13-10-040, p. 51.

would be akin to comparing a home with a brand new kitchen to a same-size home with a kitchen from the 1940s.

D. Experimental Programs Are Not A Substitute

ORA contends that because a primary basis for approval of the project is the learning experience it provides, PG&E should obtain the project or one like it through the Electric Program Investment Charge (“EPIC”) program or another research and development program.⁴⁷ ORA’s argument misses the mark: while the project provides valuable commercial learning experiences, it is primarily designed to provide resource adequacy and (through incentives) bid into the CAISO to reduce load. That is, the Project is a commercial project with real world benefits. It is unclear which, if any, research and development program would support a project like this one.

Commercial contracts like the Agreement and demonstration projects have fundamentally different objectives, and so do the programs supporting them. Programs like EPIC are primarily “technology demonstration” projects with the intent of testing whether a technology is able to technically and physically provide the desired function.⁴⁸ The ES RFO and this Agreement are not testing technology—the advantages of battery storage are well-known—but are experimenting with new commercial business models using commercially available, proven technology.

In fact, the only program cited by ORA was EPIC, and the Commission applied the bulk of its funding to the categories of “Applied research and development” and “Technology demonstration.”⁴⁹ It provided a relatively small amount of funding to “Market Facilitation,” defined as market research, program tracking, education and outreach, regulatory

⁴⁷ ORA Protest, p. 9.

⁴⁸ D.12-05-037, *Order Instituting Rulemaking on the Commission's own motion to determine the impact on public benefits associated with the expiration of ratepayer charges pursuant to Public Utilities Code Section 399.8*, dated May 24, 2012 (“D.12-05-037”), p. 2.

⁴⁹ D.12-05-037, p. 7.

assistance/streamlining, and workforce development—none of which are applicable here.⁵⁰ It allocated no funding at all to “Market support programs,” which it defined as programs that seek to enhance the competitive position of certain preferred, commercially-proven technologies or approaches relative to incumbent technologies or approaches.⁵¹

The duration and expected outcome of a demonstration project also differ from a commercial project. Because demonstration projects are designed to test technology, they are generally not intended to last more than a year or two and the result is usually a technical feasibility report.⁵² The technology deployed in demonstration projects is not necessarily intended to stay in place after the functional demonstration is complete.⁵³ By contrast, commercial contracts must have a longer term in order to obtain financing and the installations are expected to last as long as is commercially reasonable. The result of such contracts is the delivery of real service to the grid, and the education is in commercial feasibility, not technical feasibility. EPIC projects cannot commit to grid services like Resource Adequacy because they cannot guarantee they will still be around.

Finally, while EPIC projects may test operational models, they do not demonstrate value to be gained from specific provisions of commercial contracts. By contrast, the education that will come from this Agreement is that of a business model. Real world operational lessons are far more valuable than technology demonstrations for already commercialized technology. Since behind-the-meter storage technologies such as Stem’s are

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² See D.92251, *PG&E Co., SDG&E Co., So Cal Edison Co. and SoCal Gas Co. Ordered to Implement Demonstration Solar Financing Programs and Authorized to Incur Expenses of \$500,000 for Pre-Program Preparatory Work*, 1980 Cal. PUC LEXIS 1189 (“D.92251, 1980 Cal. PUC LEXIS 1189”), *13.

⁵³ See D.92251, 1980 Cal. PUC LEXIS 1189, **13-14.

already commercially viable and operationally tested, the ratepayers are better served by finding the best business models that will work.

ORA queried PG&E about a specific EPIC project, Project No. 2.19 and asked why that project and the Stem Agreement “are not duplicative efforts.”⁵⁴ As PG&E thoroughly explained, there are substantial differences in scope, deliverables and proposed metrics of evaluating performance.⁵⁵ Among other things, the Agreement provides RA benefits in the wholesale markets, while the EPIC project provides benefits to the distribution system, and both the deliverables and the metrics to assess each project are entirely different.⁵⁶

As explained above, a better design of future procurement processes and contracts is well worth the higher cost for such a small contract.

E. If The Agreement is Not Approved, PG&E will Fall Short of Meeting Its 2014 Energy Storage Goal

If the Stem Contract is not approved, PG&E will fall short of meeting its 2014 energy storage goal.⁵⁷ This procurement goal was established by the Commission under legislative directive pursuant to AB 2514. PG&E should not be obstructed from meeting this goal, particularly where the Agreement offers significant customer benefits, and it is not clear how PG&E could or should remedy its ES procurement target shortfall at this late point in time.

F. This Application Should Be Decided on an Expedited Basis

As already noted, the Initial Delivery Date of the Project is less than a year away—it can be as early as June 1, 2017, but no later than the Expected Initial Delivery Date (September 1, 2017).⁵⁸ Stem is entirely responsible for aggregating customers in PG&E’s service

⁵⁴ See Exh. ORA-2, *PG&E Responses to ORA Data Request No. ORA-A.16-04-024-PG&E03*, dated September 12, 2016, Questions and Answers 1-4.

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ Exh. PG&E-1, Prepared Testimony, p. 1-3.

⁵⁸ Assuming that CPUC Approval and all other conditions precedent to the Initial Delivery Date have been met. Exh. PG&E-1, Prepared Testimony, p. 3-2.

territory and developing, installing, and operating the energy storage systems at each customer site. In order for Stem to have sufficient time to develop the project, reach out to interested customers and install the energy storage devices in their facilities prior to the Expected Initial Delivery Date, this Agreement must be approved by the end of the year.

V. CONCLUSION

For the foregoing reasons, Stem respectfully requests that the Commission issue a decision in this proceeding that approves the Agreement. Stem also requests that the Commission issue a decision expeditiously, but no later than December 15, 2016, so that it may effectively carry out its obligations under the Agreement.

Dated: September 23, 2016

By: /s/ Beth A. Fox
Beth A. Fox

DAVID L. HUARD
BETH A. FOX
LILLY B. MCKENNA
Manatt, Phelps & Phillips, LLP
One Embarcadero Center, 30th Floor
San Francisco, CA 94111
Telephone: (415) 291-7400
Facsimile: (415) 291-7474
Email: Dhuard@manatt.com,
BFox@manatt.com,
LMcKenna@manatt.com

Attorneys for Stem, Inc.