

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

ENERGY DIVISION

AGENDA ID: 16868
RESOLUTION E-4949
October 25, 2018

REDACTED RESOLUTION

Resolution E-4949. Pacific Gas and Electric request approval of four energy storage facilities with the following counterparties: mNOC, Dynegy, Hummingbird Energy Storage, LLC, and Tesla.

PROPOSED OUTCOME:

- This Resolution approves cost recovery for three power purchase agreements and one engineering, procurement and construction (EPC) agreement for four energy storage facilities with the following counterparties: mNOC, Dynegy, Hummingbird Energy Storage, LLC, and Tesla.
- This Resolution finds that the Moss Landing Energy Storage project does not require a CPCN or permit to be issued from the Commission.

SAFETY CONSIDERATIONS:

- Each power purchase agreement includes Section 11, which contains detailed safety provisions, including the requirement for a safety plan. The EPC agreement for the Moss Landing project also contains detailed safety provisions.

ESTIMATED COST:

- The total costs are confidential at this time.

By Advice Letter 5322-E, Filed on June 29, 2018.

SUMMARY

Pacific Gas and Electric's (PG&E's) energy storage power purchase agreements (PPAs) with mNOC, Dynegy, and Hummingbird Energy Storage, LLC, and engineering, procurement and construction (EPC) agreement with Tesla, are compliant with the intent of Commission Resolution E-4909 and the Energy Storage Procurement Framework and Design Program, and are approved without modification.

PG&E filed Advice Letter 5322-E on June 29, 2018, requesting California Public Utilities Commission (Commission) approval of three capacity contracts and one purchase agreement, for four projects totaling 567.5 megawatts (MWs) in capacity.

These four projects resulted from a solicitation authorized by Commission Resolution E-4909, launched by PG&E on February 28, 2018. Pursuant to the capacity agreements, PG&E will purchase all capacity attributes from the Hummingbird Energy Storage LLC, mNOC, and Dynegy energy storage projects. Pursuant to the engineering, procurement and construction (EPC) agreement with Tesla, PG&E will own the energy storage project.

This Resolution approves these four agreements. PG&E's execution of the agreements is consistent with the objectives and directives of Commission Resolution E-4909, as well as the Energy Storage Procurement Framework and Design Program, approved by the Commission in Decision (D.) 13-10-040.

Resolution E-4909 was issued with market power concerns at front of mind, and was specific to the three plants in question at the time – Yuba City, Feather River and Metcalf Energy Centers – and the capacity or voltage issues in their respective subareas that their retirement would create. The Commission continues to be concerned that the contracting position of the majority of the gas fired resources serving the South Bay – Moss Landing subarea, and potential retirement of the Gilroy Cogen plant, and a projected increased reliability need in the subarea, together create the conditions for future exercise of market power in the subarea. This potentiality is

significantly reduced with the long-term procurement of capacity to replace the need to continue with short term contracts for gas-fired capacity, as represented by AL 5322-E. Thus, as discussed in more detail later in this Resolution, the original direction of Resolution E-4909 applies, and the Advice Letter and Resolution process remains appropriate for the procurement represented by AL 5322-E.

The agreements are reasonably priced and the related costs to PG&E are fully recoverable in rates over the life of the PPA. PG&E requests that costs for these agreements be recovered via the Cost Allocation Mechanism (CAM), as authorized by Commission Resolution E-4909.¹ This Resolution approves that request for the three third party owned contracts and requires PG&E to file an Application requesting cost recovery for its proposed utility owned project.

Table 1, below, provides a summary of the four projects.

Table 1.

<i>Developer</i>	<i>Size (MWs)</i>	<i>Grid Domain</i>	<i>Technology</i>	<i>Location</i>	<i>Duration (hours)</i>	<i>Contract Type</i>	<i>Duration (years)</i>	<i>COD</i>
Dynergy	300	T	LiOn battery	Moss Landing	4	RA capacity-only	20	12/1/20
Humming bird Energy Storage, LLC	75	T	LiOn battery	Morgan Hill	4	RA capacity-only	15	12/1/20
mNOC	10	C	LiOn battery	Various	4	RA capacity-only	10	10/1/19
Tesla (PG&E owned)	182.5	T	LiOn battery	Moss Landing	4	EPC	N/A	12/31/20

PG&E consulted its procurement review group (PRG) throughout the solicitation process.

¹ Resolution E-4909, Ordering Paragraph 15.

Details of PG&E's requests for relief in AL 5222-E

PG&E requested the following relief be approved in a Commission Resolution issued no later than 90 days from the filing of AL 5322-E²:

1. Approves the four storage projects and associated contracts resulting from its Local Sub Area RFO: Vistra Moss Landing (300 MW) Energy Storage Resource Adequacy Agreement (ESRAA); esVolta – Hummingbird (75 MW) ESRAA; Micronoc – mNOC AERS (10 MW) BTM CSA; and the Moss Landing Project (182.5 MW).
2. Finds that all procurement costs associated with the Vistra Moss Landing ESRAA, esVolta ESRAA, and Micronoc BTM CSA shall be recovered in rates via the Cost Allocation Mechanism (CAM) for the full term of the respective agreement and using the net cost calculation described in this Advice Letter.
3. Finds that the revenue requirement for the Moss Landing Project shall be recovered in rates via the CAM for the full useful life of the project using the net capacity cost calculation described in this Advice Letter.
4. Authorizes PG&E to record the revenue requirement based on actual costs up to the adopted cost forecast associated with the Moss Landing Project once the project achieves commercial operation to the New System Generation Balancing Account (NSGBA). Once included in the General Rate Case (GRC), the revenue requirement associated with the Moss Landing Project will be forecast as part of the GRC, but transferred to the NSGBA for recovery through the New System Generation Charge (NSGC).
5. Authorizes PG&E to seek recovery of the Moss Landing Project's capital expenditures and expenses in excess of the authorized cost cap in PG&E's GRC or any other appropriate proceeding, subject to reasonableness review of the incremental costs.

² PG&E Advice Letter 5322-E. Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers per Resolution E-4909. June 29, 2018. Pages 24-25. Note – all references to "this resolution" are to Commission Resolution E-4909.

6. Concludes that no certificate of public convenience and necessity, permit to construct, or notice of exempt construction, or associated CEQA analysis by the Commission, is required in connection with PG&E's Moss Landing Project pursuant to General Order 131-D.
7. Concludes that pursuant to General Order 131-D Section XIV(B), local jurisdictions acting pursuant to local authority are preempted from regulating the Moss Landing Project.
8. Finds that the Vistra Moss Landing ESRAA, esVolta ESRAA, Micronoc BTM CSA, and Moss Landing Project are eligible to meet the outstanding portion of PG&E's storage mandate obligation established by Assembly Bill 2514 as implemented by CPUC D.13-10-040 and qualify for LCR credits pursuant to D.13-02-015 and D.14-03-004.
9. Adopts the finding of fact and conclusion of law that PG&E complied with the Resolution in all other respects in carrying out its solicitation and executing the respective agreements.

PG&E's Local Sub-Area (LSA) Request for Offer (RFO) and its resulting energy storage solutions meet the requirements and goals set forth in the Resolution as follows:

1. Pacific Gas and Electric Company is authorized to hold one or more competitive solicitation to address two local sub-area capacity deficiencies in the Pease and South Bay-Moss Landing subarea and manage a high voltage in the Bogue subarea.

PG&E issued the Local Sub-Area RFO on February 28, 2018, to address the two local sub-area capacity deficiencies in the Pease and South Bay – Moss Landing sub-areas and the high voltage issue in the Bogue sub-area.

2. If PG&E does not commence the solicitation authorized by this Resolution within 90 days of its effective date, PG&E is required to notify the Commission's Executive Director in writing and include the justification.

PG&E issued its solicitation on February 28, 2018, less than 90 days from the Resolution's January 12, 2018 date of issuance.

3. PG&E may solicit bids for energy storage and/or preferred resources, either individually or in an aggregation.

PG&E's solicited offers specifically for energy storage in the Local Sub-Area RFO because of the requirement to issue a RFO in less than 90 days from the Resolutions date of issuance. PG&E will continue to engage with stakeholders to see if an additional solicitation is warranted that could include energy storage and preferred resources.

4. PG&E is required to take into account the known cost and on-line dates of any new or planned transmission solutions that reduce or eliminate the need for RMR contracts or their extension, when it selects resources for procurement in this solicitation.

As detailed more fully above and in Appendix K, PG&E has taken into account the planned transmission solutions. It found planned transmission solutions for the South Bay - Moss Landing local sub-area will eliminate the original local capacity area deficiency by the expected completion date of February 2019. Planned transmission solutions for the Pease and Bogue sub areas will reduce the local capacity needs by December 2020 and June 2022, respectively.

Given that resources in this locally constrained area have market power and may retire at any time³, there is risk of additional retirements in the future, which would reduce available capacity to meet Local Capacity Requirement (LCR) need. The storage contracts

³ General Order 167 requires that resources notify the CPUC within 90 days of retiring. Qualifying Facilities and Combined Heat and Power resources are not subject to this requirement.
http://docs.cpuc.ca.gov/PUBLISHED/GENERAL_ORDER/108114.htm#P633094

presented in this AL will help mitigate the impacts of future retirements by adding capacity to the respective local subarea.

5. Resources procured pursuant to this solicitation must be on-line and operational on or before a date sufficient to ensure that one or more of the RMR contracts for the three plants – Metcalf Energy Center, Feather River Energy Center, and Yuba City Energy Center – will not be renewed for any year from 2019 through 2022, if feasible and represent a reasonable cost savings to ratepayers.

PG&E executed contracts for four storage projects, having expected on-line dates of 10/1/19, 12/1/20, 12/1/20 and 12/31/20. Based on PG&E's evaluation methodology the contracts executed in the LSA ES RFO represent a positive market value to PG&E's portfolio.

6. Resources procured pursuant to this solicitation must be located within the relevant sub-area(s) and be interconnected at location(s) that will mitigate local capacity and voltage issues sufficient to reduce or eliminate the need for RMR contracts for the aforementioned plants.

All storage projects procured in this RFO are located in, and will be interconnected within, the South Bay-Moss Landing sub area. Resources were not procured for the Pease and Bogue sub areas because transmission solutions are expected to alleviate the LCR need.

7. Resources procured in this solicitation should be at a reasonable cost to ratepayers, taking into consideration the cost and value to PG&E, previous solicitations in which PG&E has awarded contracts to similar resources, the cost of the specific RMR contracts, with adjustments for contract terms such as contract length and expedited delivery date.

As seen in Appendix G and H, the market valuations of the four storage projects are all positive.

8. Any portfolio of resources selected and contracted with, including consideration of any new or planned transmission solutions that will reduce or eliminate the subarea deficiencies, must be of sufficient capacity and attributes to alleviate the deficiencies identified.

The approved transmission solutions eliminate the original deficiencies identified by the CAISO in each of the local sub-areas. The energy storage resources selected and contracted with add capacity to the constrained South Bay – Moss Landing local subarea. Together they may alleviate the need for backstop procurement by the CAISO.

9. PG&E is required to coordinate with the CAISO to ensure that the resources procured in this solicitation partially or wholly obviate the need for, or extension of, RMR contracts at question in this Resolution.

The CAISO has provided a letter of support (see Appendix J) for the benefits of providing storage capacity in the South Bay – Moss Landing subarea.

10. PG&E is required to indicate when seeking approval of the contracts whether the CAISO agrees that the resources procured in this solicitation partially or wholly eliminate the need for, or extension of, one or more of the RMR contracts at question in this Resolution.

The CAISO indicates that the planned transmission upgrades alleviate the immediate need that led to the RMR designations, however supports PG&E's procurement of energy storage resources and acknowledges the contribution that energy storage would provide to reduce the risk of future CAISO-forecasted deficiencies.

11. PG&E may consider accelerating projects from its 2016 storage RFO, should those projects meet all other criteria of the solicitation ordered by this Resolution.

As discussed in Section IV.D. above, only one project from the 2016 Energy Storage RFO is in a sub-area applicable to the current RFO. PG&E decided it would not be cost effective to accelerate the schedule for the Llagas project.

12. PG&E is required to hold at least one bidders' conference in advance of issuance of the request for offer (RFO).

In line with PG&E's normal solicitation process, PG&E held a participant's webinar shortly after the RFO was launched on March 7, 2018.

13. Pacific Gas and Electric Company may contract with any resource at reasonable cost, and file Tier 3 Advice Letters for approval of contracts resulting from this solicitation.

PG&E is hereby submitting a Tier 3 Advice Letter for approval of contracts resulting from this solicitation.

14. Pacific Gas and Electric Company shall take all reasonable steps to expedite the interconnection processes to allow the storage resource to connect to the grid.

PG&E's RFO team members engaged in discussions with PG&E's interconnection group and with the CAISO regarding ways to expedite the interconnection process for all projects that succeed in the solicitation. PG&E will continue these discussions and take any appropriate measures to reasonably expedite the interconnection process subject to applicable CAISO tariffs.

15. Pacific Gas and Electric Company may request authorization to record procurement costs for procurement in the solicitation

authorized by this Resolution in its Cost Allocation Mechanism account.

PG&E is hereby requesting authorization to record procurement costs for procurement in the solicitation authorized by this Resolution in its CAM account.

BACKGROUND

Overview of Commission Resolution E-4909

The Commission adopted Resolution E-4909 on January 11, 2018. This Resolution authorized PG&E to procure energy storage or preferred resources to address local deficiencies and ensure local reliability, to alleviate electric supply issues in two subareas and a voltage issue in another. Resolution E-4909 set forth the following parameters for the procurement⁴:

1. PG&E is required to take into consideration any new or planned transmission solutions that reduce or eliminate the need for RMR contracts or their extension, when it selects resources for procurement in this solicitation.
2. PG&E may solicit bids for energy storage and/or preferred resources, either individually or in an aggregation.
3. PG&E may consider accelerating projects from its 2016 storage RFO, should those projects meet all other criteria of the solicitation ordered by this Resolution. Resources procured pursuant to this solicitation must be both:
 - a. On-line and operational on or before a date sufficient to ensure that the RMR contracts for the three plants – Metcalf Energy Center, Feather River Energy Center, and Yuba City Energy

⁴ Resolution E-4909. California Public Utilities Commission. January 11, 2018. Pages 7-8.

Center – will not be renewed in any year from 2019 through 2022.

- b. Located within the relevant sub-area(s) and be interconnected at location(s) that will mitigate local capacity and voltage issues sufficient to obviate the need for RMR contracts for the aforementioned plants.
4. Resources procured in this solicitation should be at a reasonable cost to ratepayers, taking into consideration the cost and value to PG&E, previous solicitations in which PG&E has awarded contracts to similar resources, the cost of the specific RMR contracts, with adjustments for contract terms such as contract length and expedited delivery date, and the known or estimated cost and benefits associated with new and planned transmission solutions.
5. The portfolio of resources selected and contracted with must be of sufficient capacity and attributes to reduce or eliminate the deficiencies identified, as determined in coordination with the CAISO.
6. PG&E is required to hold a bidders' conference in advance of the RFO.

Overview: Energy Storage Procurement Framework and Design Program

The Commission adopted the Energy Storage Procurement Framework and Design Program with D.13-10-040 in October 2013, in response to Assembly Bill (AB) 2514 (2010, Skinner), which required the Commission to determine appropriate procurement targets for qualifying energy storage resources, with a procurement deadline of December 31, 2020. D.13-10-040 adopted procurement requirements and program framework, for the three investor owned utilities (IOUs). Table 2, below, summarizes the procurement targets for each IOU.

Table 2.

	2014	2016	2018	2020	Total
<u>SCE</u>					
Transmission	50 MWs	65 MWs	85 MWs	110 MWs	310 MWs
Distribution	30 MWs	40 MWs	50 MWs	65 MWs	185 MWs
Customer	10 MWs	15 MWs	25 MWs	35 MWs	85 MWs
<u>PG&E</u>					
Transmission	50 MWs	65 MWs	85 MWs	110 MWs	310 MWs
Distribution	30 MWs	40 MWs	50 MWs	65 MWs	185 MWs
Customer	10 MWs	15 MWs	25 MWs	35 MWs	85 MWs
<u>SDG&E</u>					
Transmission	10 MWs	15 MWs	22 MWs	33 MWs	80 MWs
Distribution	7 MWs	10 MWs	15 MWs	23 MWs	55 MWs
Customer	3 MWs	5 MWs	8 MWs	14 MWs	30 MWs
TOTAL	200 MWs	270 MWs	365 MWs	490 MWs	1325 MWs

Additional background information about the Energy Storage Procurement Framework and Design Program, including links to laws and relevant Commission decisions, is available at:

<http://www.cpuc.ca.gov/General.aspx?id=3462>.

CAISO's 2017-2018 Transmission Plan

The CAISO adopted the 2017-2018 Transmission Plan (TPP) in March 2018, which includes upgrades proposed by PG&E sufficient to reduce the local capacity requirement in the South Bay Moss Landing by 400-600 MWs. Planned transmission solutions will address the issues in the Pease and Bogue subareas by December 2020 and June 2022, respectively.

PG&E acknowledges in AL 5322-E that the upgrades approved in the TPP eliminate the 2019 need addressed by Resolution E-4909. PG&E argues that projected future reliability issues in the South Bay justify the proposed storage procurement in the Moss Landing subarea.

NOTICE

Notice of AL 5322-E was made by publication in the Commission's Daily Calendar. PG&E states that a copy of the Advice Letter was mailed and distributed in accordance with Section 4 of General Order 96-B.

PROTESTS

PG&E's Advice Letter 5322-E was timely protested by Direct Access Customer Coalition (DACC), Calpine, California CCA, and the Office of Ratepayer Advocates (ORA)⁵. The following parties filed a response in support of approval of PG&E Advice Letter 5322-E: California Energy Storage Alliance (CESA), and Earthjustice, Sierra Club, Union of Concerned Scientists, Environmental Defense Fund, California Environmental Justice Alliance (hereafter Environmental Groups). Monterey Bay Community Power (MCBP) also filed a response to AL 5322-E. We organize the discussion by topic, below.

Compliance with Commission Resolution E-4909

In their protests, DACC⁶, ORA⁷, CalCCA⁸, and Calpine⁹ contend that PG&E AL 5322-E is out of compliance with Resolution E-4909. DACC, Calpine and ORA base their contention on the following reasons:

⁵ At the time of issuing this Resolution, ORA's name has changed to the Public Advocate's Office (PAO). We use ORA throughout, as this is the name with which the entity filed its on PG&E AL 5322-E.

⁶ Protest of the Direct Access Customer Coalition to Pacific Gas and Electric Company's Advice Letter 5322-E Requesting Approval of Energy Storage Contracts. July 19, 2018. Page 1.

⁷ ORA Protest of Pacific Gas and Electric Company's (PG&E) Advice Letter 5322-E, Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers per Resolution E-4909. July 19, 2018. Pages 2-3.

1. Upgrades have been approved by the CAISO in the 2017-2018 Transmission Plan (TPP) to address the capacity need that led to the RMR contract for Metcalf and Commission Resolution E-4909;
2. PG&E did not include analysis of the costs of the storage contracts, as compared to the Metcalf RMR contract and other energy storage solicitations; and,
3. PG&E did not coordinate with the CAISO as required by Resolution E-4909.

Local Capacity Needs and the 2017-2018 Transmission Plan

Calpine claims that Resolution E-4909 was very narrowly scoped such that it made procurement by PG&E contingent on whether the sub-area required the procurement.¹⁰ Given that transmission solutions were approved in the TPP, Calpine argues that it solved the procurement directives of Resolution E-4909.¹¹

DACC agrees and argues that PG&E should have terminated its solicitation for the South Bay – Moss Landing subarea given the upgrades approved in the CAISO's TPP.¹² CalCCA argues that, because the procurement does not meet an immediate reliability need, it is unjust and unreasonable.¹³

On the other side, CESA's response points to the CAISO's 2023 Local Capacity Technical Study, which forecasts a local capacity need in the South Bay-Moss Landing sub-area shows a forecasted LCR need of 1,977 MW by

⁸ Protest of CalCCA to Pacific Gas and Electric Company Advice Letter 5322-E (Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers Per Resolution E-4909). July 19, 2018.

⁹ Protest of Calpine Corporation to PG&E Advice Letter No. 5322-E. July 19, 2018. Page 1.

¹⁰ Ibid. Page 3.

¹¹ Ibid. Page 4.

¹² Protest of the Direct Access Customer Coalition to Pacific Gas and Electric Company's Advice Letter 5322-E Requesting Approval of Energy Storage Contracts. July 19, 2018. Page 2.

¹³ Protest of CalCCA to Pacific Gas and Electric Company Advice Letter 5322-E (Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers per Resolution E-4909). July 19, 2018. Pages 5-6.

2023. This forecast assumes completion of the transmission upgrades to address the deficiency created by Metcalf retirement, that were approved in the CAISO's 2017-2018 transmission plan.¹⁴ CESA points to PG&E's observation in AL 5322-E that "...the Metcalf plant is only the first of several thermal generation plants that face risks of economic retirements in this local sub-area...(t)hus, similar RMR backstop procurement may occur but for the near term effects of the PG&E storage procurement." CESA goes on to note that the CAISO has also made this observation.¹⁵ CESA urges the Commission to approve AL 5322-E as just, reasonable and cost-effective procurement to alleviate forecasted local need and add more fast responding and flexible supply to the grid.¹⁶

The Environmental Groups support AL 5322-E on similar grounds: "(t)he proposed projects mitigate the risk of costly capacity contracts with existing gas-fired generation, provide needed additional flexible capacity to the system, and will result in significant air quality and climate benefits."¹⁷ Environmental Groups also point to both the CAISO's 2023 Local Capacity Technical Analysis, which forecasts an increase in local area need in the South Bay Moss Landing subarea by more than 300 MWs, and that several plants supplying the subarea have contracts that expire in the 2019-2021 time frame. Environmental Groups state the concern that "(a)bsent additional resource procurement in the sub-area, existing generators will remain in a position to leverage capacity constraints to obtain elevated capacity payments. Approval of the proposed energy storage contracts will protect ratepayers by mitigating the exercise of market power by local gas-fired generation."¹⁸

¹⁴ Response of the California Energy Storage Alliance to Advice Letter 5322-E of Pacific Gas and Electric Company. July 19, 2018. Page 3.

¹⁵ Ibid.

¹⁶ Ibid. Page 4.

¹⁷ Earthjustice, Union of Concerned Scientists, California Environmental Justice Alliance, Sierra Club and Environmental Defense Fund Support for PG&E Advice Letter 5322-E. July 19, 2018. Page 2.

¹⁸ Ibid. Pages 2-4.

Coordination with CAISO

DACC and ORA assert that there may not have been sufficient coordination between the CAISO and PG&E for compliance with Ordering Paragraphs 9 and 10, and points out that there is little discussion in AL 5322-E that speaks to the process of coordination between PG&E and the CAISO.¹⁹ Calpine claims that, because AL 5322-E does not include technical analyses or studies regarding the effectiveness of the 567.5 MW procurement at addressing local deficiencies, that it fails the requirements of Resolution E-4909.²⁰

Resource Effectiveness

ORA states that the effectiveness of the resources should have been addressed before the procurement occurred, and points to the fact that the duration of discharge from the system is short – four hours in this case – and that the resources rely on external sources of power to charge. ORA claims that both characteristics could make the resources incompatible with reliability standards.²¹ Calpine urges the Commission to “...not approve the Advice Letter unless and until PG&E provides the necessary CAISO technical analyses to support its proposed procurement.”²²

¹⁹ Protest of the Direct Access Customer Coalition to Pacific Gas and Electric Company’s Advice Letter 5322-E Requesting Approval of Energy Storage Contracts. July 19, 2018. Page 4; ORA Protest of Pacific Gas and Electric Company’s (PG&E) Advice Letter 5322-E, Energy Storage Contracts Resulting from PG&E’s Local Sub-Area Request for Offers per Resolution E-4909. July 19, 2018. Page 8.

²⁰ Protest of Calpine Corporation to PG&E Advice Letter No. 5322-E. July 19, 2018. Page 5.

²¹ ORA Protest of Pacific Gas and Electric Company’s (PG&E) Advice Letter 5322-E, Energy Storage Contracts Resulting from PG&E’s Local Sub-Area Request for Offers per Resolution E-4909. July 19, 2018. Page 8.

²² Protest of Calpine Corporation to PG&E Advice Letter No. 5322-E. July 19, 2018. Page 6.

Cost Effectiveness

Calpine²³, DACC²⁴ and CalCCA point to Ordering Paragraphs 4 and 7 and state that PG&E did not comply with these requirements. ORA agrees and dismisses PG&E's assertion that each project has a positive value to the portfolio, as this was not a criteria laid out in Resolution E-4909, and points out that "PG&E did not provide analysis or explain how the cost of the four energy storage projects are reasonable taking into consideration the cost of the Metcalf RMR contract."²⁵

ORA points to the cost of the transmission solutions approved by the CAISO - \$14 million – as compared to the cost of PG&E's proposed portfolio in AL 5322-E, as proof that the cost of the portfolio is not reasonable to ratepayers.²⁶

Cost Recovery

DACC asserts PG&E failed to provide sufficient justification or analysis of the four storage contracts to support Commission approval of long-term CAM contracts to replace a short-term RMR contract for the Metcalf Energy Center.²⁷ CalCCA asserts the local sub-area deficiencies that gave rise to Resolution E-4909 requirements no longer exist and protests the use of CAM contracts to procure additional generation resources on behalf of CCA

²³ Ibid. Page 7.

²⁴ Protest of the Direct Access Customer Coalition to Pacific Gas and Electric Company's Advice Letter 5322-E Requesting Approval of Energy Storage Contracts. July 19, 2018. Page 4.

²⁵ ORA Protest of Pacific Gas and Electric Company's (PG&E) Advice Letter 5322-E, Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers per Resolution E-4909. July 19, 2018. Page 9.

²⁶ Ibid. Page 7.

²⁷ DACC Protest of Pacific Gas and Electric Company's (PG&E) Advice Letter 5322-E, Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers per Resolution E-4909. July 19, 2018. Page 3.

customers without a current reliability need.²⁸ CalCCA argues they are statutorily entitled to procure generation for their own customer base.

Procedural Vehicle

Calpine, ORA²⁹ and CalCCA³⁰ recommend the contracts be deferred to a formal Application process. Calpine focuses its recommendations on three distinct procedural options for the Commission. First, Calpine recommends that the Commission reject AL 5322-E as out of compliance with Resolution E-4909 for the reasons mentioned earlier in this section.³¹ Second, Calpine recommends, should the Commission choose not to reject the AL, at a minimum, PG&E should be required to resubmit its proposal to own a 182.5 MW project developed by Tesla in an Application. Third and finally, Calpine recommends that, should the Commission choose to proceed with review of AL 5322-E that it should hold evidentiary hearings, and points to Rule 7.4.1 in General Order (G.O.) 96-B.³²

Confidentiality

In its protest, as corrected on July 30, ORA states that it disagrees with PG&E regarding the confidentiality of the total cost of the four contracts. ORA points out that the AL process does not contain a process by which it can contest the confidentiality. ORA requests that Energy Division defer its request to the Commission's Administrative Law Judge (ALJ) Division, and cites Section 10.5 of General Order 96-B.

²⁸ Protest of CalCCA to Pacific Gas and Electric Company Advice Letter 5322-E (Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers per Resolution E-4909). July 19, 2018. Pages 4 & 6.

²⁹ ORA Protest of Pacific Gas and Electric Company's (PG&E) Advice Letter 5322-E, Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers per Resolution E-4909. July 19, 2018. Page 11.

³⁰ Protest of CalCCA to Pacific Gas and Electric Company Advice Letter 5322-E (Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers per Resolution E-4909). July 19, 2018. Pages 4-5.

³¹ Protest of Calpine Corporation to PG&E Advice Letter No. 5322-E. July 19, 2018. Page 1.

³² Ibid. Page 9.

Other Issues

Environmental Groups point to the superior environmental benefits of energy storage as it reduces reliance on gas-fired generation, particularly for disadvantaged communities which are disproportionately impacted by air pollution.³³ MCBP expresses general support for energy storage procurement, as is represented by AL 5322-E, and asks the Commission to direct PG&E to investigate partnership opportunities with the CCA.³⁴

PG&E'S REPLY TO PROTESTS

PG&E responded to the protests of ORA, CalCCA, and Calpine on July 26, 2018.

Compliance with Commission Resolution E-4909

PG&E argues that the directives of Resolution E-4909 are sufficiently broad to cover procurement for reliability in the South Bay Moss Landing subarea beyond the deficiency associated with Metcalf. PG&E states that "it is clear the Commission was equally concerned about the process and circumstances leading up to the RMR designations. The specific issue in the three local sub-areas identified by the Commission is that no local capacity margin exists, meaning that when the California Independent System Operator (CAISO) identifies capacity and voltage deficiencies, the circumstances lead almost inexorably to an RMR designation instead of meaningful competition or considerations of alternatives, to the potential detriment of PG&E's customers."³⁵

³³ Earthjustice, Union of Concerned Scientists, California Environmental Justice Alliance, Sierra Club and Environmental Defense Fund Support for PG&E Advice Letter 5322-E. July 19, 2018. Page 4.

³⁴ Monterey Bay Community Power Authority Response to Pacific Gas and Electric Company Advice Letter 5322-E (Energy Storage Contracts Per Resolution E-4909). July 19, 2018. Page 2.

³⁵ Pacific Gas and Electric Company's Reply to Protests of Advice Letter 5322-E for Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers Per Resolution E-4909. July 26, 2018. Page 2.

PG&E also argues that parties read the ordering paragraphs of Resolution E-4909 too narrowly, and that these directives established the parameters for PG&E's RFO, and that "...the Resolution's language and intent would not be fully satisfied by the planned and approved transmission projects because these projects do not reasonably ensure that the RMR contract for Metcalf (and potentially other generators) will not be renewed in the future and because the need for additional capacity in the SBML LSA will still exist once they are in service."³⁶

Local Capacity Needs and the 2017-2018 Transmission Plan

PG&E argues that the transmission projects approved in CAISO's TPP that address the original deficiency identified by the CAISO in the South Bay – Moss Landing subarea -- only temporarily alleviate the deficiency. PG&E points to a highly constrained resource stack and the projected increase of the local capacity requirement in the South Bay Moss Landing subarea of 324 MWs by 2023 and that, absent any alternative, the Metcalf plant could stay online.³⁷ PG&E projects that the capacity deficiencies would reemerge in the 2019-2022 timeframe, especially if any of the gas fired generators serving the subarea also intend to retire."³⁸ PG&E notes that the Gilroy Cogen Unit has notified the CAISO of its intention to retire, and points to the Announced Retirement and Mothball List on the CAISO's website, which lists the Gilroy Cogen Unit as requesting retirement as of January 1, 2019.³⁹ PG&E includes the following graphic in its reply, which shows the current stack of generating resources that serve the South-Bay Moss Landing subarea.⁴⁰

³⁶ Ibid. Page 4.

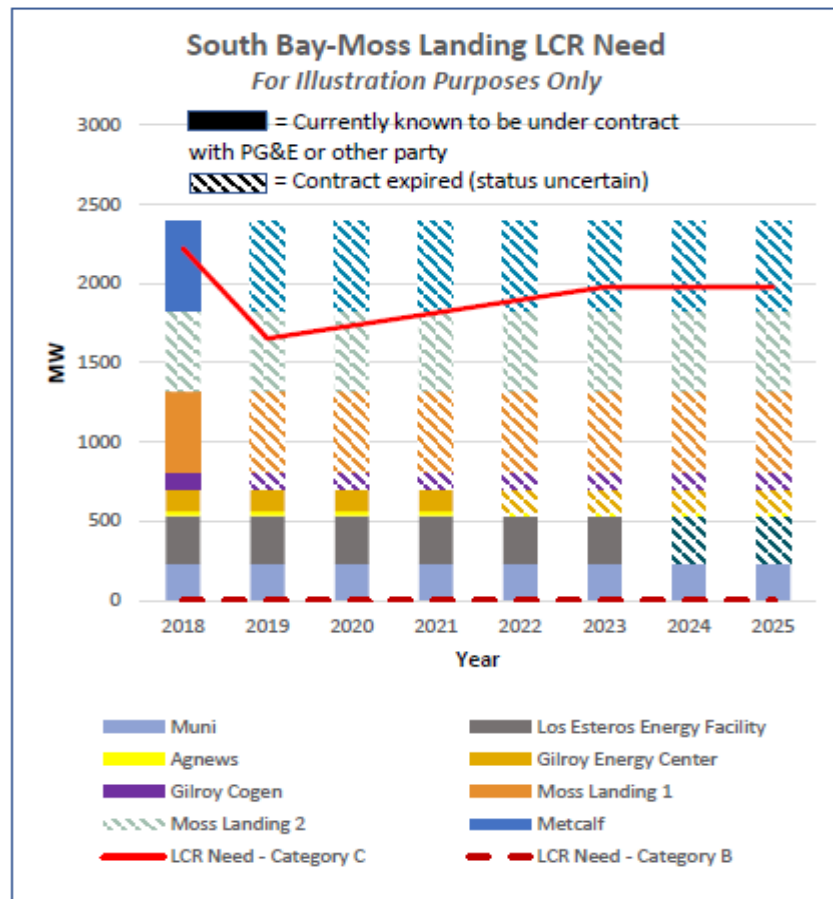
³⁷ Pacific Gas and Electric Company's Reply to Protests of Advice Letter 5322-E for Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers Per Resolution E-4909. July 26, 2018. Page 7.

³⁸ Ibid. Page 4.

³⁹ Ibid. Page 7. <http://www.caiso.com/planning/Pages/ReliabilityRequirements/Default.aspx>, accessed July 28, 2018.

⁴⁰ Ibid. Page 5.

Table 3.



Coordination with CAISO

PG&E responds to protestor's claims that the utility did not coordinate with the CAISO by both pointing to the letter it filed as Attachment J to AL 5322-E and with the inclusion of the following timeline detailing PG&E and CAISO coordination.

Table 4.

Date	Name	Description
11/02/17	RMR agreements filed at FERC	
1/2/18	Call with CAISO on PG&E's planning studies on Metcalf RMR need	PG&E Transmission Planning discussed its analysis related to Metcalf RMR needs as well as potential options to mitigate the transmission issues driving the RMR designation.
1/11/18	First Coordination Call between PG&E and CAISO	PG&E and CAISO discussed the Draft Resolution E-4909 and timeline for CAISO evaluation of procurement requirements.
1/12/18	Final Resolution E-4909 Issued	
2/1/18	CAISO publishes draft 2017-2018 Transmission Plan	
2/7/18	Second Coordination Call between PG&E and CAISO	A meeting between the CAISO and PG&E to discuss the requirements of Resolution E-4909, the timing of PG&E's RFO, and the CAISO's Evaluation.
2/8/18	CAISO 2017-2018 Transmission Planning Process Stakeholder meeting	Stakeholder meeting which included review and discussion of CAISO's analysis on South Bay-Moss Landing Sub-area LCRs and recommendations.
2/23/18	PG&E submits comments to CAISO's 2017-2018 Transmission Planning Process	PG&E submits comments on Draft 2017-2018 CAISO Transmission Plan Report posted on February 1, 2018 and discussed at the stakeholder meeting on February 8, 2018. Specifically, PG&E supports CAISO analysis and recommendations in the Economic Section of the Draft Plan with regards to the South Bay-Moss Landing Sub-Area Local Capacity Requirements.
2/28/18	PG&E Issues RFO	
3/1/18	Third Coordination Call with between PG&E and CAISO	This was a follow-up meeting between the CAISO and PG&E to discuss the requirements of Resolution E-4909, the timing of PG&E's RFO, and the CAISO's Evaluation.
3/14/18	Call on CAISO Interconnection	This was a call to discuss the interconnection process requirements for resources that PG&E procures through the RFO. PG&E sought with this

	Requirements	consultation to ensure that the resources would count toward RA requirements as anticipated.
3/22/18	CAISO Board Approves the 2017-18 Transmission Plan	
4/18/18	PG&E develops shortlist for Local Sub-Area RFO	
4/18/18	PG&E Sends RFO Shortlist to CAISO	
4/19/18	Fourth Coordination Meeting to Discuss Local Sub-Area RFO Results with CAISO	Following execution of a non-disclosure agreement to protect market-sensitive information, PG&E and CAISO met to discuss: (1) the short list of bids; and (2) CAISO's Evaluation and process to provide public feedback pursuant to Resolution E-4909.
5/11/18	Fifth Coordination Call to Review CAISO Evaluation of Local Sub-Area RFO	This meeting was to review the status of the CAISO's review letter and PG&E's timing for the Advice Letter filing.
5/21/18	CAISO Provides Letter to PG&E	
6/1/18	Contract Execution	
6/29/18	PG&E files Advice Letter with CPUC	

As final response to this point, PG&E states that the CAISO has the full discretion under its tariff to order backstop procurement at any time, irrespective of the wishes or actions of the Commission. PG&E points out that it is unreasonable to expect CAISO to determine now that it will not conduct backstop procurement years into the future.⁴¹

Resource Effectiveness

In response to the claims by ORA, PG&E points out that the 4 hour local reliability standard for storage still remains.⁴² PG&E also responds to claims that the reliability benefits of the four resources are uncertain, by pointing out that it is after the projects are approved by the Commission, and the determination made by the Commission that the projects will contribute to local reliability, that the CAISO and developer will take steps to ensure RA

⁴¹ Ibid. Page 10.

⁴² Ibid. Page 8.

qualification.⁴³ Finally, PG&E also argues that the Commission has a reasonable basis to find that the storage projects in AL 5322-E can and will provide maximum resource adequacy and flexible RA credit.⁴⁴

Cost and Value

With regard to the cost and value of its procurement, PG&E points out that it based its assessment of value on the long-established standard of least cost best fit (LCBF) in general, as well as portfolio adjusted value (PAV) for PG&E. Each of the projects represented by AL 5322-E has a positive PAV and, thus, offers greater value than cost to PG&E ratepayers.⁴⁵ PG&E also includes with its reply Confidential Appendix A, which details the comparison of the AL 5322-E contracts to the cost of the capacity procurement mechanism (CPM) and future RMR agreements.⁴⁶ PG&E argues that its analysis shows that the projects in AL 5322-E provide greater value to ratepayers than these other procurement options. PG&E goes on to state that cost alone is not a sufficient basis of comparison as energy storage resources offer benefits that gas resources do not – flexible capacity double that of the project capacity, given the bi-directional ability of storage to both dispatch and absorb energy, and that the procurement would count against PG&E's energy storage procurement requirement, thus avoiding future related procurement costs.

Cost Recovery

PG&E does not respond to CalCCA and DACC protests regarding use of Cost Allocation Mechanism (CAM) cost recovery for the four storage projects proposed in Advice Letter 5322-E which would allocate new PG&E procurement costs to unbundled customers.

⁴³ Ibid. Page 9.

⁴⁴ Ibid. Page 8.

⁴⁵ Ibid. Pages 12 – 13.

⁴⁶ Ibid. Pages 13 – 14.

Procedural Vehicle

In response to claims that the relief sought in AL 5322-E is inappropriate for the Advice Letter process, and thus should be considered in an Application, PG&E contends both that this question was answered in Resolution E-4909, and that there is precedent for approving storage in the AL process.⁴⁷

DISCUSSION

The Commission has reviewed and evaluated AL 5322-E based on the following criteria:

- Consistency with Commission Resolution E-4909;
- Consistency with the Energy Storage Procurement Framework and Design Program;
- Procurement evaluation methodology;
- Cost reasonableness;
- Independent Evaluator review; and,
- Cost recovery.

We also considered issues raised by protestants and respondents to AL 5322-E, as well as PG&E's specific request for relief in AL 5322-E.

Consistency with Resolution E-4909

Local Reliability in South Bay – Moss Landing Subarea

We have reviewed the CAISO's Announced Retirements and Mothball List, as well as a June 28, 2018 communication from Calpine to the CAISO, both of which reflect the potential retirement of the 120 MW Gilroy Cogeneration unit. The unit in question is currently under contract with PG&E. We also note that the Energy Commission's forecast, and the CAISO's forecast, increased in the South Bay Moss Landing subarea by 324 MWs for 2023 in

⁴⁷ Ibid. Pages 14 – 15.

the most recent Local Capacity Technical Study (LCR Study). We have also reviewed the resources currently providing capacity to the South Bay Moss Landing sub-area and have verified their various contract sunset dates against the chart provided by PG&E (Table 3). These factors, taken together, indicate that there is a real potential for future supply shortages in the South Bay Moss Landing subarea, starting as soon as 2019.

The \$14 million in transmission upgrades approved by the CAISO in the 2017-2018 TPP reduce the local capacity obligation in the South Bay Moss Landing subarea by 400 – 600 MWs and do eliminate the original potential deficiency created by Metcalf, as recognized in AL 5322-E by both PG&E and CAISO, and as protestors have pointed out. These upgrades do not eliminate the growing reliability problem in the region entirely, however, and do not guarantee that the capacity from Metcalf will not be needed in the future even after the upgrades are completed, given potential retirement of other gas-fired plants in the subarea.

We continue to be concerned that the contracting position of the majority of the gas fired resources serving the South Bay – Moss Landing subarea, and potential retirement of the Gilroy Cogen plant, create the conditions for future exercise of market power in the subarea. This potentiality is significantly reduced with the long-term procurement of capacity to replace the need to continue with short term contracts for gas-fired capacity.

The scope of Resolution E-4909 was specific to the three plants in question at the time – Yuba City, Feather River and Metcalf Energy Centers – and the capacity or voltage issues in their respective subareas that their retirement would create. If there were no indication of future capacity retirements in the subarea, which may create a need to extend the RMR agreement for Metcalf, then we would likely concur with parties that this procurement should be submitted in an Application. However, given that we do have such an indication, the original direction of Resolution E-4909 applies, and the Advice Letter and Resolution process remains appropriate for the procurement represented by AL 5322-E. Thus, the protests of DACC, ORA, CalCCA, and Calpine are rejected in this regard.

Coordination with CAISO

The letter from the CAISO discusses the transmission upgrades that were approved in the CAISO's TPP to address the original deficiency that would be created by the retirement of Metcalf. The letter also states willingness to work with PG&E to "validate the effectiveness of the resources procured." Finally, the letter indicates concern with reliability in the South Bay – Moss Landing subarea: "The ISO supports the procurement of storage as a general matter and recognizes that energy storage can reduce the risk of future local capacity deficiencies in the event of generation retirement, especially in the South Bay – Moss Landing subarea." PG&E's coordination with the CAISO, and the letter from the CAISO to PG&E, is sufficient for purposes of compliance with Resolution E-4909. Thus, the protests of DACC and ORA are rejected in this regard.

Effectiveness of Resources

Based on our analysis of AL 5322-E, the projects will be interconnected at locations that will directly benefit reliability in the South Bay Moss Landing subarea.

The Commission has not, to date, required precertification by the CAISO that resources meet resource adequacy needs in advance of approving a contract for that resource. Such determinations, as pointed out by PG&E, are made after projects are approved.⁴⁸ CAISO also indicates that certification will occur at a later date in the letter that accompanies AL 5322-E. We concur with the responses of PG&E and reject the protest of Calpine in this regard.

We also confirm that the Commission has not established durations for energy storage to qualify for RA other than four hours, as PG&E points out

⁴⁸ Pacific Gas and Electric Company's Reply to Protests of Advice Letter 5322-E for Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers Per Resolution E-4909. July 26, 2018. Page 9.

in its reply.⁴⁹ Thus, the four-hour dispatch duration included in the contracts in AL 5322-E is consistent with existing regulation and is, therefore, appropriate. We reject the protest of ORA in this regard.

Finally, PG&E argues that the Commission has a reasonable basis to find that the storage projects in AL 5322-E can and will provide maximum local resource adequacy value. We agree. Each of the projects are located in the South Bay Moss Landing subarea and are interconnected at locations that will directly contribute to local reliability in the subarea.

Consistency with the Energy Storage Procurement Framework and Design Program

The Energy Storage Procurement Framework and Design Program was first established with Commission Decision (D.) 13-10-040. This decision established the procurement schedule, individual IOU targets, and eligibility for the program. Storage procured pursuant to AB 2514 targets must satisfy one or more of certain policy goals: reduction of GHG, integration of renewables, and grid optimization including peak reductions, reliability needs, and transmission and distribution deferment.

PG&E has a target of 580 megawatts of energy storage, to be procured over four biennial solicitations. This target is divided among three points of interconnection, or domains, as follows: 310 MWs in the transmission domain, 165 MWs in the distribution domain, and 85 MWs behind the meter in the customer domain. At the time of writing this Resolution, the Commission has approved the following energy storage capacity procurement by PG&E: 40 MWs toward its transmission target, 19 MWs toward its distribution target, and 19.54 MWs toward its customer target. PG&E also has a pending application for 165 MWs of energy storage from its 2016 solicitation, 135 MWs of which is in the transmission domain, 20 MWs in the distribution domain, and 10 MWs in the customer domain.

⁴⁹ Ibid. Page 8.

Table 5.

<i>Domain</i>	<i>Target</i>	<i>MWs to Date</i>	<i>2016 RFO</i>	<i>AL 5322-E</i>	<i>TOTAL</i>
Transmission	310 MW	40 MW	135 MW	557.5 MW	732.5 MW
Distribution	165 MW	19 MW	20 MW	0 MWs	39 MW
Customer	85 MW	19.54 MW	10 MW	10 MW	39.54 MW
TOTAL	580 MW	69 MW	165 MW	567.5 MW	811.04 MW

Regarding project eligibility, D.13-10-040 defines it as follows:

All energy storage resources as defined by Pub. Util. Code § 2835(a), except for pumped storage resources over 50 MW, are eligible to bid into the energy storage solicitations. Energy storage that could be obtained from plug-in electric vehicles and programs/systems that utilize electric vehicles for grid services (Vehicle to Grid), could count for procurement projects.⁵⁰

All four projects procured by PG&E in its solicitation will be comprised of lithium ion batteries and are eligible per these criteria. PG&E may count its storage capacity procurement represented by AL 5322-E against any outstanding energy storage obligation.

PG&E has some ability to shift MW procurement obligations across domains. Even with this ability, as can be inferred from Table 5, the approval of the projects in AL 5322-E would put PG&E in excess of its storage procurement obligation, per D.13-10-040.

Project Evaluation Methodology

PG&E retained Merrimack Energy Group, Inc., as the Independent Evaluator (IE) for this solicitation. Merrimack participated in RFO design, and oversaw the evaluation of bids, development of the shortlist, selection of final bids, and negotiation of offers. The IE found that the evaluation methodology was reasonable, and was applied fairly to all bidders. The IE's

⁵⁰ Decision 13-10-040, Rulemaking 10-12-007. October 21, 2013. Appendix A, page 5.

analysis agreed with PG&E that, using its portfolio adjusted value analysis, the projects in AL 5322-E confer an overall greater value than cost to PG&E's ratepayers. The IE supports the approval of all four projects by the Commission.

We have reviewed PG&E's Portfolio Adjusted Value (PAV) methodology, and the Independent Evaluator report, and found no issue with PG&E's rankings or methodology. It is consistent with the methodology used by PG&E to rank storage offers in prior energy storage solicitations. We conclude that the PAV methodology that PG&E used to rank bids is reasonable.

We agree with Calpine, DACC, CaCCA and ORA that PG&E did not offer details of the comparative cost analysis required by Ordering Paragraphs 4 and 7 of Resolution E-4909, in AL 5322-E. However, PG&E provided those details as an attachment to their reply to protests, filed on July 26, 2018. Within its response, PG&E included a comparison showing that, in considering the unique benefits of the proposed storage projects as compared to Metcalf, the projects result in net benefits over the Metcalf RMR agreement. By including this information in its response, PG&E has submitted it in the record of this AL.

Cost Reasonableness

PG&E compared storage contract costs to PG&E's 2016 energy storage procurement, Metcalf RMR contract, and provided details of this comparison in its reply to protests.

Comparison to 2016 Energy Storage RFO

The prices in AL 5322-E are on average slightly higher than PG&E's 2016 storage RFO contract prices, which can be explained by the fact that the projects in AL 5322-E will come on-line several years earlier than those procured in PG&E's 2016 RFO. Tables 6 and 7, below, were included in

Appendix A to PG&E's reply to protest, and illustrates a comparison of the third-party contracts and utility-owned projects, respectively, in both AL 5322-E and PG&E's 2016 RFO.

Table 6. REDACTED

Table 7. REDACTED

Comparison to Metcalf RMR

PG&E also conducted a cost and benefit analysis which revealed that, in considering the benefits of the proposed storage projects in AL 5322-E, the four projects result in a net positive value over the Metcalf RMR. PG&E's analysis is illustrated in the Table 8, below, which was provided by PG&E as Appendix A to its reply to protests. This table illustrates a total savings to PG&E ratepayers of \$211/kW-year over the Metcalf RMR contracts, which we calculate as an estimated \$233 million in overall benefit over 10 years, over an extension of the Metcalf RMR agreement. Given that the final cost of the Metcalf RMR agreement is slightly less than the CAISO's capacity procurement mechanism (CPM) soft offer cap of \$75.68/kW-year, it is reasonable to assume that the benefit of the projects in AL 5322-E confers a total benefit slightly greater in comparison to the CPM.

Table 8. REDACTED

We have evaluated PG&E's PAV methodology, and its comparison to its 2016 Energy Storage RFO contracts and the Metcalf agreement and find PG&E's analysis to be reasonable. The protests of Calpine, DACC, CalCCA and ORA are therefore rejected in this regard.

Cost Recovery

In Resolution E-4909 the Commission stated that PG&E may request authorization to record procurement costs for procurement in the solicitation authorized by this Resolution in its Cost Allocation Mechanism account. PG&E requests that costs for the three third party contracts, with MicroNoc, Dynegy and Hummingbird Energy Storage, be recoverable in rates via the Cost Allocation Mechanism (CAM) over the term of the agreements. PG&E also requests that the full cost of its utility owned project from Tesla be recoverable through its revenue requirement via the CAM for the life of the agreement.

The Commission agrees with PG&E that ongoing and future local reliability concerns warrant CAM treatment of this storage procurement for the three third-party owned storage contracts. For the proposed 182.5 MW utility-owned project, we look to the precedent established in Commission Resolution E-4791 regarding utility owned storage to address Aliso Canyon reliability concerns. In that Resolution, we ordered SCE to file an Application for reasonableness review of utility-owned or operated projects within 90 days after their operational start date.⁵¹ PG&E is directed to file an application for reasonableness review of the utility-owned Moss Landing Energy Storage Project within 90 days after its operational start date.

Therefore, the protests of DACC, CalCCA against CAM treatment of this procurement are rejected on this issue.

Environmental Benefits

We concur with the Environmental Parties and CESA that storage resources, as those represented in AL 5322-E, provide superior environmental solution over natural gas fired resources to supplying locational capacity. The Commission has recognized this in ordering preferred resource and storage procurement in Southern California Edison (SCE) and San Diego Gas and

⁵¹ Commission Resolution E-4749, May 26, 2016. Page 21.

Electric's local capacity procurements to replace conventional generation in D.13-02-015 and D.14-03-004, and supported local procurement of storage with the approval of SCE's preferred resources pilot in D.18-07-023. In addition, the proposed projects help reduce GHG emissions which is one of the policy objectives of the Energy Storage Framework.

Procedural Vehicle – Advice Letter vs. Application

The question of appropriate procedural vehicle in which to consider the issue, and any projects resulting from the solicitation, was asked, debated, and answered within Resolution E-4909:

“We maintain that the Advice Letter process is an acceptable vehicle for procurement review and contract approval, in certain instances. Advice Letters have been used to approve contracts resulting from the Renewable Auction Mechanism (RAM), the Demand Response Auction Mechanism (DRAM) pilot, and both SCE and SDG&E's procurements in response to Commission Resolution E-4791. We decline to require PG&E to file contracts resulting from this solicitation in an Application. We also decline to adopt ORA's recommendation for a longer review process, as we expect PG&E to present procurement to its PRG in advance of filing its AL, of which ORA is a member, and modifications to this Resolution require PG&E to coordinate with CAISO to ensure the effectiveness of its portfolio to reducing or eliminating RMR obligation of any resource it procures. Should more time for review be desired or needed by the time that PG&E files its Advice Letter, ORA may make that request then.”⁵²

To the latter point in this excerpt from E-4909, we have received no requests for an extended review period for AL 5322-E.

General Rule 5.1 of General Order (GO) 96-B provides that: “A utility may also request relief by means of an advice letter where the utility: (1) has been authorized or required, by statute, by this General Order, or by other

⁵² Commission Resolution E-4909. January 11, 2018. Page 16.

Commission order, to seek the requested relief by means of an advice letter". Resolution E-4909 provided the directive to PG&E to file the contracts resulting from the solicitation authorized by the Resolution via Advice Letter. Further, as discussed earlier in this Resolution, we find that the procurement represented by AL 5322-E is consistent with the authorization granted in Commission Resolution E-4909. Finally, we note that the submittal of contracts via advice letter is explicitly provided for in Energy Industry Rules 5.3 and 7.1 of GO 96-B. Thus, we reject the protests of Calpine, ORA and CalCCA in this regard.

CEQA Review for Utility Owned Storage Project

We agree with PG&E's statement that the Moss Landing Energy Storage Project is governed by Commission General Order (G.O.) 131-D as it relates to permitting electric facilities in California. Additionally, batteries installed at substations are subject to the following Commission General Orders:

- G.O. 174, Rules for Electric Utility Substations.
- G.O. 173, Public Utilities Code Section 851 Advice Letters.

As determined by R.15-03-011 and ratified by D.17-04-039, the Commission's Safety and Enforcement Division (SED) monitors the safety of energy storage devices at utility-owned sites. During R.15-03-011, SED convened a working group consisting of California's major utilities, energy storage developers, codes and standards experts, and industry associations to advise and contribute to the development of a checklist for SED inspectors to use. G.O. 174, Section III, Inspection Programs, subsection 32.1 specifies that facilities subject to SED inspection shall include batteries.

G.O. 173 would be invoked when regulated utilities seek to transfer interest in utility property and must request Commission approval pursuant to Public Utilities Code section 851 for certain transactions valued at \$5 million or less (if the transaction exceeds \$5 million, the utility shall file an application).

Assembly Bill (AB) 546 sets expectations for consistent statewide standards to achieve timely, cost-effective installation of behind the meter customer-sited energy storage systems. It authorizes the Governor's Office of Planning and Research to provide guidance on energy storage permitting,

including streamlining, best practices, and potential factors for consideration by local governments in establishing fees for permitting and inspection.

In the spirit of AB 546, the CPUC intends to use the Moss Landing Sub Area projects as a test case to identify changes to Commission practices and procedures that may be necessary to support the cost effective deployment of utility-owned energy storage systems. A potential future outcome could result in developing streamlined guidance or pilot methods for processing siting/land use/permitting for other utility-owned battery energy storage systems.

The CPUC will retain jurisdictional authority over siting of battery energy storage systems to ensure that utilities are determining cost-effective solutions for ratepayers by siting systems closest to the local capacity deficit. In addition, to the extent that battery storage is a technical substitute for regulated assets such as transmission, CPUC reserves the right to assert its authority to regulate battery energy storage projects designed to reduce congestion or substitute for transmission projects by requiring a Certificate of Public Convenience and Necessity (CPCN) or Permit to Construct (PTC).

We disagree with PG&E's statement:

"Because G.O. 131-D does not require a CPCN, PTC, or NOC for energy storage projects, Commission approval and associated review by the Commission under the California Environmental Quality Act (CEQA) is not required for construction of the Moss Landing Energy Storage Project."

At the time G.O. 131-D was adopted by the Commission effective September 10, 1995, grid-connected battery energy storage systems supplying capacity of 182.5 megawatts were merely conceptual. CPUC streamlining of permit requirements for substation modifications was never intended to preclude evaluation of new environmental impacts caused by new technological advances. D.94-06-014 provided that a utility should be allowed to make additional modifications at an existing substation without requiring a permit to construct. The rationale was that the original substation development and construction had already created whatever impact on the environment that could occur.

At present, a categorical exemption from CEQA for battery energy storage systems does not exist within G.O. 131-D. Furthermore, a categorical exemption for battery energy storage systems does not exist within Title 14, California Code of Regulations, Chapter 3. Guidelines for Implementation of the California Environmental Quality Act, Article 19. Categorical Exemptions Sections 15300 to 15333.

The Moss Landing Project will be comprised of Tesla PowerPacks, a modular, fully integrated, pad-mounted battery energy storage system (BESS). The proposed project would construct battery packs for which the power transformers provide a high side voltage of 21kV. The BESS will be connected to a newly constructed PG&E-furnished medium-voltage (MV) switchgear building. PG&E will design and install the MV switchgear and all required equipment through the high-voltage (HV) interconnection point to the CAISO-controlled grid (including scope identified in the project specific CAISO Phase I interconnection study results for reliability network and local delivery network upgrades).

Accordingly, after analyzing G.O. 131-D for applicability to the PG&E project, the Commission concludes that the construction of the BESS could be understood as constituting construction of electric distribution line facilities (under 50 kV) that would not require the issuance of a CPCN or permit by this Commission. The Commission has up to this point declined to require a discretionary permit for activities that fall under G.O. 131-D Section III.C. Nonetheless, to ensure safety and compliance with local building standards, PG&E is required to first communicate with and obtain the input of local authorities regarding land use matters and obtain any non-discretionary local permits required for the construction and operation of these projects.

We agree with PG&E that because the BESS will be located within the coastal zone, a coastal development permit shall be obtained from the Coastal Commission as stated in G.O. 131-D section XV. We agree that G.O. 131-D Section XIV.B. mandates that PG&E consult with local agencies regarding land use matters. Although Section XIV.B states that local jurisdictions acting pursuant to local authority are preempted from regulating electric facilities constructed by public utilities, it is understood that Monterey County is the agency having jurisdiction authorized to inspect construction and installation of the energy storage system facilities

for compliance with California Building Code Section 608, UL 9540, National Fire Protection Association Standards, and other applicable codes and standards.

To facilitate the broader State policy objective to deploy energy storage systems and support utility procurement targets, the Commission in this instance is willing to acknowledge that Monterey County holds discretionary authority over the proposed project both because the County will act first, and because the Commission has declined to require a discretionary permit for project activities subject to G.O. 131-D, Section III.C. The Commission understands that this role confers on Monterey County the obligation to act as the Lead Agency with the primary responsibility for determining what level of CEQA review is required for the Tesla project and for preparing and approving the appropriate document [e.g., negative declaration (ND), mitigated negative declaration (MND), or Environmental Impact Report (EIR)]. Although the Commission is not requiring approval of a CPCN or PTC for this project and would not be issuing approval of the CEQA document, the Commission retains its jurisdiction with respect to electric facilities governed by G.O. 131-D and is prepared to enact its dispute resolution process in the event PG&E and the local agencies are unable to resolve differences regarding land use matters according to G.O. 131-D, Section XIV B. and C.

Based on these circumstances and the urgency imposed by Resolution E-4909, we agree to allow the project to go forward without requiring an Application for a CPCN or PTC but reserve the right to revisit G.O. 131-D applicability to battery energy storage systems or to open a new rulemaking. We require PG&E to provide the following:

- File a supplement to AL 5322-E within 30 days of the effective date of this Resolution, with a written statement with supporting documentation to justify why Moss Landing Substation battery energy storage system would not pose significant impacts to the environment.
- File a supplement to AL 5322-E when the following are available:
 - Document approved by the Lead Agency in compliance with CEQA Guidelines.
 - Results of the fire test on the newly configured battery.

- Evidence of review/concurrence for the site safety plan for commercial operations of the Tesla BESS from the North County Fire Protection District;
- If additional interconnecting facilities above 50kV are needed to deliver electricity at maximum build out of the battery energy storage systems, then PG&E shall file an Advice Letter pursuant to G.O. 131-D.
- If BESS project will require PG&E to grant an easement or otherwise encumber ratepayer assets, PG&E shall file an Advice Letter pursuant to G.O. 173.

Confidentiality

The Commission's Energy Division has conferred with both ORA and PG&E regarding ORA's request for non-confidential treatment of the total cost of the contracts proposed by AL 5322-E. The Commission is not compelled to make the costs public by this Resolution. ORA may appeal this decision to the ALJ Division, as provided in GO 96-B.

COMMENTS

Public Utilities Code section 311(g)(1) provides that this resolution must be served on all parties and subject to at least 30 days public review. The Energy Division is allowing for reply comments on this Resolution. Please note that comments are due 15 days from the mailing date of this resolution, and reply comments are due 5 days from the comment deadline. Section 311(g)(2) provides that this 30-day review period and overall 20-day comment period may be reduced or waived upon the stipulation of all parties in the proceeding.

The 30-day review and 20-day comment period for the draft of this resolution was neither waived nor reduced. Accordingly, this draft resolution was mailed to parties for comments, and will be placed on the Commission's agenda no earlier than 30 days from today.

FINDINGS

1. Resolution E-4909 authorized PG&E to procure energy storage and preferred resources to reduce or eliminate capacity deficiencies and a voltage issue in three subareas, caused by the potential retirement of three gas-fired power plants – the Feather River, Yuba City and Metcalf Energy Centers.
2. The CAISO approved \$14 million in transmission upgrades in its 2017-2018 transmission plan to reduce the capacity obligation in the South Bay Moss Landing subarea by 400 – 600 MWs.
3. The CAISO-approved upgrades eliminate the original deficiency caused by Metcalf.
4. Most gas fired generation in the South Bay Moss Landing subarea will no longer be under contract as early as 2019.
5. At least one plant – the Gilroy Cogen plant – serving the South Bay Moss Landing subarea has signaled possible retirement with a letter to the CAISO.
6. The CEC forecast, and CAISO local capacity technical study, shows an increase of 324 MWs of local capacity need in the South Bay Moss Landing subarea in 2023 over prior projections.
7. Lack of long-term contractual commitments, and an increase in projected capacity need in the South Bay Moss Landing subarea, recreate the conditions for possible exercise of market power, potentially creating the need to extend the Metcalf RMR agreement.
8. PG&E AL 5322-E is consistent with the procurement directive of Commission Resolution E-4909, and the Advice Letter and Resolution process is an appropriate approval mechanism.
9. PG&E's consultation with the CAISO meets the requirements of Resolution E-4909.
10. PG&E AL 5322-E is consistent with the Energy Storage Procurement Framework and Design Program and PG&E has outstanding procurement obligations under that framework
11. PG&E's evaluation methodology is reasonable and consistent with prior energy storage solicitations.
12. The evaluation methodology calculated greater benefits than costs for the four projects selected by PG&E, and filed in AL 5322-E.

13. The projects in AL 5322-E provide greater value to ratepayers than these other procurement options.
14. The cost of the four storage agreements under AL 5322-E are reasonable in comparison to prior storage solicitations.
15. PG&E's requests for cost recovery of all agreements are reasonable.
16. Ongoing and future local reliability concerns warrant CAM treatment of this storage procurement from the third-party owned storage contracts.
17. It is reasonable to require PG&E to file an application for reasonableness review of the utility-owned Moss Landing Energy Storage Project within 90 days after its operational start date.
18. The four storage agreements meet the criteria for local resource adequacy in the South Bay and Moss Landing subarea.
19. It is reasonable to find that the utility owned Moss Landing Energy Storage Project is governed by Commission General Order (G.O.) 131-D as it relates to permitting electric facilities in California.
20. It is not reasonable to find that battery energy storage systems are exempt from CEQA, as no categorical exemption exists in current law.
21. It is reasonable to treat the Moss Landing Project as constituting construction of electric distribution line facilities (under 50 kV) that would not require the issuance of a CPCN or permit by this Commission.
22. It is reasonable for the Commission to acknowledge that Monterey County holds discretionary authority over the project because the Commission has declined to require a discretionary permit for project activities subject to G.O. 131-D, Section III.C.

THEREFORE IT IS ORDERED THAT

1. The request of PG&E to approve the four storage agreements resulting from PG&E's local subarea RFO, as submitted in AL 5322-E, is approved.
2. AL 5322-E is approved and the relief requested is granted.
3. PG&E is required to count the procurement in AL 5322-E against its outstanding energy storage procurement obligation.
4. PG&E's storage procurement qualifies for local capacity credits for the South Bay Moss Landing subarea.

5. PG&E's requests for cost recovery for both the third party and utility owned agreements are approved.
6. PG&E is required to file an application for reasonableness review of the utility-owned Moss Landing Energy Storage Project within 90 days after their operational start date.
7. The Moss Landing Energy Storage Project is governed by Commission General Order (G.O.) 131-D.
8. A CPCN or permit from the Commission is not required for the Moss Landing Energy Storage Project.
9. PG&E to provide the following information to the Commission's Energy Division:
 - a. File a supplement to AL 5322-E within 30 days of the effective date of this Resolution, with a written statement with supporting documentation to justify why Moss Landing Substation battery energy storage system would not pose significant impacts to the environment.
 - b. File a supplement to AL 5322-E when the following are available:
 - i. Document approved by the Lead Agency in compliance with CEQA Guidelines.
 - ii. Results of the fire test on the newly configured battery.
 - iii. Evidence of review/concurrence for the site safety plan for commercial operations of the Tesla BESS from the North County Fire Protection District;
 - c. If additional interconnecting facilities above 50kV are needed to deliver electricity at maximum build out of the battery energy storage systems, then PG&E shall file an Advice Letter pursuant to G.O. 131-D.
 - d. If BESS project will require PG&E to grant an easement or otherwise encumber ratepayer assets, PG&E shall file an Advice Letter pursuant to G.O. 173.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on October 25, 2018; the following Commissioners voting favorably thereon:

ALICE STEBBINS
Executive Director

Confidential Appendix A

Confidential Appendices to PG&E AL 5322-E:

- Appendix G: Summary of Key 3rd Party Owned Contract Terms
- Appendix H: Summary of Key EPC And LTPMA Contract Terms

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Appendix B

Appendices to PG&E AL 5322-E:

- Appendix J: CAISO Letter to PG&E Regarding Energy Storage - Projects From LSA RFO
- Appendix K: Planned Transmission Projects

PACIFIC GAS AND ELECTRIC COMPANY

APPENDIX J

CAISO LETTER TO PG&E REGARDING ENERGY STORAGE

PROJECTS FROM LSA RFO



California Independent System Operator

Keith E. Casey, Ph.D.
Vice President, Market & Infrastructure Development

May 21, 2018

Mr. Fong Wan
SVP, Energy Policy & Procurement
Pacific Gas & Electric Company
77 Beale Street B32
San Francisco, CA 94105

Dear Mr. Wan:

Through Resolution E-4909 (Resolution) issued on January 12, 2018, the California Public Utilities Commission (CPUC) ordered Pacific Gas and Electric Company (PG&E) to hold a competitive solicitation for energy storage and preferred resources to address two local sub-area deficiencies and to manage voltage issues in another sub-area.

The Resolution was largely in response to the ISO designating the Metcalf Energy Center, the Yuba City Energy Center and the Feather River Energy Center as reliability must-run resources, addressing the South Bay-Moss Landing sub-area deficiencies, the Pease sub-area deficiencies, and the Bogue area voltage control issues, respectively. The Resolution directed PG&E to "coordinate with the CAISO in an effort to ensure that its proposed portfolio will contribute to reducing or eliminating the local sub-area deficiencies in the Pease and South Bay-Moss Landing subareas and high voltage in the Bogue subarea."

Since the CPUC issued the Resolution, the ISO finalized its 2017-2018 Transmission Plan, which identified mitigations either already underway or approved in the plan to address the specific needs that led to the reliability must-run designations. These mitigations consist of transmission upgrades which are expected to be in place for 2019 in the South Bay-Moss Landing area, but are still several years away from completion in the case of Pease and Bogue sub-areas.

The ISO supports the procurement of storage as a general matter and recognizes that energy storage can reduce the risk of future local capacity deficiencies in the event of generation retirement, especially in the South Bay-Moss landing sub-area. Beyond the local area needs, increasing storage capacity on the grid will provide flexible resources that can contribute to meeting the ever-growing ramping requirements on the ISO system, triggered by the growing fleet of grid-connected and behind-the-meter solar PV generation.

The ISO further notes that the Resolution anticipates that storage procured by PG&E in response to the Resolution will contribute to PG&E's overall storage mandate.

We look forward to working with PG&E in the future to validate the effectiveness of the resources ultimately procured, taking into account the location and volume of the resources given the characteristics necessary to meet local capacity needs and the changes to those characteristics as more preferred resources are relied upon.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Keith Casey', with a horizontal line extending to the right.

Keith E. Casey, Ph.D.
Vice President
Market & Infrastructure Development

KEC/ds

PACIFIC GAS AND ELECTRIC COMPANY
APPENDIX K
PLANNED TRANSMISSION PROJECTS

Appendix K: Planned Transmission Projects

South Bay-Moss Landing Sub-Area

PG&E is implementing the following transmission projects in the South Bay Moss Landing sub area:

1. Monta Vista-Ames 115 kV Path Closing
2. San Jose 'B'-Trimble 115 kV Line Limiting Facility Upgrade
3. San Jose 'B'-Trimble 115 kV Line Series Reactor
4. Moss Landing-Panoche 230 kV Path Upgrade

The Monta Vista-Ames 115 kilovolt (kV) Path project will reconnect the 115 kV lines from Mountain View and Whisman Substations into the 115 kV bus at Ames Substation. This project in effect will create another path for electric power to support the local sub-area particularly during emergency conditions. This project is part of the revised scope of the South of San Mateo Capacity Increase which was re-assessed by the CAISO as part of the 2017-2018 Transmission Planning Process (TPP)¹. Design for this project is currently underway and the project is expected to be placed into service by February 2019.

The San Jose 'B'-Trimble 115 kV Line Limiting Facility Upgrade project will re-rate the San Jose 'B'-Trimble 115 kV Line to 4 ft/sec wind speed assumptions as well as upgrade any limiting substation equipment to achieve a summer emergency rating of 189 mega-volt ampere (MVA) in order to increase the load serving capability of the circuit. This project was identified and approved by the CAISO as part of the 2017-2018 TPP as a reliability upgrade².

The San Jose 'B'-Trimble 115 kV Line Series Reactor project will install a 4-ohm series reactor at Trimble Substation on the termination of the Trimble – San Jose B 115 kV Line and upgrade line termination equipment and protection equipment at both Trimble and San Jose B Substations. Installation of the series reactor reduces the potential overload on this line during the identified emergency conditions. This project was approved by the CAISO as part of the 2017-2018 TPP as an economically driven upgrade³.

Design and procurement of material for the two above projects on the San Jose 'B'-Trimble 115 kV Line and associated substations is currently underway and the projects are expected to be placed into service by February 2019.

¹ California ISO 2017-2018 Transmission Plan, Reliability Assessment section, Page 126, [http://www.caiso.com/Documents/BoardApproved-2017-2018_Transmission_Plan.pdf].

² California ISO 2017-2018 Transmission Plan, Transmission Project List section, Table 7.2-1, item 5, Page 334, [http://www.caiso.com/Documents/BoardApproved-2017-2018_Transmission_Plan.pdf].

³ California ISO 2017-2018 Transmission Plan, Transmission Project List section, Table 7.2-3, item 1, Page 335, [http://www.caiso.com/Documents/BoardApproved-2017-2018_Transmission_Plan.pdf].

The Moss Landing-Panoche 230 kV Path Upgrade project will upgrade limiting substation equipment at Panoche and Coburn Substations and re-rate the five 230 kV lines from Moss Landing to Panoche to have a 4 ft/sec wind speed emergency rating of at least 400 MVA rating. These upgrades and re-rates mitigate the constraint identified by the CAISO on the Moss Landing-Las Aguilas 230 kV line and enables further import capability on this path during emergency conditions⁴. This project was identified and approved by the CAISO as part of the 2017-2018 TPP as an economically driven upgrade⁵. Design for this project is currently underway and the project is expected to be placed into service by December 2018.

The CAISO as part of its 2019 LCR analysis⁶ shows that as PG&E completes the projects, the LCR need in the sub-area will be reduced by 568 MW.

Pease Sub-Area

PG&E is implementing two transmission projects in the Pease sub area:

1. South of Palermo 115 kV Power Line Reinforcement (South of Palermo)
2. Pease 115/60 kV Transformer Addition

The South of Palermo project is a multi-segment effort to replace or upgrade conductor and structures along approximately 59.5 miles of line in Butte, Yuba, and Sutter counties. It was identified in the 2010-11 CAISO transmission plan and confirmed, after re-study, in the 2015 CAISO transmission plan as necessary for increased service reliability⁷. The Commission granted a permit to construct the South of Palermo Project⁸ and construction is expected to begin in July 2018.

The Pease 115/60 kV Transformer Addition project will install a new 115/60 kV transformer rated at 200 MVA at Pease Substation and will also reconfigure the Pease 115 kV Bus to breaker and a half (BAAH) configuration. The project need for reliability and operational flexibility was reconfirmed in the CAISO 2017-2018 TPP⁹.

Bogue Sub-Area

⁴ California ISO 2017-2018 Transmission Plan, Economic Planning Study section 4.9.4 South Bay-Moss Landing Sub-area Local Capacity Requirements, Summary of Results discussion, Page 262, [http://www.caiso.com/Documents/BoardApproved-2017-2018_Transmission_Plan.pdf].

⁵ California ISO 2017-2018 Transmission Plan, Transmission Project List section, Table 7.2-3, item 2, Page 335, [http://www.caiso.com/Documents/BoardApproved-2017-2018_Transmission_Plan.pdf].

⁶ CAISO, 2019 Local Capacity Technical Analysis Final Report (the 2019 LCR Report), South Bay-Moss Landing Sub-area section IV, page 42, [<http://www.caiso.com/Documents/Final2019LocalCapacityTechnicalReport.pdf>].

⁷ California ISO 2017-2018 Transmission Plan, Reliability Assessment section, Page 83 and Transmission Project List section, Table 7.2-1, item 14, Page 332, [http://www.caiso.com/Documents/BoardApproved-2017-2018_Transmission_Plan.pdf].

⁸ See D.18-05-014.

⁹ California ISO 2017-2018 Transmission Plan, Reliability Assessment section, Page 117,

PG&E is implementing two transmission projects in the Bogue sub area:

The Rio Oso 230/115 kV Transformer Upgrade project will replace the existing 230/115 kV Transformer Nos. 1 and 2 with two new 420 MVA, 230/115 kV three-phase, load-tap- changer (LTC) transformers at Rio Oso Substation. The project need was reconfirmed in the CAISO 2017-2018 TPP¹⁰.

The Rio Oso Area 230 kV Voltage Support involves installing a +200/-260 MVA Static Var Compensator (SVC) at Rio Oso 230 kV bus. As with the transformer project, the need for this project was validated by the CAISO as part of the 2017-2018 TPP¹¹. Construction of both of these projects will be coordinated with other work at Rio Oso Substation and are expected to be put in-service by June 2022.

¹⁰ California ISO 2017-2018 Transmission Plan, Transmission Project List section, Table 7.1-1, item 58, Page 328, [http://www.caiso.com/Documents/BoardApproved-2017-2018_Transmission_Plan.pdf].

¹¹ California ISO 2017-2018 Transmission Plan, Reliability Assessment section, Page 118, and

¹⁰ California ISO 2017-2018 Transmission Plan, Transmission Project List section, Table 7.1-1, item 58, Page 328, [http://www.caiso.com/Documents/BoardApproved-2017-2018_Transmission_Plan.pdf].

¹¹ California ISO 2017-2018 Transmission Plan, Reliability Assessment section, Page 118, and Transmission Project List section, Table 7.1-1, item 59, Page 328