

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

ITEM # 10 (Rev. 2)

AGENDA ID: 16868

ENERGY DIVISION

RESOLUTION E-4949

November 8, 2018

R E D A C T E D R E S O L U T I O N

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 estimated cost of these four projects is confidential at this time. The total revenue requirement for 2021 and 2022 for the Moss Landing project is \$80.248 million. The revenue requirement is \$41.204 million in 2021, and \$39.044 million in 2022.

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> |
|----------------------------------|-------------------|--------------------|-------------------|-----------------|-------------------------|----------------------|-------------------------|------------|
| Dynegy | 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.

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 Resolution E-4909, Ordering Paragraph 15.

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.

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.
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 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.

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#P63_3094

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 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

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

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:

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;

⁵ At the time of issuing this Resolution, ORA's name has changed to the Public Advocate's Office (CALPA).

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.

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.

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 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

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.

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

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

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

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.

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.

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

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

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.

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.

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 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

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.

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.

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.

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

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.

considerations of alternatives, to the potential detriment of PG&E's customers."³⁵

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

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.

³⁶ Ibid. Page 4.

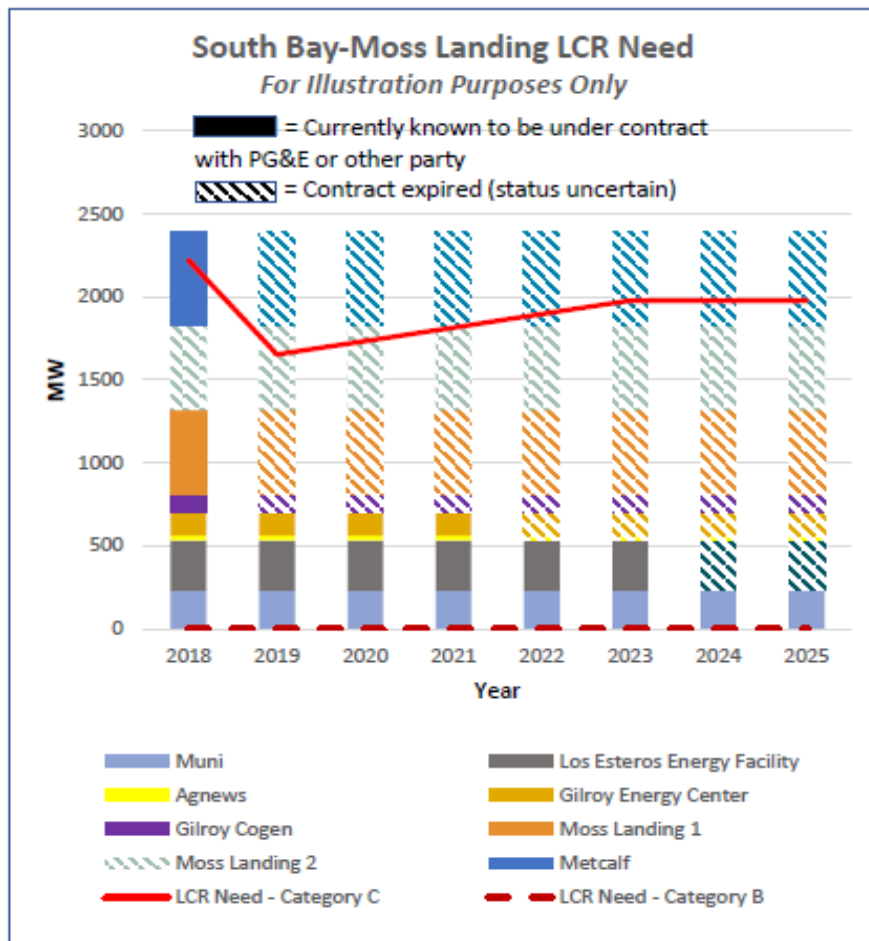
³⁷ Pacific Gas and Electric Company's Reply to Protests of Advice Letter 5322-E for Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers Per Resolution E-4909. July 26, 2018. Page 7.

³⁸ Ibid. Page 4.

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

reply, which shows the current stack of generating resources that serve the South-Bay Moss Landing subarea.⁴⁰

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.

⁴⁰ Ibid. Page 5.

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 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 –

⁴¹ Ibid. Page 10.

⁴² Ibid. Page 8.

⁴³ Ibid. Page 9.

⁴⁴ Ibid. Page 8.

⁴⁵ Ibid. Pages 12 – 13.

⁴⁶ Ibid. Pages 13 – 14.

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.

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

⁴⁷ Ibid. Pages 14 – 15.

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 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.

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.

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 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 MWs 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 analysis agreed with PG&E that, using its portfolio adjusted value analysis, the projects in AL 5322-E

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

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 each of the agreements in AL 5322-E. Should the costs projected for the utility-owned Moss Landing Energy Storage Project exceed those projected by PG&E in AL 5322_E, we direct PG&E to file an application for reasonableness review of the 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 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.

While we reasonably expect the charging and discharging behavior of the projects in AL 5322-E to have a net positive GHG impact, we acknowledge that we have not yet established a methodology or requirement to track GHG emissions from storage projects. We require PG&E to annually file a report with the Energy Division indicating the GHG impact of this procurement each year, starting one year after the first project comes on-line. Projects shall be added to the report once they have achieved one full year of commercial operation.

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."⁵¹

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 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.

⁵¹ Commission Resolution E-4909. January 11, 2018. Page 16.

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 (Chiu, 2017) 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 retains 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.

The Moss Landing Energy Storage 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).

We agree with PG&E that because the BESS will be located within the coastal zone, a coastal development permit should be obtained from Monterey County, exercising state-delegated power granted by 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. Because the project requires a coastal development permit, Monterey County will be issuing a discretionary permit for the project through its state-delegated powers under the California Coastal Act. 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.

Additionally, should the PG&E Moss Landing Energy Storage Project become modified through the course of Monterey County's CEQA review process, the CPUC retains the right to its jurisdiction over the regulation of electric facilities to conduct additional review or take additional measures.

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:

- Submit the following documents as compliance filing to Energy Division Central Files⁵² 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 BESS project will require PG&E to grant an easement or otherwise encumber ratepayer assets in a manner not otherwise covered by G.O. 69-C, "Easements of Property of Public Utilities", PG&E shall file an Advice Letter pursuant to G.O. 173.

⁵² Per instructions communicated in the May 26, 2016 letter addressed to the Director, Regulatory Relations, from the Commission's Director, Energy Division. The compliance filing should be emailed to ED Central Files at EnergyDivisionCentralFiles@cpuc.ca.gov.

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. We do include Confidential Appendix I to PG&E AL 5322-E in the Confidential version of this Resolution. We also include, the revenue requirement for the first two years for the storage project that PG&E proposes to own. As is articulated on Page 21 of AL 5322-E, the total revenue requirement for 2021 and 2022 for the Moss Landing project is \$80.248 million. The revenue requirement is \$41.204 million in 2021, and \$39.044 million in 2022.

COMMENTS

Comments were filed on October 10th and replies were filed on October 15th. Comments were timely filed by Independent Energy Producers Association (IEPA), NRG, Calpine, Public Advocates Office (CALPA), Shell Energy North America, CalCCA, California Energy Storage Association (CESA), Center for Energy Efficiency and Renewable Technologies (CEERT), and Pacific Gas and Electric Company (PG&E). Reply comments were timely filed by CESA and PG&E.

Procurement is Not Needed

IEP, CalCCA and Shell Energy North America comment that the 567.5 MWs of energy storage procurement represented by AL 5322-E will not alleviate the local reliability need(s) which was the focus of Resolution E-4909. These parties comment that the CAISO's approval of \$14 million in transmission upgrades to serve the South Bay Moss Landing subarea alleviates the need which the Resolution was designed to address. On the other side, CESA supports the finding in this draft Resolution that the transmission solutions approved in the CAISO's 2017-2018 TPP address an immediate, but not long term, need for capacity in the South Bay Moss Landing subarea. CESA agrees that the subarea is capacity constrained and there is little margin, coupled with uncertain future generation retirements.

This argument was raised by parties in protest to AL 5322-E, as detailed earlier in this Resolution. The draft Resolution rejected these arguments and, though parties raise it here again, they do so without new evidence. Thus, we do not make associated modifications to this draft Resolution.

Projects May Not be Eligible for Local Reliability

Calpine, NRG and CALPA all comment that there is no evidence that 4-hour batteries are sufficient to address the possible future reliability need in the South Bay Moss Landing subarea. Calpine and NRG point to the example of Southern California Edison (SCE)'s ongoing procurement to address reliability in the Moorpark subarea, wherein any storage would be required to have dispatch durations of nine hours.

In reply, PG&E points out that the projects' four-hour duration is consistent with current reliability requirements, and that the projects' location and duration are consistent with the criteria used by the CAISO for local reliability. In reply comments, CESA states that, while the underlying duration need is important, the procurement will meet the requirement of Resolution E-4909 of partially or wholly obviating the need for RMR contracts or their extension. CESA points to the description of PG&E's interaction with the CAISO and that it meets the requirements of Resolution E-4909.

As we found in the draft Resolution circulated for comment, we find that PG&E's interactions with the CAISO meet the requirements of E-4909 and do not make changes to this Resolution. We agree that, while it is true that use limited resources of durations different than the long-standing four-hour requirement may be needed in certain subareas, such a finding has not yet been made for the South Bay Moss Landing subarea and current requirements remain. We reiterate the finding that the procurement represented in AL 5322-E meets these requirements, as they stand today, and do not modify this Resolution.

Proposed Procurement Inconsistent with Resolution E-4909, Commission Policy and GO 96-B

CALPA, Calpine, NRG and CalCCA all comment that the proposed procurement represented by PG&E AL 5322-E is inconsistent with the directives of Resolution E-4909 and General Order 96-B, and thus should be resubmitted in

an Application. We note that these arguments are not new, were raised in protests to AL 5322-E and were rejected in the draft Resolution. The comments do not offer new evidence or arguments and thus we do not modify this Resolution.

IEP, NRG and Calpine all comment that the EPC contract for the 182.5 MW Moss Landing project is not justified by either Commission policy or a reliability need and should be denied. IEP argues that, should the Commission determine that the projects are needed, then the EPC contract should be denied and the third-party contracts approved. PG&E replies both that there is no logical basis that the utility-owned Moss Landing project should be rejected by the Commission, and that Resolution E-4909 did not preclude utility owned assets. Indeed, nothing in Resolution E-4909 precludes the proposal of utility owned storage assets. There is no basis in Resolution E-4909 or Commission policy for rejecting the proposed 182.5 MW utility owned project and thus we make no changes to this Resolution.

Projects Will Not Mitigate Local Market Power

NRG, Calpine⁵³, Shell Energy North America and CalCCA all claim that the argument presented in the draft Resolution regarding procurement of the Projects to mitigate local market power is unfounded. NRG states that two suppliers, Calpine and Vistra, are currently pivotal in the South Bay Moss Landing subarea and will remain so if the Draft Resolution is adopted.⁵⁴ Shell Energy North America⁵⁵ and CalCCA⁵⁶ raise the point that the concerns over local market power are being addressed in the RA proceeding with consideration of possible future multi-year forward procurement obligation. PG&E replied that the procurement and Resolution are focused on addressing market power by any single facility, rather than supplier, as these parties assert, and that its storage procurement in AL 5322-E would change the supply stack serving the South Bay Moss Landing subarea helps to mitigate the reliability risk

⁵³ Comments of Calpine Corporation on Draft Resolution E-4949. October 10, 2018. Page 10.

⁵⁴ NRG Energy, Inc. Comments on Draft Resolution E-4949. October 10, 2018. Page 4.

⁵⁵ Draft Resolution E-4949: Opening Comments of Shell Energy North America (US), L.P. October 10, 2018. Page 10.

⁵⁶ Comments of CalCCA on Draft Resolution E-4949 Of the Energy Division, Issued in Response to Pacific Gas and Electric Company's Advice Letter 5322-E (Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers Per Resolution E-4909). October 10, 2018. Page 4.

that would be caused by other conventional resources proposing to retire in the subarea.

We clarify that our concern lies with the ability of any single facility to propose retirement and create the need for backstop procurement in the subarea. Indeed, as stated earlier in this Resolution, we are concerned with the *contracting position of the majority of the gas fired resources serving the South Bay – Moss Landing subarea*. The procurement in AL 5322-E do mitigate, but do not eliminate, this concern. Resolution E-4909, PG&E's procurement and AL 5322-E, and this Resolution are all focused on this subarea, as there is a reliability need in the very short term for which there was no existing process. Energy Division will monitor the operations of these four projects to ensure that they meet the intended objective of this procurement and Resolution, on behalf of the Commission, and will report back as needed.

Procurement Will Cause PG&E to Exceed its AB 2514 Storage Procurement Requirement

Calpine comments that the procurement in AL 5322-E will put PG&E in excess of its storage procurement requirement, first directed by AB 2514 (Skinner, 2010) and established in Decision 13-10-040, and several years ahead of the 2020 procurement deadline.⁵⁷ CESA replies that PG&E has demonstrated that there is benefit to the projects irrespective of a compliance need, and the fact that the projects will meet a portion of PG&E's energy storage requirement is an additional benefit.⁵⁸ The draft Resolution recognized the fact that this procurement puts PG&E in excess of its storage procurement requirements, and took no issue with this fact. The Commission has allowed IOUs to procure storage in excess of the procurement targets established in D.13-10-040, to meet reliability needs. Indeed, both SCE and SDG&E have procured storage in excess of their requirements in one or more domains, and the Commission has approved that procurement. The targets established in D.13-10-040 were intended to drive the storage market, and not pace it, as Calpine appears to suggest. We are not moved by Calpine raising this point and make no

⁵⁷ Comments of Calpine Corporation on Draft Resolution E-4949. October 10, 2018. Page 12.

⁵⁸ Reply Comments of the California Energy Storage Alliance to Draft 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. October 15, 2018. Pages 2-3.

modification to this Resolution.

Economic and Environmental Benefits of Projects are Questionable

Both Calpine and NRG challenge the economic analysis of the projects. NRG argues that the claim of \$211/kW-year of overall benefit to ratepayers resulting from projects in AL 5322-E is not justified. NRG focused its arguments on the cost of the Metcalf RMR contract and the CAISO-approved transmission upgrades, and the possibility that the 567.5 MW procurement may not indeed replace gas generation.⁵⁹ Calpine points to the benefit categories and estimates that the flexible RA benefits are overstated and asserts that the comparison to an escalating Metcalf RMR price is not the appropriate comparison.⁶⁰

CEERT supports the draft Resolution and contends that the potential benefits of the procurement exceed those represented by Resolution E-4949, as it represents opportunity to demonstrate value stacking of the storage procurement beyond meeting local capacity needs.⁶¹

In reply, PG&E defends its analysis as appropriate. PG&E states that both Calpine and NRG's claims focus entirely on the costs and not the benefits of the projects. PG&E includes its methodology, wherein the costs of the RMR agreement and the storage agreements were subtracted from their respective values, giving a net benefit value for each. Using the methodology, the net costs were subtracted from net benefits, offering a positive benefit value.⁶² PG&E also points out that it used avoidance of the CAISO's backstop Capacity Procurement Mechanism (CPM) to estimate the benefits of the Metcalf RMR agreement, and the CPM price is a reasonable basis of comparison as it represents the price likely to be paid to generators in the South Bay – Moss Landing subarea to avoid their retirement.

As detailed earlier in this Resolution, we have evaluated PG&E's cost benefit

⁵⁹ NRG Energy, Inc. Comments on Draft Resolution E-4949. October 10, 2018. Page 6.

⁶⁰ Comments of Calpine Corporation on Draft Resolution E-4949. October 10, 2018. Page 12.

⁶¹ DRAFT RESOLUTION E-4949 (PG&E Energy Storage PPAs) COMMENTS OF THE CENTER FOR ENERGY EFFICIENCY AND RENEWABLE TECHNOLOGIES (CEERT). October 10, 2018. Page 2.

⁶² Pacific Gas and Electric Company's Reply to Comments on Draft Resolution E-4949. October 15, 2018. Pages 7-9.

analysis of its procurement and find it to be reasonable. We do not make any changes to this Resolution on this issue.

CALPA comments that there is no evidence that the procurement represented by AL 5322-E will reduce greenhouse gas (GHG) emissions, and in fact may increase them. As evidence, CALPA points to an analysis conducted by Itron, which found a net increase in GHG emissions resulting from operation of storage systems funded under the Self Generation Incentive Program (SGIP) program. Both Calpine and NRG also comment that the GHG benefit of this procurement has not yet been clearly demonstrated. CESA replies to this comment and points out that storage located in front of the utility meter (IFOM) is subject to a must offer obligation in the wholesale market, and must be available during periods of greatest need, and is incentivized to charge during periods with low wholesale market prices and, generally, also low GHG emission rates.

Resources funded under the SGIP program, which are the subject of the Itron analysis, are entirely behind the utility meter, whereas all but 10 MWs of PG&E's proposed procurement is IFOM. Thus, the findings of the Itron report are not directly relevant here. It can reasonably be expected that the charging and discharging behavior of IFOM storage will not increase net GHG emissions. That said, the Commission has not yet sponsored nor required an analysis of the actual GHG impact of IFOM energy storage systems, and we are cognizant of the concerns raised by CalPA with regard to the 10 MW behind the meter contract with mNOC. We make several edits to this Resolution – first, to remove reference to the overall GHG benefits of the procurement and second, we require PG&E to report annually on the estimated GHG impact of the portfolio of projects in AL 5322-E.

Cost Recovery via the Cost Allocation Mechanism

Calpine⁶³ and CalCCA⁶⁴ all comment that it is inappropriate to grant cost recovery for the agreements via the CAM because doing so would unfairly

⁶³ Comments of Calpine Corporation on Draft Resolution E-4949. October 10, 2018. Page 13.

⁶⁴ Comments of CalCCA on Draft Resolution E-4949 Of the Energy Division, Issued in Response to Pacific Gas and Electric Company's Advice Letter 5322-E (Energy Storage Contracts Resulting from PG&E's Local Sub-Area Request for Offers Per Resolution E-4909). October 10, 2018. Pages 6 & 7.

burden CCA and Direct Access customers with excessive costs and inhibit their ability to procure their own resources to address local reliability.

On the other side, PG&E comments that the Resolution is internally inconsistent in approving cost recovery via CAM for the three third party owned agreements, while requiring after the fact reasonableness review for its proposed utility-owned Moss Landing project. PG&E advises that Commission look to the precedent established by SDG&E's procurement of utility owned storage resources to address Aliso Canyon, with SDG&E AL 2924-E, and Resolution E-4798, rather than the precedent established with SCE's procurement.

We modify this Resolution to approve cost recovery for all four projects. However, should the costs of the utility owned Moss Landing project exceed the costs that PG&E projected in AL 5322-E, we require PG&E to file an Application for after the fact reasonableness review within 90 days of operational start date.

Revisions are Needed to the CEQA Section of Resolution

PG&E states several concerns with the language of the Resolution surrounding CEQA compliance for Moss Landing, as inconsistent with GO 131-D. PG&E points to Section III.C of GO 131-D which states that any work falling within that section does not require a CPCN from the CPUC nor discretionary permits or approvals from local governments, and to the Commission's determination in SCE's Aliso Canyon case that no discretionary permits were needed from the CPUC or any other agency. The Draft Resolution states that no categorical exemption for battery storage exists in GO 131-D. PG&E clarifies that, even so, this does not mean that the facilities could not be found to be categorically exempt under CEQA guidelines. Finally, PG&E confirms that Monterey County is the lead agency, as acknowledged in the draft Resolution. Since Monterey County is undertaking CEQA review, as the lead agency, PG&E comments that it is not appropriate for the Commission to require a separate environmental review as required by the draft Resolution.

Several modifications have been made to this Resolution to address these points.

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.
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, if the actual costs of the project exceed the cost estimate contained within AL 5322-E.
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 require PG&E to report annually on the estimated GHG emissions impact of all four projects.
20. 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.
21. It is reasonable for the Commission to acknowledge that Monterey County, which has jurisdiction over coastal resources delegated by the California Coastal Commission, will be Lead Agency for CEQA review because the project requires a coastal development permit. Monterey County, as Lead Agency for CEQA review, will determine the level of CEQA review required.

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, if the actual costs of the project exceed the costs projected in AL 5322-E.
7. PG&E is required to submit to the Energy Division a report estimating the GHG impact from operations of all four projects, each year, starting one year from the operational date of the first project online. Projects must be added to the report once they achieve a full year of commercial operation.

8. The Moss Landing Energy Storage Project is governed by Commission General Order (G.O.) 131-D.
9. A CPCN or permit from the Commission is not required for the Moss Landing Energy Storage Project.
10. PG&E shall provide the following documents:
 - a. By compliance filing to the Commission's Energy Division Central Files:
 - 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;
10. Commission staff shall review the documents identified in Ordering Paragraph 9.a.ii and 9.a.iii to verify compliance with applicable codes, standards and regulations.

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 November 8, 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
- Appendix I: Utility Ownership Costs for Moss Landing

PACIFIC GAS AND ELECTRIC COMPANY
APPENDIX G
SUMMARY OF KEY 3RD-PARTY OWNED CONTRACT TERMS

(CONFIDENTIAL)

PACIFIC GAS AND ELECTRIC COMPANY
APPENDIX H
SUMMARY OF KEY EPC AND LTPMA CONTRACT TERMS

(CONFIDENTIAL)

PACIFIC GAS AND ELECTRIC COMPANY
APPENDIX I
UTILITY OWNERSHIP COSTS FOR MOSS LANDING PROJECT

(CONFIDENTIAL)

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