

**COMMENTS OF THE STAFF OF THE CALIFORNIA  
PUBLIC UTILITIES COMMISSION  
REGARDING THE 2019-2020 TRANSMISSION PLANNING PROCESS RELIABILITY  
ASSESSMENT AND STUDY UPDATES FOLLOWING THE SEPTEMBER 25-26, 2019  
STAKEHOLDER MEETING**

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**October 10, 2019**

The Staff of the California Public Utilities Commission (“CPUC Staff”) appreciates this opportunity to provide comments on the 2019-2020 Transmission Planning Process Reliability Assessment and Study Updates discussed at the California Independent System Operator Corporation’s (CAISO) September 26-27, 2019 stakeholder meeting. Our comments address the following areas:

- The CPUC appreciates the CAISO’s assessment of on-hold projects and requests further updates on several projects.
- The CPUC suggests recommendations for the treatment of energy storage and other low-cost Distributed Energy Resources (DERs).
- The CPUC requests project specific clarifications and/or proposes recommendations for Energy Storage to be considered as part of reliability solutions identified in this year’s cycle.

**I. The CPUC appreciates the CAISO’s assessment of on-hold projects and requests further updates on several projects.**

As indicated in previous ISO cycles, Energy Division CEQA Unit staff is interested in potential regulated utility application filings that trigger compliance with the California Environmental Quality Act environmental document preparation.

- The CPUC staff appreciates the CAISO providing specific assessment outcomes in their 2018/2019 TPP for the New Bridgeville-Garberville #2 115 kV line, Atlantic-Placer 115 kV line, Gates-Gregg 230 kV line, Jefferson-Stanford #2 60kV line, and the Bellota-Warnerville 230 kV reconductoring project. All have been cancelled, except for Bellota-Warnerville, which we expect to be filed at the CPUC by PG&E in Q1 2020. However, the CEQA Unit staff is still interested in any further assessments for the Midway-Andrew project which has been renamed the North of Mesa Upgrade and remains on hold.
- Northern Oakland Area Reinforcement Project in PG&E’s Request Window Proposals will have permitting and construction challenges. The CEQA Unit staff will be interested in the further discussions and assessments of this project as it has number of siting issues such as traversing residential areas, crossing Tier 2 and 3 High Fire threat District areas, and rebuilding transmission structures.

**II. The CPUC suggests recommendations for the treatment of energy storage and other low-cost Distributed Energy Resources (DERs)**

CPUC staff provide recommendations for the treatment of energy storage and other low-cost Distributed Energy Resources (DERs) in the CAISO Transmission Planning Process (TPP). To illustrate these recommendations, CPUC staff provides examples relevant to the CAISO’s current consideration of energy storage in its preliminary reliability assessments reviewed in the CAISO TPP

stakeholder meetings this September 25-26, 2019 and options to consider energy storage and other DERs as this cycle continues.

### **1. Consider Energy Storage or other low-cost DER solutions for all Reliability Issues**

CPUC staff recommends that the CAISO, consistent with its Comprehensive Transmission Planning Process (TPP) Tariff, consider energy storage and other “non-wires alternatives” (NWAs) as solutions for identified reliability issues.

Per Section 24.4.6.2 Reliability Driven Solutions of the CAISO Tariff, the CAISO, in coordination with each Participating Transmission Owner (PTO) in the CAISO service area, must identify any needed transmission solutions through its annual TPP. The CAISO and PTOs in its service area must also consider lower cost solutions for these identified transmission issues “such as acceleration or expansion of existing transmission solutions, Demand-side management, Remedial Action Schemes, appropriate Generation, interruptible Loads, storage facilities or reactive support.”<sup>1</sup> Furthermore, the state of California has established clear directives mandating the procurement of renewable energy coupled with large- and small-scale energy storage and DERs where feasible and cost effective. California has recognized that the procurement of these types of resources is important to combatting the long-term effects of climate change.<sup>2</sup>

The CPUC requests that the CAISO fully consider energy storage, other DERs or a combination of DERs for the identified reliability issues in all of its TPP planning areas. To facilitate DER consideration, the expected length that contingencies are reasonably expected to last must be identified as well as the respective storage duration need (see comments below under sections 2 and 3). The CAISO preliminary assessment for the reliability issues in this cycle in the Greater Bay, North Valley, Central Valley, Fresno and Central Coast and Los Padres areas did identify possible reliability issues including overloads in the mentioned service areas. However, the CAISO presentations on possible mitigations that might be considered for further study in this year’s TPP cycle for these six study areas did not mention considering energy storage or demand responses or other low-cost DERs in this year’s cycle.

If DERs and other NWAs were already considered as possible solutions, then the CAISO should make more transparent the analysis, assumptions, and method of consideration of the NWAs. At a high level the transparency of the alternative analyses considered needs to be significantly increased. The CPUC notes that the CAISO has identified reliability issues and proposed mitigations in this year’s TPP cycle for the following study areas; however, these study areas did not mention energy storage, demand response or other DERs as possible mitigation options.

- Mission, De Anza and San Jose Divisions in the Greater Bay Area
- The North Valley
- The Central Valley Area, specifically Sacramento, Sierra and Stockton/Stanslaus Divisions
- In the Fresno Area, specifically in Wilson 115 kV sub-area
- In the Central Coast Area, specifically Los Padres sub-area

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<sup>1</sup> *California Independent System Operator Corporation Fifth Replacement FERC Electric Tariff*, Section 24 Comprehensive Transmission Planning Process, 24.4.6.2 Reliability Driven Solutions, CAISO, August 12, 2019, p. 13.

<sup>2</sup> California Senate Bills 1078, 1, 350, 32, 700, 237, 1131, 100 and 1139 and California Assembly Bills 32, 118, 2514.

In the project recommendation section of these comments, CPUC staff identify projects that could have reduced costs and greater benefits if energy storage, demand response or a combination DERs were considered to address identified reliability issues.

## **2. Revise Methods for Determining Energy Storage Costs**

For valuation of potential reliability solutions going forward, CPUC staff recommends that the CAISO and the PTOs within its service area use a cost analysis method for energy storage that reflects its capacity (megawatts/MW), duration/energy (megawatt hour/MWh), as well as the widely expected declining cost trends used in other analyses.

CPUC staff understands that under current practice, when the CAISO and the PTOs in its service area consider energy storage as an alternative reliability solution, they compare its capital costs with the capital costs of wire solutions. Refer to the energy storage cost discussions and presentations on the Pacific Gas and Electric Company (PG&E) Reconductoring project at Wilson-Oro Loma 115kv and the San Diego Gas and Electric (SDG&E) TL 647 Reconductor and TL 693 Loop-In project.<sup>3,4</sup>

CPUC staff recommend considering modification to the current practice on a going forward basis. If energy storage costs per MWh were considered, energy storage costs may be lower or comparable to wire solutions. For example, PG&E has energy storage capacity contracts that are for a specific price per MWh of energy storage capacity rather than for the specific price for the total capital cost of an energy storage system. This difference in price is achievable because energy storage developers and utilities can deploy energy storage to provide more than one service to the CAISO-controlled and the local distribution grids. For this reason, energy storage can have additional benefits and revenue streams and as a result lower costs than the estimated capital costs of an energy storage unit.

Secondly, CPUC staff understands that under current practice, the CAISO and PTOs are not modeling the expected storage cost declines. The TPP stakeholder discussion on September 26, 2019 revealed that the CAISO and the PTOs within its service area have not consider the declining costs of energy storage in their cost analysis for potential mitigations. Given the continued declining costs of energy storage due to on-going investment in advancements, and California's energy storage programs and incentives, the energy storage costs used for valuations should be adjusted to reflect the likely energy storage costs at the anticipated contract date. These adjustments should be based on expected declines in energy storage by type. For example, Wood and Mackenzie estimates that the prices of long-duration front of the meter (FTM) energy storage system will decline by 25 percent between 2019-2021<sup>5</sup> and the price of short-duration FTM energy storage system will decline by more than 15% by 2021.<sup>6</sup> If adjustments are made, the CPUC staff recommend CAISO consider using the storage costs (available as capacity, energy and O&M) as used in the 2019 IRP Proposed

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<sup>3</sup> *Wilson-Oro Loma 115 kV Line Reconductoring*, PG&E's 2019 Request Window Proposals, CAISO 2019-2020 Transmission Planning Process, September 26, 2019, slide 11.

<sup>4</sup> *2019 SDG&E Grid Assessment Results CAISO Stakeholder Meeting September 25-26, 2019, 69-138 kV Project Proposal*, SDG&E TL 647 Reconductor and TL-693 Loop-In, Slides 4-5.

<sup>5</sup> U.S. Energy Storage Monitor Q2 2019 Full Report, Wood Mackenzie Power and Renewables/Energy Storage Association, June 2019, slide 24.

<sup>6</sup> U.S. Energy Storage Monitor Q2 2019 Full Report, Wood Mackenzie Power and Renewables/Energy Storage Association, June 2019, slide 25.

Inputs and Assumptions.<sup>7</sup> (CPUC staff did not check whether this storage declining costs assumption was part of the CAISO TPP Study Plan for the 19-20 TPP.)

### **3. Identify Energy Storage Durations Needed for Reliability Solutions**

CPUC staff suggest that the actual timeframe required to resolve contingencies be considered when reliability needs are identified and validated in the TPP. The amount and timeframe of off-peak recharging capacity during the contingency should also be identified. These considerations are necessary to facilitate the evaluation of DER alternatives to traditional, wired solutions. We are concerned that the specific length of time (or a range) that contingencies may last are not sufficiently addressed in the NERC, WECC, or CAISO planning standards to allow for a consistent and adequate evaluation of energy storage solutions to reliability needs. In certain circumstances, storage could not be used indefinitely if a contingency occurs – however, in other instances, a small amount of storage could be useful even if it required off-peak recharging.

We note that a CAISO stakeholder process may be needed to address this foundational energy-storage issue with respect to reliability planning. However, until a separate stakeholder process is opened or considered, the TPP would benefit from identifying and documenting the expected duration of each contingency identified and recharging capabilities in the area.

In addition, we note that the CAISO Storage as a Transmission Asset (SATA) stakeholder process is now inactive, but even if reactivated, did not appear to be scoped to address the contingency/storage duration issue. The SATA Issue Paper states:

The TPP evaluation methodologies. The ISO is not reexamining the processes that identify the needs and selects the optimal solution(s) to meet identified needs. These issues are appropriately considered in the ISO’s annual TPP. If additional clarification of the evaluation process is needed in the future, it will be addressed on a case-by-case basis within the annual TPP or related processes.<sup>8</sup>

Similarly, the CAISO Energy Storage and Distributed Energy Resources (ESDER) stakeholder process scope does not appear to address the contingency and storage duration issues identified in this comment.

#### Storage Assumptions Based on Four-Hour Durations

CPUC staff suggest that a four-hour energy storage duration may not be the correct de facto assumption for energy storage alternatives to transmission reliability needs in the future. Energy Storage cost and feasibility analyses could vary substantially should lesser durations be appropriate to consider for a given reliability need. It can also be feasible to mitigate contingencies that require more than 4 hours of storage. The 4-hour duration requirement for Resource Adequacy, which is also applied to Local Capacity Requirements (LCR) and corresponding procurement specifications

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<sup>7</sup> CPUC R.16-02-007, 2019 Integrated Resource Planning “Proposed Inputs & Assumptions: 2019-2020 Integrated Resource Planning”, October 4, 2019, p. 59-62.

[https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectP/owerProcurementGeneration/irp/2018/Prelim\\_Results\\_Proposed\\_Inputs\\_and\\_Assumptions\\_2019-2020\\_10-4-19.pdf](https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectP/owerProcurementGeneration/irp/2018/Prelim_Results_Proposed_Inputs_and_Assumptions_2019-2020_10-4-19.pdf), See also Unified RA and IRP Modeling Datasets 2019: <https://www.cpuc.ca.gov/General.aspx?id=6442461894>

<sup>8</sup> *CAISO Storage as a Transmission Asset Issue Paper*, March 30, 2018, p. 9. <http://www.caiso.com/Documents/IssuePaper-StorageasaTransmissionAsset.pdf>

by Load Serving Entities, should not be broadly applied as the basis for eliminating energy storage as a reliability mitigation.

#### **4. Consider Energy Storage as part of a Reliability Solution**

For the CAISO TPP, CPUC recommends the CAISO consider energy storage as part of package of solutions that combine DERs, storage and other lower cost traditional transmission solutions. An example of this kind of solution is the Oakland Clean Energy Initiative (OCEI). CPUC staff believes that there are more opportunities to consider solutions in the TPP that involve combinations of DERs, which could have lower costs and greater benefits. The PG&E's North Oakland Area Reinforcement projects, for example, constitutes large system changes for the East Bay region. It appears to CPUC staff that each of the proposed changes were considered individually, and a holistic evaluation of the potential role of energy storage and other DERs to decrease expenditures on various parts of the reinforcement project does not seem to be part of the planning approach. Please refer to additional comments on the North Oakland Area Reinforcement and Oakland Clean Energy Initiative projects for more details.

#### **5. Include the Energy Storage Replacement Cost Considerations for CAISO Production Cost Modeling in the ESDER Phase 4 Initiative**

CPUC Staff recommends that the CAISO coordinate discussion of this topic in CAISO Energy Storage and Distributed Energy Resources (ESDER) Phase 4 stakeholder initiative. The ESDER Phase 4 stakeholder initiative is currently discussing methods to determine energy storage costs to develop an energy storage default energy bid. The ESDER Phase 4 stakeholders include the PTOs in the CAISO service area, energy storage representatives and energy storage industry experts. For these reasons, CPUC suggests that it would be more efficient and appropriate to coordinate the discussion on this topic in the ESDER Phase 4 Initiative versus in two separate initiatives the TPP and the ESDER.

### **III. The CPUC proposes project specific clarifications or recommendations for Energy Storage as part of reliability solutions.**

#### **A. Recommendations for Energy Storage to be considered for proposed Reliability Projects, or state reasons why DERs are not feasible**

For the Day 1 CAISO presentation on the Valley Electric Association Preliminary Reliability Assessment Results, the mitigation solutions presented for consideration in this year's TPP were: Option 1: New Gamebird Transformer Project, Option 2: New Charleston-Vista 138kV Line, and Option 3: Amargosa transformer upgrade with reactive support. CPUC staff suggest that one or more additional options be considered that include energy storage and other DERs. The estimated duration of each contingency identified should be documented to allow for the consideration of DERs. If the CAISO finds that DER solutions are clearly not possible, please explain why.

For the SCE North of Lugo (NOL) area, voltage overloads were observed at the Inyokern substation. The CAISO presenter did not mention considering alternatives such as energy storage or another DERs as a possible solution for this reliability issue. The CAISO presenter recommended

installing capacitor bank for the mentioned issues without provided background on the range of options considered.<sup>9</sup>

## **B. Recommendations for Energy Storage to be considered as Part of Proposed Reliability Solutions**

### PG&E Northern Oakland Area Reinforcement Project Components:

PG&E's proposal in the 19-20 TPP includes a portfolio of East Bay projects (the Northern Oakland Area Reinforcement) that present a large and complicated system of new expenditures on a variety of transmission and reliability solutions. Many of these 19-20 TPP proposals seem to be interdependent and CPUC staff is concerned that the overall package has not been optimized. Particularly, there does not seem to be any consideration of using energy storage as part of a solution to this multipart construction expenditure. Staff are concerned that each part may have been viewed individually and sequentially and that the potential changes to the overall project that would accrue from, for example, substituting storage for some of the changes were not viewed holistically.

Rebuilding the Moraga-Oakland X lines seems to solve one problem but creates an additional issue that then needs to be solved with other transmission construction. PG&E seems to have eliminated energy storage as too expensive as a stand-alone solution to each individual issue but has not studied the possibility that some energy storage in combination with decreased transmission expenditures may help to alleviate some part of the Moraga Claremont issues that result in the second project. For example, PG&E stated in the meeting that there was not sufficient land to site utility-scale storage in the project area but admitted that they had not considered BTM storage as an option. A more holistic evaluation may be able to consider storage in various locations, including behind-the-meter, as part of the solution to these multi-part reliability issues. As this time, it is not clear whether or not a holistic evaluation of alternatives has been completed.

PG&E also stated that they planned to move some parts of the Moraga-Oakland X lines underground, and PG&E is also planning to rebuild the line as a three conductor instead of four. CPUC staff are not clear why reducing the number of conductors in high fire threat zones is a worthwhile expenditure, or if this has non-fire related reliability benefits. Additionally, it did not seem that PG&E evaluated other fire prevention procedures, such as conductor hardening, tower replacement, or other system hardening efforts PG&E identified in its CPUC approved Wildfire Mitigation Plan (WMP). Staff understands that the reliability issues associated with this project are further in the future and recommends that PG&E conduct a thorough cost comparison of the various potential reliability benefits and fire prevention strategies, and their cost for application to this specific area of transmission lines.

We request that CAISO or PG&E provide answers to the following questions so that the exact problem trying to be solved in the 19-20 TPP is identified.

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<sup>9</sup> *SCE North of Lugo Area Preliminary Reliability Assessment Results, 2019-2020 Transmission Planning Process Stakeholder Meeting September 25-26, 2019, CAISO, September 25, 2019, slide 153.*

1. Identify the specific NERC/WECC/CAISO planning standard category and year that triggers the need for each of the four main components of the Northern Oakland Area Reinforcement Project. A “triggering” need is a forecast contingency under which a planning violation would occur if not mitigated, and this usually would include a fine.
2. If the Moraga 230-kV Bus Upgrade can be completed independently by the 2021/2024 forecast P2 contingency need date, clarify whether the remaining, underlying project purpose would be: (1) public safety due to fire risk; or (2) meeting one or more specific, forecast reliability needs within a 10-year planning period that do not allow for load shedding pursuant to NERC/WECC/CAISO planning standards. If the latter, what is the first year of a forecast reliability need(s) assuming the Moraga 230-kV Bus Upgrade is already completed and define the need category.
3. Explain why undergrounding is being proposed instead of, or whether it is in addition to other types of system or fire hardening within existing transmission line rights-of-way.
4. Identify the precise length of the proposed transmission line work and amount that would be underground. During the Day 2 CAISO stakeholder meeting, PG&E indicated that about eight miles of transmission line work would be required and about four miles of the lines would be installed underground. Also identify the length of new rights-of-way; PG&E indicated about 2.5 miles.

SDG&E Avocado Area P1/P2.1 Contingency Thermal Overload

CPUC staff would like more detail on the proposed Remedial Action Scheme (RAS) that would be used to offset potential reliability issues identified in this TPP cycle on TL698A as discussed in the CAISO presentation on issues in the SDG&E area.<sup>10</sup>

Our specific questions include: Would the RAS stop all charging activities at the Avocado battery? Or would it be configured to limit charging to a certain level? Would there be any differences between the RAS for the loss of 691 and the RAS for the loss of 698A?

**C. Recommendations for Reliability Solution Evaluations to Involve Cost Benefit Analysis of Additional Energy Storage**

i. For the PG&E Fresno Area, Subarea Reedley

CPUC staff requests the CAISO perform a cost benefit analysis of increasing the size of Dinuba Battery Energy Storage System (BESS). The Dinuba BESS is a transmission asset project that mitigates near term issues in the Reedley area and could address longer term issues if its size were increased. CAISO’s presentation on Fresno area issues identified a need in the 2029 study for additional capacity in the Dinuba area. In the presentation CAISO stated that rerated net qualifying capacity (NQC) of a solar facility was a driving factor in causing potential P1-P7 contingencies.<sup>11</sup> While the CAISO had not proposed any additional construction at this time, CPUC staff are interested in seeing an evaluation of the possibility

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<sup>10</sup> *San Diego Gas & Electric Area Sub Transmission Preliminary Reliability Assessment Results, 2019-2020 Transmission Planning Process Stakeholder Meeting September 25-26, 2019, CAISO, September 25, 2019, slide 211.*

<sup>11</sup> *Greater Fresno Preliminary Reliability Assessment, Fresno Area-Results-Reedley Area, 2019-2020 Transmission Planning Process Stakeholder Meeting September 25-26, 2019, CAISO, September 25, 2019, slide 76.*

of expanding Reedley BESS project as a potential solution should this continue to be seen as an issue in future TPP cycles.

- ii. For the SDG&E Main Transmission System Reliability Concern No. 3, 4 and 5<sup>12</sup> CPUC staff requests the CAISO analyze whether energy storage is the low-cost option through a cost analysis.
- iii. For the Oakland Clean Energy Initiative (OCEI), CPUC staff strongly support an evaluation of the potential for increased DER procurement to meet the evolving needs in the OCEI project area. Additional DER procurement should also be carefully evaluated as an alternative to the Northern Oakland Area Reinforcement Project or components of this project.
- iv. For the Local Capacity Assessments, CPUC staff requests the CAISO consider low-cost DER solutions such as energy storage and demand response to reduce or eliminate the need for gas-fired generation<sup>13</sup>.

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<sup>12</sup> SDG&E Main System Preliminary Reliability Assessment Results, *2019-2020 Transmission Planning Process Stakeholder Meeting September 25-26, 2019*, CAISO, September 25, 2019, slides 203-205.

<sup>13</sup> *CAISO Economic Assessment of Local Capacity Areas Extension of 2018-2019 Transmission Plan, 2019-2020 TPP Stakeholder Meeting, September 25, 2019*, CAISO, slide 267