COMMENTS OF THE STAFF OF THE CALIFORNIA PUBLIC UTILITIES COMMISSION REGARDING THE CAISO UNIFIED ASSUMPTIONS & STUDY PLAN FOR THE 2019-2020 TPP FOLLOWING THE FEBRUARY 28, 2019 STAKEHOLDER MEETING

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March 14, 2019

The Staff of the California Public Utilities Commission ("CPUC Staff") appreciates this opportunity to provide comments on the 2019-2020 TPP Draft Unified Planning Assumptions & Study Plan discussed at the California Independent System Operator Corporation's (CAISO) February 28th, 2019 stakeholder meeting. Our comments address the following topics:

1. CPUC staff requests that the CAISO coordinate with the CPUC to revisit the manner in which CPUC resource portfolios are framed and used in the CAISO TPP process.
2. CPUC Staff requests that the CAISO clearly document in the TPP process how the CPUC transmitted "Unified Inputs and Assumptions" are used.
3. CPUC Staff appreciates the addition of the table summarizing the study scenarios, which improves the accessibility of the information for all stakeholders.
4. CPUC staff believes that increased process alignment is necessary to improve the timeliness of information transmittal. This includes both the transmittal of TPP results to the CPUC in a timely manner thus allowing for effective incorporation of the information into the IRP process, as well as the CPUC's transmittal of portfolios to the CAISO each February for the TPP process.
5. CPUC Staff would like to acknowledge the need for coordination with the CAISO on the definition of study areas to allow for a more effective use of inputs and outputs across the planning processes.
6. CPUC Staff requests that the CAISO include in the Study Plan a description of the plan for conducting deliverability assessments in the 19-20 TPP cycle.
7. CPUC Staff asks that the CAISO clarify whether the remaining LCR areas and sub-areas will be studied as part of the economic assessment and whether this is considered to be part of the long-term local capacity requirement assessment.
8. CPUC Staff requests that the CAISO model new pumped hydro storage and new battery storage incremental to the 1325 MW target. CPUC Staff also looks forward to coordination with the CAISO on the question of allocation of energy storage resources, but hope that the CAISO can include, at a minimum, language in the Final Study Plan regarding the modeling of new energy storage.
9. CPUC Staff encourages the CAISO to facilitate the inclusion of duration estimates for each traditional and non-wires reliability projects identified throughout the TPP processes.

10. CPUC Staff maintains its position from the 18-19 TPP cycle that the CAISO's approach of only counting capacity from demand response programs with a response time of 30 minutes or less, as described in the Draft 19-20 Study Plan, does not correspond with current CPUC resource adequacy policy.
11. CPUC Staff requests that the CAISO identify an energy storage duration (or range, low and high) estimated to be sufficient for addressing the N-1 (P1) contingency and (separately) the N-1-1 (P6) contingency associated with the transmission needs identified for the Estrella Project.
12. CPUC Staff acknowledges that the data source used for preferred resource assumptions are outdated. CPUC Staff will coordinate with the CAISO to update these sources for future TPP cycles.
13. CPUC Staff wants to highlight that the IRP resource portfolios and Unified I&A document that will be transmitted to the CAISO for the 2019-20 TPP cycle contain assumptions regarding generation retirement. CPUC Staff suggests that the CAISO do a crosswalk between the specific CPUC and CAISO retirement assumptions.

Detailed Comments

1. ***CPUC staff requests that the CAISO coordinate with the CPUC to revisit the manner in which CPUC resource portfolios are framed and used in the CAISO TPP process.***

The 2019-2020 TPP Draft Study Plan includes the CPUC IRP resource portfolios under section 3.7.2 "Renewable Generation" (p. 24/95), which coincides with the legacy LTPP structure under which the CPUC only transmitted renewable resource information. Since the Integrated Resource Planning process is more comprehensive in nature and may include information regarding other resource types, CPUC Staff requests that the CAISO and the CPUC revisit this assumption moving forward.

Additionally, CPUC Staff requests clarification on the manner in which renewable generation information received from the CPUC will be used in the 2-5 year planning cases (Section 3.7.1 of the Study Plan). The CAISO states "Contracted renewable generation with all permitting and necessary transmission approved and expected to be in-service within 5 years may (emphasis added) also be modeled in the relevant cases." Is it uncertain whether the above renewable generation will be modeled? If so, why?

2. ***CPUC Staff requests that the CAISO clearly document in the TPP process how the CPUC transmitted "Unified Inputs and Assumptions" are used.***

CPUC Staff transmits annually to the CAISO a "Unified Inputs and Assumptions" document to accompany the resource portfolios resulting from the IRP process. CPUC Staff understands that the

CAISO uses numerous sources as input to the TPP and the CAISO has the discretion to choose which inputs and assumptions are ultimately used for modeling. To improve the transparency of the TPP process CPUC Staff requests that the CAISO clearly document how the CPUC transmitted Unified Inputs and Assumptions are used. Which components are used directly, which components are used but modified, what information is not used, and the rationale for the modification or exclusion of specific components. Due to the fast-moving timeline of the TPP process and the relatively short timeframe that stakeholders receive to review long TPP materials, CPUC staff requests that this information be communicated in one central location such as a table or an attachment. CPUC Staff acknowledges that this year the CPUC Unified Inputs and Assumptions is being delivered to the CAISO after the resource portfolios resulting from the IRP process were posted and after the CAISO's posting of the Draft TPP Study Plan. If it is impossible to include this information in the Final Study Plan than at a minimum this summary of what Unified Inputs and Assumptions were and were not used should be included in the TPP draft study results.

3. ***CPUC Staff appreciates the addition of the table summarizing the study scenarios, which improves the accessibility of the information for all stakeholders.***

CPUC Staff appreciates the addition of the table summarizing the "Study Scenarios" found on slide (32/52) of the 2/28/2019 CAISO Stakeholder Meeting slide deck. The table will help stakeholders better understand how the starting cases are created and how they compare to one another.

4. ***CPUC staff believes that increased process alignment is necessary to improve the timeliness of information transmittal. This includes both the transmittal of TPP results to the CPUC in a timely manner thus allowing for effective incorporation of the information into the IRP process, as well as the CPUC's transmittal of portfolios to the CAISO each February for the TPP process.***

CPUC Staff greatly appreciates the coordination with the CAISO that has allowed TPP outputs to inform the IRP process in the past. CPUC Staff look forward to further refining this coordination so that the TPP process and IRP process align in such a way that allows for the most efficient and effective utilization of newly available information developed in both processes.

The need for the increased process alignment became apparent in late 2018/early 2019 as the overlap in the completion of the first IRP cycle and the start of the 19-20 TPP cycle surfaced challenges. According to comments provided by the CAISO on the January 11, 2019 Ruling Seeking Comment on Proposed Preferred System Portfolio and Transmission Planning Process Recommendations, the CAISO stated that "the CAISO needs to receive portfolios by end of February in order to be considered in the

upcoming TPP cycle. After February, it will not be possible to make changes as model set up and development will be underway."

Meeting the February deadline under the current framework may not be sustainable without improvements in processes. In accordance with the TPP process timeline, CPUC Staff did not receive updated transmission capability information from the CAISO until early 2019. After receipt of this information it was necessary for CPUC staff to update IRP portfolios to reflect the new information and pass the updated portfolios to the CEC for substation-level mapping. The best available IRP portfolios were posted on the IRP website by staff on 2/28/2019, barely meeting the CAISO's deadline for inclusion of the information into the upcoming 19-20 TPP cycle.

To improve coordination at the end of the 19-20 TPP cycle, CPUC Staff requests that the CAISO and CPUC coordinate to formalize the provision of "Transmission Capability Estimates and Upgrade Costs" so that CPUC's IRP receives updated data at the same time each year in a manner that works well for the timeline for both processes. This includes, if possible, public posting of data in a manner that allows for full utilization of the data produced in both planning processes with the ability to cite a publicly available data source.

5. ***CPUC Staff would like to acknowledge the need for coordination with the CAISO on the definition of study areas to allow for a more effective use of inputs and outputs across the planning processes.***

CPUC Staff wants to better understand how the 16 areas that will be studied under the reliability assessment compare to the "Transmission Capability Estimates and Costs CAISO Data (2019-2020 TPP)" document[1] and how CPUC Staff can better plan for modeling nested transmission constraints in IRP.

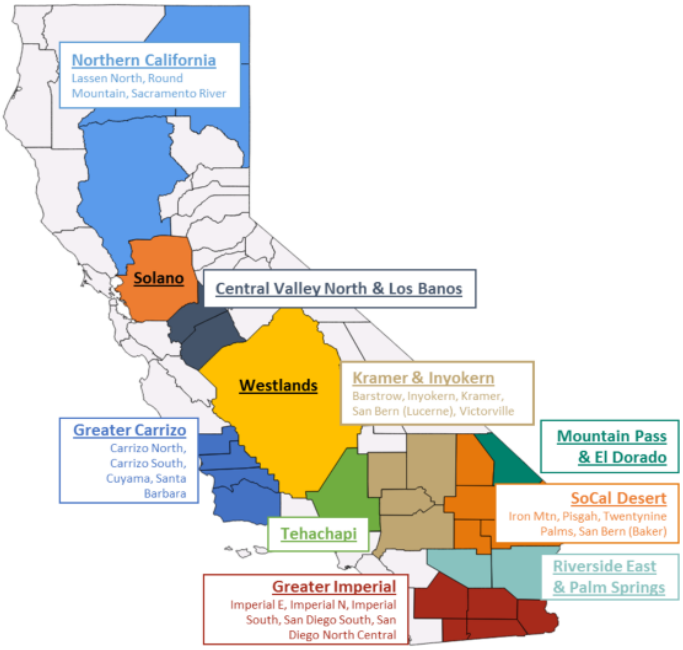
The CAISO does not speak in the Study Plan to the specific study areas used for the deliverability assessment. CPUC Staff requests that the CAISO please provide additional information in the Final Study Plan so that CPUC Staff can plan accordingly and determine whether it's possible to adjust the RESOLVE model in a way that will allow for easier integration of nested transmission constraints. Both plans are included below for reference.

[1] The information received from the CAISO can be found in the CPUC workbook posted here: http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/irp/2018/IRP_TPP_ReliabilityAndPolicyBaseCase_ToBePosted.xlsx

TPP Study Areas

RESOLVE Transmission Zones

Figure 7. In-state transmission zones in RESOLVE.



6. CPUC Staff requests that the CAISO include in the Study Plan a description of the plan for conducting deliverability assessments in the 19-20 TPP cycle.

A key objective of the 2018-19 TPP policy-driven assessments was to test deliverability of FCDS resources in the portfolio. To accomplish this the CAISO initiated the transition to a new deliverability methodology under which the dispatch assumptions modeled solar PV at lower dispatch levels compared to the dispatch levels under the existing deliverability methodology (Slide 22 – Economic Presentation 2018-2019 TPP). The results indicated that lower dispatch assumptions may translate into FCDS for more resources but the new assumptions could also result in higher renewable curtailment.

Although the same objective was maintained in the February 28, 2019 stakeholder meeting presentation (pdf slide 42/52), the CAISO did not speak to this objective in the actual Study Plan. Furthermore, the 2019-20 Study Plan did not include any mention or description of the deliverability methodologies that would be considered or used this TPP cycle. Under Chapter 3, Reliability Assessments: Sensitivity Scenario Definitions and Renewable Generation Dispatch, Table 3.11-4 states that a 20% exceedance level will be used for the scenarios with summer peak with renewable output and minimum gas generation commitment. However, beyond this one mention, the Study Plan does not speak directly to the plan for the deliverability assessment work that will be conducted later this year.

CPUC Staff request that the CAISO share more information regarding the deliverability assessment methodology since the outputs produced directly inform the IRP process.

7. ***CPUC Staff asks that the CAISO clarify whether the remaining LCR areas and sub-areas will be studied as part of the economic assessment and whether this is considered to be part of the long-term local capacity requirement assessment.***

The Study Plan states "The long-time LCR study was performed in the 2018-2019 Transmission Plan and therefore the 2019-2020 transmission planning process will not include a 10 year out study. The ISO undertook in the 2018-2019 transmission planning process a comprehensive review of alternatives to reduce or eliminate local capacity area requirements for gas-fired generation in 22 areas and sub-areas. The assessment of the remaining local capacity areas and sub-areas will be completed as a continuation of the 2018-2019 planning cycle" (p. 58/95). CPUC Staff wants to better understand whether the economic assessment LCR work is considered to be part of the Long-Term Local Capacity Requirement Assessment.

8. ***CPUC Staff requests that the CAISO model new pumped hydro storage and new battery storage incremental to the 1,325 MW target. CPUC Staff also looks forward to coordination with the CAISO on the question of allocation of energy storage resources, but hope that the CAISO can include, at a minimum, language in the Final Study Plan regarding the modeling of new energy storage.***

The CAISO indicated in its February 28, 2019 stakeholder meeting presentation that the 2019-20 Study Plan will not include storage resources in its starting cases unless the resources have been procured by LSEs as part of the CPUC's long-term procurement plan (LTPP) process. In that case, the CAISO will rely on locational information provided by the CPUC. Effective busses will be identified using the residual capacity for potential development after reliability concerns have been identified. CPUC Staff agrees with this and appreciates the CAISO's inclusion of Table 3.8-3 in the Study Plan.

However, CPUC Staff believes that the total energy storage resources considered in the TPP study cases should include existing pumped hydro storage, existing battery storage, committed battery storage to ensure achievement of the CPUC 1,325 MW storage target by 2024, and new battery storage by 2030 that is beyond the 1,325 MW target and new pumped hydro storage (i.e., selected by RESOLVE). Currently, the Study Plan does not speak to whether the CAISO plans to model energy storage incremental to the already existing storage.

The remaining battery storage resources needed to achieve the 1,325 MW target and new battery storage resources beyond the target are generic and need to be sited to transmission substations to facilitate network reliability studies. It is unknown whether this generic storage will be used primarily

for renewables integration or to meet local capacity requirements. CPUC Staff will coordinate with the CAISO and its 2019-20 TPP study process to jointly develop a framework for siting generic storage to locations that provide the highest value to resolving renewables integration and/or local capacity reliability issues. This process can reveal more valuable locations and use cases for storage that can inform market participants where projects should be interconnected. The development of a framework for siting the remaining battery storage resources will rely on 19-20 draft TPP results that will not be available until early fall, 2019. CPUC Staff that this work will allow for inclusion of the total energy storage resources in the final study cases that the CAISO runs in the 19-20 TPP process.

9. ***CPUC Staff encourages the CAISO to facilitate the inclusion of duration estimates for each traditional and non-wires reliability projects identified throughout the TPP processes.***

One of the barriers to considering energy storage as a transmission asset has been the difficulty of pinning down an acceptable duration (megawatt hours). Duration is a key cost consideration and can also be a significant siting consideration. The starting duration assumption is often 4 hours, which reflects the approach adopted for Resource Adequacy planning. CPUC Staff notes, however, that while the CAISO has made great progress with the integration of energy storage into its TPPs, duration has frequently been absent from the storage projects listed in the 2017-2018 and 2018-2019 TPPs. Going forward, CPUC Staff encourages the CAISO to facilitate the inclusion of duration estimates for each traditional and non-wires reliability projects identified throughout the TPP processes. Duration estimates should be communicated to stakeholders in the earliest possible TPP phases. In this way, storage durations to meet reliability needs can be commented on by all stakeholders, which would improve the accuracy of duration estimates and overall quality of energy storage proposals (e.g., improved cost, siting, and project footprint assumptions).

10. ***CPUC Staff requests that the CAISO identify an energy storage duration (or range, low and high) estimated to be sufficient for addressing the N-1 (P1) contingency and (separately) the N-1-1 (P6) contingency associated with the transmission needs identified for the Estrella Project.***

The Estrella Substation and Paso Robles Area Reinforcement Project (2013-2014 TPP) is currently under CEQA review at the CPUC. CPUC Staff is considering battery storage alternatives. As a case study, we request that the CAISO identify an energy storage duration (or range, low and high) estimated to be sufficient for addressing the N-1 (P1) contingency and (separately) the N-1-1 (P6) contingency associated with the transmission needs identified for the Estrella Project. CPUC Staff assumes that a battery of sufficient duration to address the P6 event could also address the P1 event (assuming the P1 and P6

events do not overlap). CPUC Staff would also like to understand what the CAISO estimates to be a sufficient lesser duration for addressing the P1 event alone.

11. ***CPUC Staff maintains its position from the 18-19 TPP cycle that the CAISO's approach of only counting capacity from demand response programs with a response time of 30 minutes or less, as described in the Draft 19-20 Study Plan, does not correspond with current CPUC resource adequacy policy.***

CPUC Staff maintains its position from the 18-19 TPP cycle that the CAISO's approach of only counting capacity from demand response programs with a response time of 30 minutes or less, as described in the Draft 19-20 Study Plan, does not correspond with current CPUC resource adequacy policy, which does not place a response time requirement on local RA resource. The CPUC Resource Adequacy proceeding will ultimately determine what types of DR programs can count for local RA and meet local capacity needs.

Furthermore, CPUC Staff would like for the CAISO to clarify exactly what data source was used for Table 3.8-1. The source may need to be updated as CPUC Staff has found at least two values that need to be corrected. The DRAM total across all IOUs in 2019 should be 403.8 MW rather than 205 MW. This includes the planning reserve margin adder (351.19 MW * 115%). Additionally, the assumed market of the SCE LCR RFO is PDR and the correct amount is 76 MW for 2019.

Table 3.8-1: Existing DR Capacity Range for Each IOU Load Serving Entities within ISO BA

Supply-side DR (MW):		PG&E	SCE	SDG&E	All IOUs	Assumed Market	Assumed 30 minute responsive
Load Impact Report, 1-in-2 weather year condition portfolio-adjusted August 2027 ex-ante DR impacts at CAISO peak							
BIP		300	610[35]	6.74	917	RDRR	Yes
AP-I			50[36]	0.0	50	RDRR	Yes
AC Cycling Res[37]		61	56	7.18	124	PDR	Yes
AC Cycling Non-Res		0	20[38]	1.79	22	PDR	Yes
CBP		103[39]	143[40]	8.44	254	PDR	No
Other procurement program DR							
SCE LCR RFO,[41] post 2018			5.0		5	RDRR	Yes
DRAM[42]	2017	56.4	56.2	12	125	PDR[43]	No
	2018	79.5	88.5	13.9	182		
	2019	90.1	99.2	15.7	205		

12. ***CPUC Staff acknowledges that the data source used for preferred resource assumptions are outdated. CPUC Staff will coordinate with the CAISO to update these sources for future TPP cycles.***

The Draft 19-20 Study Plan states "As in the 2018-2019 planning cycle, reliability assessments in the current planning cycle will consider a range of existing demand response amounts as potential mitigations to transmission constraints. The reliability studies will also incorporate the incremental uncommitted energy efficiency amounts as projected by the CEC, distributed generation based on the CPUC Default RPS Portfolio and a mix of preferred resources including energy storage based on the CPUC LTPP 2012 local capacity authorization. These incremental preferred resource amounts are in addition to the base amounts of energy efficiency, demand response and "behind the meter" distributed or self-generation.

CPUC Staff suggests a few revisions to the Study Plan text included above. First, the CAISO should include storage alternatives as a potential mitigation to transmission constraints. Furthermore, rather than using outdated CPUC LTPP 2012 data, CPUC Staff recommend approved procurement authorizations as a data source. Additionally, the term "incremental uncommitted energy efficiency" may need to be updated to "Additional Achievable EE." Finally, CPUC Staff suggest the last sentence read as follows, "These incremental preferred resource amounts are in addition to the base amounts of energy efficiency, demand response and "behind the meter" distributed or self-generation forecasted in the baseline forecast by the CEC in the IEPR."

13. ***CPUC Staff want to highlight that the IRP resource portfolios and Unified I&A document that will be transmitted to the CAISO for the 2019-20 TPP cycle contain assumptions regarding generation retirement. CPUC Staff suggest that the CAISO do a crosswalk between the specific CPUC and CAISO retirement assumptions.***

All portfolios that the CPUC recommends for study in the 2019-20 TPP include planned or announced retirements from existing units (such as Diablo Canyon Power Plant and other once-through-cooled units), plus an incremental 40-year age retirement assumption to approximate additional potential for existing fossil units to retire within the IRP planning horizon. Specifically, existing fossil units older than 40-years age and without an existing contract in the year being studied are assumed retired. The CAISO's TPP should study the transmission implications of up to this level of retirement to inform the question of how much existing generation may need to be retained to cost-effectively maintain not just system but also local reliability standards.

Thank you for the opportunity to provide comments.

Contact: Karolina Maslanka, karolina.maslanka@cpuc.ca.gov