



February 21, 2020

Submitted to the CAISO at [regionaltransmission@caiso.com](mailto:regionaltransmission@caiso.com) by Shannon Eddy, Executive Director, Large-scale Solar Association

**RE: LSA and SEIA comments on CAISO Draft 2019-2020 Transmission Plan**

The Large-scale Solar Association (LSA) and Solar Energy Industries Association (SEIA) (together, the “Solar Companies”) appreciate the opportunity to comment on the CAISO’s draft 2019-2020 Transmission Plan (Plan). Their comments focus on two areas:

- **Portfolio assumptions in the Deliverability Assessment**, i.e., that the Transmission Planning Process (TPP) renewables portfolios continue to reflect assumptions about the amount of deliverability that do not reflect actual Load-Service Entity (LSE) procurement activities; and
- **CAISO criteria for recommending Policy-Driven transmission upgrades**, i.e., that even where TPP portfolio analysis results strongly indicate the need for additional transmission upgrades, the Plan uses non-transparent or questionable criteria to refrain from recommending such transmission upgrades.

These issues are explained in more detail below.

**Deliverability assumptions in Deliverability Assessment**

The generation-capacity portfolio numbers regarding Full Capacity Deliverability Status (FCDS) in the TPP studies are shown below.

<i>TPP STUDY</i>	<i>BASE</i>	<i>SENSITIVITY 1</i>	<i>SENSITIVITY 2</i>
Deliverability Assessment (FCDS)	5,200 (54%)	9,290 (50%)	7,714 (46%)
Production-cost modeling (PCM)/snapshot study capacity)	9,861	18,383	16,822

It appears that only about half the new capacity in these portfolios is assumed to be FCDS. This assumption simply does not reflect reality in the procurement market today.

Virtually every LSE competitive solicitation requires FCDS. Several large LSEs claim to have contracted enough renewable supply to meet the 50% Renewables Portfolio Standard (RPS) requirement, and nearly all the competitive solicitations resulting in those contracts required FCDS. Projects contracted as a result of those competitive solicitations that fail to acquire FCDS can face severe financial penalties and/or cancellation of their Power Purchase Agreements (PPAs).

The Solar Companies understand that the portfolios used by the CAISO are largely based on those provided by the CPUC, and that it is unlikely that the CAISO will completely re-do its analyses at this late stage of this cycle. However:

- The CAISO is not legally obligated to use the CPUC portfolios as is and, in fact, has occasionally adjusted those assumptions in the past.
- LSA has pointed out this problem in the past, but the CAISO does not seem to have made any public effort to work with the CPUC to develop more realistic assumptions.

Unrealistically low FCDS assumptions are likely already leading to unrealistic estimates of the transmission needed to accommodate LSE-procured resources (see below), meaning that area constraints requiring mitigation for required deliverability will simply not be mitigated.

This issue will be even more critical going forward, assuming FERC approval of the CAISO’s new deliverability methodology, since that will lower resource-dispatch assumptions further in the Policy-Driven analyses. It is important to address this issue promptly in the next TPP cycle to avoid exacerbating the transmission need under-assessment problem.

### **Criteria for recommending Policy-Driven transmission upgrades**

The Solar Companies are very concerned that the CAISO studies in this TPP cycle identify numerous overloads without even one CAISO recommendation for mitigation other than increased curtailment of renewables. Specifically, the Plan analyses revealed very high levels of forecasted curtailments in most areas, even under the optimistic 2,000 MW Export scenarios, and the Solar Companies believe that these analysis results warrant designation of Category 1 and/or 2 transmission upgrades to address them.

- **The Deliverability Assessment** (FCDS resources only) curtailment summary by zone is shown below. The 2,000 MW net export scenarios show 15-22% curtailment in half of the renewables areas studied, including the top three areas with highest expected renewable-capacity development (shown in yellow highlight). The sensitivity cases for this export assumption show curtailments in the 23-42% range in these key regions.

TRANSMISSION ZONE	BASE		SENS-01		SENS-02	
	2k MW net export limit (13%)	Export limit relaxed (3%)	2k MW net export limit (22%)	Export limit relaxed (7%)	2k MW net export limit (21%)	Export limit relaxed (6%)
Northern California	2%	0%	9%	0%	9%	1%
Solano	1%	0%	3%	0%	3%	0%
Central Valley/Los Banos	9%	11%	20%	29%	16%	26%
Westlands	12%	5%	24%	15%	21%	11%
Greater Carrizo	16%	8%	21%	15%	19%	15%
Tehachapi	13%	4%	21%	9%	20%	11%
Kramer/Inyokern (Greater Kramer)	21%	12%	32%	25%	32%	22%
Riverside East and Palm Springs	15%	0%	30%	1%	30%	1%
Greater Imperial	20%	0%	41%	7%	42%	8%
Southern NV/Eldorado/Mtn. Pass	22%	6%	23%	11%	27%	8%

The analysis details further identify many areas with specific serious base-case overloads that only worsen under sensitivity assumptions, including:

- **Greater Kramer**, where the worst overloads are on the Lugo 500/230 kV transformer bank 1 or 2, with an outage of the other bank – 123% Base-case loading, 179% Sensitivity 2 loading. The Plan says “mitigating Base Portfolio contingency overloads...would require pre-contingency curtailment of renewable resources in this zone” under study conditions.

- **Southern NV/Eldorado/Mountain Pass**, where serious overloads include:
  - Mercury-Northwest 138 kV line, with an outage of the Northwest-Desert View 230 kV line (246% Base-case loading, 268% Sensitivity 1 loading); and
  - Pahrump 230/138 kV transformer bank 1 & 2, with outages of the Pahrump 230/138 kV transformer bank and Pahrump-Innovation 230 kV line (149% Base-case loading, 132% Sensitivity 2 loading)
- **Solano/Northern California**, where the Plan states that Vaca Dixon-Lambie 230 kV line overloads are “likely to result in increased existing renewable curtailment because curtailment of non-renewable generation would not be adequate to mitigate the issues.”

Finally, since this analysis does not assume any dispatch of Energy Only generation – which comprises nearly half the CPUC renewables portfolio – these numbers undoubtedly underestimate the total renewables curtailment under these study assumptions.

- **The PCM analyses**, which consider both FCDS and Energy Only resources, likewise show significant renewables curtailments (15-27%) under 2,000 MW export scenarios, as seen below.

SCENARIO	BASE		SENS-01		SENS-02	
	2k MW net export limit	Export limit relaxed	2k MW net export limit	Export limit relaxed	2k MW net export limit	Export limit relaxed
Total Wind & Solar Generation (TWh)	81.42	91.21	91.21	109.30	93.88	112.00
Total Curtailment (TWh)	12.12 (15%)	2.34 (3%)	25.77 (28%)	7.68 (7%)	25.16 (27%)	7.04 (6%)

Curtailments are considerable in several high-renewables areas. Over 2,500 MW of generation is shown as curtailed under the 2,000 MW net export scenario for each of the SCE Tehachapi and SCE East of Lugo areas (over 4,000 MW each under sensitivity conditions), and curtailments are also significant for the SCE Eastern and PG&E Westlands-Fresno-Kern areas under both base and sensitivity conditions.

Despite these considerable overloads even under base-case conditions, the Plan does not recommend any Condition 1 or even Condition 2 upgrades. Instead, the Plan uniformly recommends only increasing curtailments (including renewables curtailments) to address these situations, e.g., observing that a higher need for “portfolio resources to participate in RASs and/or experience congestion management was evident in several zones.”

There was no attempt in the Plan to determine whether the significant curtailments identified could impair California’s ability to meet its greenhouse-gas (GHG) targets. The CPUC portfolios were developed specifically to attain those goals, and it’s hard to see how that would be possible if a large portion of that capacity is curtailed a large portion of the time.

The CAISO offered several reasons in the stakeholder-meeting discussion for not recommending any upgrades despite the numerous indications that upgrades are needed. Some of those reasons are described below.

- **The relaxed-export limit scenarios show fewer curtailments for most areas.** LSA has long argued that even the 2,000 MW export limit is overly optimistic, and any assumption of no limits other than physical are even more unrealistic.

The CAISO remains highly import-dependent, i.e., there is no sign yet that the very significant market transformations needed to convert CAISO markets into anything close to a typical 2,000 MW net export position have yet begun. Moreover, a very large proportion of the new generation under consideration and/or development outside California is intended to serve the California market; the Solar Companies know of no jurisdictions that include in their resource planning widespread (or any) renewable or other generation imports from California.

The Solar Companies believe that the severe results from the 2,000 MW export scenarios call for Category 1 recommendations or, at a minimum, some Category 2 designations that can be examined more closely in the next cycle.

- **“Things might change.”** Of, course, things might always change, and there are no certainties in these analyses. Most notably, implementation of the CAISO’s new deliverability methodology might improve results of the Deliverability Assessment.

Nevertheless, these analyses are performed so that the results can be used for reasoned decision-making. The CAISO said itself that implementation of the new deliverability methodology might not free up that much deliverability given the high volume of recent energy storage addition requests, and associated deliverability transfers from variable-resource capacity to that added storage. Moreover, the new deliverability methodology would not improve results of the PCM assessment.

The CAISO has not released any figures from these recent submittals but, particularly if the capacity involved is considerable (and, therefore, the revised deliverability methodology might not impact Deliverability Assessment results significantly), then Category 1 and/or 2 upgrade recommendations are warranted here, based on both study types.

- **The CAISO might consider those upgrades in the economic analyses.** However, the CAISO does not perform its economic analyses in this manner – e.g., examine areas with the most severe renewables curtailments to see if mitigation would be cost-effective. Instead, the CAISO generally identifies economic studies by examining transmission paths with the highest overall congestion costs. The CAISO’s economic analyses in the Plan, for example, did not appear to include any of the areas identified above with the most severe expected renewables curtailments.

In conclusion, the TPP is the forum for identifying and addressing area- and region-wide and other upgrades. Large-scale curtailments of renewable resources will jeopardize attainment of California’s ambitious GHG goals, and so mitigating transmission upgrades should be considered for inclusion in the final 2019-2020 Transmission Plan.