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Submitted to the CAISO at regionaltransmission@caiso.com by Tim Mason, Policy Director

RE: Comments of the Large-scale Solar Association on 2018-2019 TPP preliminary reliability study

LSA appreciates this opportunity to comment on the CAISO 2018-2019 Transmission Plan preliminary reliability study. These comments are based on information included in the preliminary study results posted on August 15, 2018, and the presentations at the September 20 and 21 stakeholder meetings.

Introduction

The CAISO Transmission Plan (Plan or TPP) is instrumental to ensuring that California meets its long-term electric requirements reliably and at least-cost, as well as ensuring that the electric generating resources used also support California's policy and environmental objectives. It is imperative the Plan provide a long-term view of what is likely to occur based on the best available information so that generation developers can plan where to locate facilities and transmission owners and developers can identify, plan and construct needed facilities to support these resources and load requirements. After reviewing the preliminary reliability studies and presentations at the September 20 and 21 stakeholder meeting, LSA is concerned the 2018-2019 TPP is a reflection of current grid rather than a strategic planning document that envisions and plans for the needs of the future grid. We appreciate that is it difficult to envision how the grid will change over time, and even more difficult to develop and justify the assumptions necessary to model this future state. That said, planning for the future state of the grid is the point of the of the TPP and this Plan, as modeled, is of limited value for helping generation and transmission developers and owners understand what transmission facilities will be required.

Our concern with this lack of a long-term vision in the Plan is not new – we expressed similar concerns last year. In the 2017-2018 CAISO Transmission Plan, the default case assumed a 33% renewable energy requirement for California in 2030, despite the fact that the then-current RPS requirements (enacted in SB350 in 2015) were 50% in 2030. This resulted in a Plan that was obsolete by the time it was adopted by the Board of Governors, since it did not accurately reflect future requirements or resources. We fear this plan will suffer the same plight unless several substantial revisions are made for the policy and economic study that is scheduled for completion by November 16.

Several key assumptions used in the 2018-2019 TPP analysis are deeply flawed, including the CAISO decision to use the 50% renewable scenario as the "default" case and the

incorporation of inappropriate portfolio assumptions that do not reflect commercial or operational reality or current trends in development. These are discussed in detail below.

CAISO 2018-2019 TPP should use the 42 MMT Case as the Default Modeling Case

The CAISO developed and is modeling two scenarios for the TPP, including a default case that assumes 50% RPS in 2030, and a sensitivity case that assumes an annual carbon emissions limit from electric generators 42 million tonne (MMT) in 2030. The default scenario represents what was until very recently the legal minimum requirements for renewable resources in California, while the 42 MMT scenario represented the emission goals developed by the California Air Resources Board (CARB) for the electric sector, which was adopted by the California Public Utilities Commission (CPUC) for its 2018 Integrated Resource Plan (IRP) Reference System Plan (RSP). The primary difference between these scenarios is the amount of renewable generation and storage that are included in the resource plan, with the default case including 3,487 MW of new renewables while the 42 MMT scenario includes 10,226 MW of new renewables and 2,000 MW of new storage.

On September 10, 2018 Governor Brown signed Senate Bill 100 (SB 100) into law, which requires California LSEs to serve all customer energy needs from carbon-free or renewable resources by 2045. SB 100 also requires that sixty percent of energy served by LSEs is from renewable energy resources by 2030, and establishes new annual RPS procurement targets, whereby each LSE will need to achieve 44% of retail sales by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030.

LSA appreciates the passage of this legislation occurred well after the CAISO began the TPP modeling and it is late in the process to shift course. That said, the new requirements are very similar to the 42 MMT sensitivity, and that scenario should be used for the "default" case going forward. Using the 42 MMT as the default case better reflects the current state policies and will result in the development of a more robust and meaningful plan that reflects current legal requirements.

Portfolio Assumptions

The Plan modeling and analysis includes a myriad of assumptions on loads, resources, and transmission, some which are developed by the CAISO and others that are developed by the CPUC and CEC. Regardless where these assumptions are generated, the CAISO Plan should reflect the most current information and accurately reflect the likely state of the system and resources. LSA is concerned that the Plan includes many inappropriate, dated and incorrect resource and transmission assumptions which should be rectified prior to the CAISO moving forward with the Plan policy and economic analyses.

Existing resources

LSA understands the resource information used in the TPP is from the CPUC IRP, modified by the CEC to provide location-specific information needed by the CAISO for modeling. We are concerned these assumptions significantly overstate the role for existing resources in future years, distorting resource dispatch, transmission flows, and the need for additional resources. Many stakeholders, including LSA, expressed these concerns in the CPUC IRP (which CPUC is a party to), and LSA understands the CPUC is in the process of revising these assumptions for the IRP Preferred System Plan (PSP) currently under development.

Per the TPP documentation resources identified as "retiring resources" are assumed to remain on the grid but off-line, including once-through cooling (OTC) resources, the Diablo Canyon Power Plant (DCPP), and other contract-expired resources. These resources are not removed from the plan until they are physically dismantled and disconnected from the system. This assumption leads to potentially misleading results regarding system capacity requirements and transmission availability. Coastal OTC resource are closing not for economics but because they cannot meet the legal environmental requirements that would allow for continued operation. Further, the DCPP closure has been approved by CPUC and is currently being implemented. Given the lead time required to plan maintenance and refueling, it is almost impossible to imagine a scenario that would allow DCPP to continue operating past 2024. Other thermal and renewable resources with contracts expiring in the forecast period are largely uneconomic and, based on the RPS plans recently filed by load serving entities (LSEs) with the CPUC in August of this year, there appears to be no market interest for these resources. All of these resources should be eliminated from CAISO TPP modeling once they are retied by their owners or their contracts expire. If system energy and capacity needs are identified as a result of their exclusion, this represents an important finding for the TPP process.

LSA is also concerned that the failure to remove these resources distorts available transmission capacity and transmission needs for new generators. The information provided at the Stakeholder meetings is silent on how the removal of these resources will impact transmission capability. Based on lack of transmission availability in the areas where known resources are retiring, such as DCPP, it appears the transmission is still allocated to these resources. The retirement of these resource will free up a substantial amount of transmission, which can then be used by new and preferred resources without having to add additional infrastructure.

Behind the Meter Photovoltaic (BTM PV)

TPP modeling includes BTM PV as a supply side resource rather than a load modifier. LSA appreciates that the size and impact of BTM PV on the grid makes it difficult to model as a load modifier, and it is expedient to include this as a supply resource, but there are several unconsidered consequences of this, include the role of BTM PV in providing for Resource

Adequacy, the impact on the transmission system and a broader question of how all BTM resources should be treated in system modeling.

According to the CAISO's own definition of resources, BTM PV is clearly a load-modifying resource. In its Demand Response and Energy Efficiency Roadmap: Maximizing Preferred Resources guide[1], the CAISO identifies which resources are supply and which are load modifiers, explaining:

> Supply-side resources are those energy supplies available to the ISO to balance net load. These resources can take different forms, ranging from conventional generators to demand response. Supply-side resources are used to directly balance load, manage congestion and satisfy reliability standards. Supply-side resources inject or curtail energy in specific locations, and can be modeled, optimized, and dispatched when and where needed by the ISO.
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> Load-modifiers are those resources or programs not seen or optimized by the ISO market, but they modify the fundamental system load shape, preferably in ways that harmonize with ISO grid operations.

By these definitions, BTM PV is clearly a load modifier, as they are neither seen nor optimized by the CAISO, but they do modify the fundamental load shape. Further, BTM PV resources cannot be supply resource as they cannot be used to directly balance load, manage congestion, be optimize or dispatched.

LSA is also concerned about this assumptions impact on the determination of RA requirements. Including BTM PV resources as a supply resource may qualify them as RA resources, though they do not possess any of the characteristics necessary to be RA resources. The CAISO's glossary defines resource adequacy as:

> The program that ensures that adequate physical generating capacity dedicated to serving all load requirements is available to meet peak demand and planning and operating reserves, at or deliverable to locations and at times as may be necessary to ensure local area reliability and system reliability.[2]

BTM resources are widely distributed, static, and are neither "at or deliverable to locations and at times as may be necessary to ensure local area reliability and system reliability." LSA believes that for RA purposes, BTM PV should be counted as a load for purposes of RA requirements determination, but the BTM PV should not be provided any RA capacity benefit.

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[1] Demand Response and Energy Efficiency Roadmap: Maximizing Preferred Resources, CAISO, December 2013. https://www.caiso.com/documents/dr-eeroadmap.pdf

[2] http://www.caiso.com/Pages/glossary.aspx?SortField=Acronym&View={8034109d-e87a-4203-90dc-41ff59ca116e}&FilterField1=Letter&FilterValue1=R&SortDir=Asc&FilterField2=Acronym&FilterValue2=RA

Modeling Behind the Meter Resources

LSA is also concerned about the modeling of BTM solar and other BTM generation technologies. There are numerous BTM wind facilities, a rapidly expanding number of fuel cells and other BTM generation technologies, and a rapid expansion of BTM storage, which will dramatically change customer load shapes. These resources are not considered supply resources by the CAISO, rather are load modifiers. BTM PV resources are no different from these, other than the fact that there is a higher penetration of them on the system. To the extent the CAISO believes that BTM resources, due to their scale and impacts, should be considered as unique and different from other load modifiers, LSA believes the CAISO should assess this is a separate stakeholder process.

New renewable resources

The TPP incorporates the CPUC IRP assumption of resource need, which forecast an addition of 3,487 MW in the default case and 10,226 MW in the 42 MMT case. While we appreciate the coordination between the two initiatives, the IRP assumptions on new solar resources do not reflect the market reality of where future solar will be located, and perpetuating this mistake in TPP modeling undermines the usefulness of the Transmission Plan. In the IRP, all of the new solar resources are located in Southern California, which does not reflect the current or future development patterns. LSAs analysis of the interconnection queue reveals that in recent years solar interconnection requests have been shifting northward, and going forward solar development will likely be less concentrated in Southern California. To illustrate this, of the CAISO 2018 interconnection requests that identify PV as the Type 1 fuel source, 12 of the 29 were located **north** of Kern County, while the IRP and TPP assume all new solar will be located in or south of Kern County.

A more evenly distributed set of solar resources makes sense for several reasons. First, solar PV costs have fallen precipitously in recent years, making it economic to build in areas with lesser irradiance, such as central and northern California. Additionally, there is very limited transmission capacity available in southern California and developing any major transmission facilities will take over ten years, and interconnection costs for generators locating there are substantial and many times, prohibitive. Finally, in their IRP and RPS Plans, many LSEs express strong interest in procuring resources in or adjacent to their service territories, and developers are responding to this by developing projects that are more distributed throughout the state and region.

FCDS and EODS

LSA is deeply concerned over the TPP assumption that approximately 40% of new resources will have energy-only interconnections. This may be consistent with CPUC IPR RESOLVE modeling, but this in no way reflects the market for RPS-complaint resources. Market buyers

have no appetite for long-term contracts with EO resources, as borne out by recent RFPs from Community Choice Aggregation (CCA) entities.

This is also reflected in the interconnection queue. Only one of the 29 solar resources seeking interconnection in 2018 selected Energy-only as the preferred interconnection. Unless there is a substantial market alteration, is unlikely that we will see the assumed contracting and development of EO resources. Failure to plan sufficient transmission to interconnect resources requiring FCDS will result in California neither achieving its mandated RPS requirements nor its GHG emissions goals.