

BAMX Comments on the CAISO Draft 2016-17 Transmission Plan

The Bay Area Municipal Transmission group (BAMx)¹ appreciates the opportunity to comment on the CAISO Draft 2016-17 Transmission Plan (Draft Plan). The comments and questions below address the multiple *Draft Transmission Plan* studies, findings and recommendations included in the CAISO Draft 2016-17 Transmission Plan dated January 31, 2017 and were subsequently discussed during the February 17th stakeholder meeting.

Introduction

BAMx is highly encouraged by the findings within this transmission planning cycle concerning the reduced need for reliability driven transmission upgrades. Due to changes in forecast of California's load and changes in both state policies and customer behavior, only two new reliability projects have been identified and many previously approved projects are under review. Many of the BAMx comments have been driven by a concern about achieving a balance between customer reliability and cost in the face of past and forthcoming substantial increases in the Transmission Access Charge (TAC). As such, TAC forecasts are an integral part of the transmission plan and BAMx looks forward to reviewing the CAISO's updated TAC model that is expected to be incorporated into the Final Draft Transmission Plan.

BAMx supports the CAISO's initiative to review previously approved projects and recognizes the significant resources required to conduct such a review. As the load forecast in many planning areas has significantly decreased, the previous finding of need for approved projects merits review of both whether the need still exists or if the approved project scope is still appropriate. In this planning cycle, the CAISO has proposed the cancellation of 13 projects and placed another 16 projects on hold. Based upon PG&E's most recent cost estimates provided to the CPUC, these projects represent a cumulative cost of almost \$4.5 billion.²

For those reliability projects that either did not make the list or those on the list that may ultimately proceed in some form, BAMx encourages the CAISO to provide more transparency to the process used in its evaluation and the deciding factors in concluding that the project is still needed.³

Reliability Transmission Projects

BAMx supports the CAISO approval of the Lugo-Victorville 500 kV Upgrade. The Lugo-Victorville 500 kV Upgrade is a low cost upgrade that facilitates access to a wide range of resource options as well as addresses congestion issues. The CAISO's findings suggest that this project also has elements of being both economic and policy driven project. With respect to the Big Creek Rating Increase Project, BAMx is concerned about the lack of stakeholder review of

¹ BAMx consists of City of Palo Alto Utilities and City of Santa Clara, Silicon Valley Power.

² This capital cost estimate is based on the PG&E Quarterly Project Status Report filed with the CPUC on January 2, 2017 in compliance with the CPUC's Order Instituting Investigation implementing AB 970.

³ Also, posting the revised 2026 base cases that were used in the review would facilitate stakeholders' understanding of the need.

the SCE Transmission Line Rating Remediation (TLRR) program that proposes to spend almost \$400 million on improvements on the 230 kV transmission in the Big Creek corridor. Such fragmentation makes it difficult for stakeholders to understand whether the current plan is the most cost effective approach for addressing both the line clearance issues and transmission capacity needs in this area. This highlights the need for future process improvements whereby stakeholders are included in a more comprehensive review of planned capital expenditures.

While the Caltrain Electrification Project is a load interconnection project under the PG&E Transmission Owner's Tariff and therefore not formally part of the CAISO's approved transmission plan, BAMx is concerned about the high cost (\$228 million) for two 115 kV load interconnections. BAMx appreciates the CAISO's review of the proposal, but requests that greater information concerning its finding that alternatives are infeasible. (For example, were alternative substation configurations considered.) Also, greater information concerning the cost allocation for the proposed facilities should be provided by PG&E to clarify who is bearing the cost for the proposed design. If a customer reliability requirements, such as redundant Interconnection Facilities, are driving such an expensive mode of interconnection, they should pay for the associated cost.

With respect to the review of previously approved projects, BAMx supports an earlier CPUC Staff request for a list of all previously approved projects that have not yet begun construction and were reviewed by the CAISO. With the increased reliance on Preferred Resources, where the location may not be determined toward the end of the planning horizon, and with the recent legislative mandate to double the energy efficiency goals, BAMx recommends maintaining a list of approved projects that have not yet begun construction, so that the continuing need and timing can be reviewed as part of future planning cycles. BAMx also supports tracking the ballooning cost projections of all previously approved projects. For example, just looking at the four projects for which the CAISO recommends continued development but not filing for permitting and certificates of public convenience and necessity,⁴ the total cost forecast when each was approved was \$440 million. However based upon PG&E's latest estimates, these projects are forecast to cost a total of \$1.74 billion, an increase of almost 300%.⁵ A review of other projects on the list show a similar trend toward spiraling project costs.

BAMx supports the CAISO's review and findings with respect to the ten Request Window projects for the San Diego area. The CAISO's recommendations for four special protection systems and four operational mitigations to address the reliability concerns reflect an appropriate concern for consumer costs in addressing compliance with the Planning Standards. If proponents wish to continue to recommend more costly capital upgrades, quantitative analysis is needed to demonstrate why such upgrades are in consumers' interest.

⁴ These four projects are Midway-Andrew 230 kV Project, Spring Substation, Wheeler Ridge Junction Substation and Lockeford-Lodi Area 230 kV Development.

⁵ Based on the PG&E Quarterly Project Status Report filed with the CPUC on January 2, 2017 in compliance with the CPUC's Order Instituting Investigation implementing AB 970.

BAMx would also like to comment on some of PG&E's previously approved projects that the CAISO has put on hold during this year's transmission planning cycle.

Midway-Andrew 230kV Project

Midway-Andrew Transmission Project was approved during the 2012-2013 transmission planning process. The original approval cost estimate of the Midway-Andrew Transmission Project was \$120-\$150 Million. The Project was approved under the following justification:

“The Midway-Andrew 230 kV Project will fully mitigate the voltage collapse problems presently observed in the Mesa and Divide 115 kV system and protect against approximately 270 MW of load drop following loss of any two of the 230 kV sources at the Mesa substation (Category C5, C2 and C3 outages). For the Divide area, the project will avert system voltage collapse and protect against approximately 145 MW of load shedding following loss of Mesa-Divide #1 & 2 115 kV Lines.”

Based on the above description for the need of Midway-Andrew 230kV Project, as well as some other approval documents, there were no single contingency violations supporting the need for the Midway-Andrews transmission project. Midway-Andrew 230kV Project mitigates contingencies associated with a loss of two transmission elements around the Mesa 230kV Substation. This is a low probability event for which the CAISO Planning Standards allow for the controlled interruption of load in non-urban areas. Currently there is an SPS in place to protect against the described risk of voltage collapse and thermal overloads. When the project was initially approved, BAMx asserted that the system was in compliance with the applicable reliability criteria and additional improvements should be subject to a cost/benefit assessment. More recent estimates reflect an increase of over 350% to \$600-\$700 million.⁶ This accentuates BAMx's previous comments and spotlights the question of how much is reasonable to spend to improve the reliability to an area that already meets the system performance requirements. BAMx recommends that this project be held indefinitely until a framework is in place to address this question.

Northern Fresno 115kV Area Reinforcement

The Northern Fresno Reinforcement Project was also approved during the 2012-2013 Transmission Planning Cycle. The cost estimate from the request window application submitted by PG&E for the project was \$110 to \$190 Million. The following was provided as a justification to build this project⁷:

“A fault on the 230 kV bus tie breaker at McCall substation would cause overloads of up to 126% on 4 facilities and low voltage throughout Southern Fresno. McCall UVLS would initiate for this contingency and drop 260 to 290 MW of load. An additional 50 MW of load may need to be dropped via SCADA to alleviate overloads of the Herndon-Barton and Herndon-Manchester 115 kV lines.”

⁶ Costs from Quarterly Project Status Report of Pacific Gas and Electric Company dated January 2, 2017.

⁷ Northern Fresno Request Window application submitted during the 2012-2013 TPP.

“There are several other outages that lead to overloads. During peak the Herndon 230/115 kV transformers #1, #2 and #3, McCall 230/115 kV transformers #1, #2 and #3, Herndon-Barton 115 kV line and Herndon-Manchester 115 kV line all overload for NERC category C2 and C3 (N-1-1) outages. In order to take clearances at McCall extensive switching would need to be performed to radialize the 115 kV system. This would make routine maintenance difficult, expensive and would significantly increase the risk of customer outages.

The Northern Fresno 115 kV Area Reinforcement project will strengthen the system so that it can withstand the Herndon 230 kV bus tie breaker fault without relying on SPS or dropping any load. The system will also be strengthened enough to withstand the McCall 230 kV bus tie breaker fault and will mitigate overloads on 20 additional facilities resulting from at least 10 separate contingencies. This project will also increase operating flexibility, load serving capability, customer reliability and reduce losses. The impact on Helms pumping capability will be negligible.”

Similar to Midway-Andrew 230 kV Project, this project is being justified to avoid dropping load in non-urban areas for multiple contingency events. Also similar to the Midway-Andrew 230 kV Project, the cost estimate has increased by over 250% to \$600 Million-\$700 Million. Again, BAMx recommends that this project be held indefinitely until a framework is in place to address the question of how much is reasonable to spend to improve the reliability to an area that already meets the system performance requirements.

As part of the review of the previously approved projects whose reliability need is driven by multiple contingency events, the review should identify those areas where non-consequential load dropping is allowed under the CAISO Planning Standards. Where an alternative is selected that provides a higher level of service than identified by the standards, a quantitative justification should be included as to how the customer benefits exceed the costs. (This is similar to the type of analysis already required by the CAISO Planning Standards for reliability versus cost assessments.⁸)

Other Projects Recommended For Re-Evaluation

In addition to the 13 projects cancelled and an additional 16 projects placed on hold in this transmission planning cycle, BAMx recommends that further investigation is merited for the following previously approved projects:

Diablo Canyon Voltage Support Project

The Diablo Canyon Voltage Support Project was approved during the 2012-13 Transmission Planning Cycle. The project entails building a Static Var Compensator at the Diablo Canyon Substation. The need for the project was to address low voltages below 0.90 pu after a double

⁸ See CAISO Planning Standards Section II.5 *Planning for New Transmission Versus Involuntary Load Interruption Standard*

contingency outage of Morro Bay-Diablo 230kV circuit in addition to Morro Bay – Mesa 230kV circuit. In addition the project is to assist in PG&E meeting NERC *NUC-001-2*.⁹ Based on BAMx analysis conducted on the latest CAISO Summer Peak and Winter Peak 2026 cases, the post contingency voltages at Diablo Canyon and surrounding buses are substantially above the 0.90 threshold without the Diablo Canyon Voltage support project in service, therefore BAMx would recommend the CAISO evaluate the project for cancellation. Also, if the project is needed to meet *NUC-001-3* NPIRs and given the announced retirement plans for Diablo Canyon, there is an issue of potential stranded costs. If this project does proceed, Diablo Canyon Power Plant should be responsible for the stranded project costs upon Diablo Canyon's retirement.

Metcalf Evergreen 115kV Lines

The Metcalf-Evergreen Reconductoring Project is located in the San Jose area and was approved in 2002 with a scope to reconductor both circuits between Metcalf substation to Evergreen Substation with a 477 kmil SSAC. The justification for the project was an overload on one of the Evergreen-Metcalf circuits for the loss of the other circuit. However, the latest reliability results produced by the CAISO do not show any overloads on the Metcalf-Evergreen circuit for this or any other contingency. Also, applying this contingency to the latest Summer and Winter 2026 Peak cases did not produce loadings in excess of current conductor ratings. The CAISO assessment did show some value of this project in mitigating P6 (*N-1-1*) overloads on the Trimble-San Jose 'B' 115 kV line. If this is the only driver however, it would appear questionable whether reconductoring 21 circuit miles of the Metcalf-Evergreen line to avoid upgrading the 3.4 mile Trimble-San Jose 'B' 115 kV line is a reasonable solution. BAMx recommends that the CAISO re-evaluate the need for the Metcalf-Evergreen Reconductoring Project.

Special Study – 50 Percent Renewable Energy

Adequacy of Existing Transmission Infrastructure to Meet 50% RPS Goal

BAMx is highly encouraged by the findings of the investigation into the feasibility and implications of using energy-only procurement to integrate the additional renewable resources necessary to meet California's 50% RPS goal. In addition to the report's recognition that the need for future renewable generation to provide system resource adequacy capacity is diminishing, BAMx notes that the study demonstrates that the maximum of 15,000 MW of incremental renewables needed in the CAISO balancing authority area to transition from 33% to a 50% RPS goal can be accommodated on the existing transmission without any major issues barring certain potential reliability issues in the Tehachapi, Mountain Pass and Eldorado, VEA and Nevada SW zones. BAMx believes that this information should be fed into the CPUC RPS Calculator or the future Integrated Resource Planning (IRP) capacity expansion tool to develop more refined resource portfolios to avoid such potential reliability issues going forward.

⁹ Note that this requirement has been replaced by NUC-001-3 whereby the Nuclear Plant Operator and the Transmission Entities (in this case PG&E and the CAISO) shall have an agreement in place addressing Diablo Canyon's Nuclear Plant Interface Requirements (NPIRs) ensuring nuclear plant safe operation and shutdown.

Renewable Curtailment Primarily Driven By Oversupply Rather Than Lack of Transmission

The availability of congestion and curtailment information, such as presented, is important for the market to make informed resource development and selection decisions. One of the major takeaways of the 50% RPS Special Study that the renewable curtailment in all the portfolios were found to be over-supply related rather than transmission related. In other words, these 50% RPS Special studies indicate that building additional transmission may not be a suitable solution to reduce the level of potential renewable curtailments. Rather the ability of the CAISO to export excess renewable energy during a certain period would have a much more significant impact in terms of reducing the level of curtailments. In other words, the ability to manage and export surplus resources is critical to the integration of high penetrations of in-State solar resources. BAMx, therefore, supports increasing use of the interties in the studies to expand exports during times of over-generation.

Need to Account for Authentic ELCC-based Deliverability Dispatch

Regarding the CAISO's attempt to incorporate "Effective Load Carrying Capacity (ELCC)-based deliverability dispatch into deliverability assessment¹⁰," this proposal calculates the expected renewable generation within a three-hour window around the shifted system peak that results from increased behind-the-meter generation. We understand the CAISO has applied its current exceedance-based deliverability methodology to the resultant expected renewable generation during this three-hour window. BAMx notes, while the proposal is a step toward reflecting the impact of the time shift in the system peak load in the deliverability determination, it does not itself incorporate any probabilistic reliability modeling inherent in an ELCC calculation. As such, the final 2016-17 transmission plan must carefully and properly ensure that the description of the CAISO studies make clear that deliverability methodology itself is not ELCC based.

Table 1 compares the current wind and solar exceedance factors in the SCE area in 2026 assumed in the CAISO generation interconnection studies and Net Qualifying Capacity (NQC) studies with those assumed in the CAISO's 50% RPS Special study with the *ELCC* amounts utilized in the CPUC RPS Calculator Version 6.2. Although the *Peak Shift NQC* value (31%) for PV is lower than the *Current NQC* values (92%-93%), they are not as low as they would be based upon the ELCC calculations. Furthermore, although the wind *ELCC* values (14%-28% range) are considerably lower than the *Current* exceedance values (38%-47%), the *Peak Shift* values used in the 50% RPS Special study at 60% are even higher than the *Current* exceedance values.

¹⁰ See slide #6 of 50% RPS Special Study– In-state Results and Status of Out of State Studies, 2016-2017 Transmission Planning Process Stakeholder Meeting, February 17, 2017.

Table 1: Comparison of Wind and Solar Exceedance Factors in the SCE Area in 2026

Technology	Current 50% Exceedance	Peak Shift 50% Exceedance	ELCC*
Wind	38% - 47%	60%	14%- 28%
Solar PV	92% - 93%	31%	2%

*Source: Marginal ELCC as reported in the CPUC RPS Calculator Version 6.2, *ELCC_Interp* tab

The transition to ELCC resource counting reflects the shortcomings of the existing exceedance methodology for RA counting as the renewable penetration increases.¹¹ Therefore, BAMx is concerned that the CAISO proposes to maintain the exceedance methodology contained in its general deliverability methodology even while transitioning the resource counting used as an input to the CAISO studies. CAISO needs to address why, in order to comply with this state mandate, the deliverability methodology is not being aligned with the resource counting methodology.

Need to Better Understand Whether EODS Truly Has More Reliability Issues Than FCDS

The CAISO, during the February 17th stakeholder meeting, observed that the in-state Energy Only Deliverability Status (EODS) portfolio has more severe reliability issues than the in-state Full Capacity Deliverability Status (FCDS) portfolio.¹² BAMx notes that these two portfolios have a very similar amount of resources selected in the Tehachapi zone, i.e., 3,625MW (in-State FCDS) and 3,791MW (in-State EODS). It is not clear why only 166MW of incremental renewable resources in the in-State EODS portfolio results in several additional *N-1-1* overloads.¹³ BAMx requests the CAISO to provide some additional insights into this apparent anomaly.

Need to Update the Transmission Capability Data Going Forward

The CAISO provides information to the CPUC RPS Calculator regarding the capability of the existing transmission to accommodate fully deliverable and energy-only resources in each transmission area. It also provides information on the amount of new fully deliverable and energy-only resource capacity that can be incrementally accommodated with additional delivery network upgrades. BAMx encourages the CAISO to provide the very useful information that it has gathered characterizing transmission cost and availability for fully deliverable and energy-only resources to update the RPS Calculator or the future Integrated Resource Planning (IRP) capacity expansion tool. For example, the current version (6.2) of the RPS Calculator, which assumes that 2,628MW of fully deliverable (or 3,794MW energy-only) resources can be accommodated in the Tehachapi zone on the existing transmission.¹⁴ Meanwhile data developed

¹¹ Effective Load Carrying Capacity and Qualifying Capacity Calculations Methodology for Wind and Solar Resources, Staff Proposal, Resource Adequacy Proceeding R.11-10-023 California Public Utilities Commission – Energy Division January 16, 2014.

¹² Slides #23-27 See slide #6 of 50% RPS Special Study– In-state Results and Status of Out of State Studies, 2016-2017 Transmission Planning Process Stakeholder Meeting, February 17, 2017

¹³ *Ibid*, Slide #24.

¹⁴ RPS Calculator version 6.2, *CAISO_Tx_Inputs* tab.

under the RETI 2.0 efforts indicates an availability of 4,500MW (5,600MW).¹⁵ Information from these most recent CAISO studies should be used ensure that the RPS calculator utilizes the most current information.

BAMx appreciates the opportunity to comment on the CAISO Draft 2016-17 Transmission Plan. BAMx would also like to acknowledge the significant effort of the CAISO staff to develop the Draft Plan, as well as the staff's willingness to work with the stakeholders in the process to more fully develop it. We hope to work with the CAISO staff to continue to improve and enhance its capabilities.

If you have any questions concerning these comments, please contact Kathleen Hughes (khughes@SantaClaraCA.gov or (408) 615-6632.

¹⁵ Table ES-2. Summary of Existing and Proposed TAFE Generation and Transmission in the Renewable Energy Transmission Initiative 2.0 Plenary Report, December 16, 2016.