

BAMx Comments on the White Paper dated June 28, 2023, and July 5, 2023 Stakeholder Call discussion

Updated Transmission Capability Estimates for Use in CPUC's Resource Planning Process

1. Introduction

On July 5, 2023, the CAISO held a stakeholder call to provide Updated Transmission Capability Estimates for Use in California Public Utilities Commission's (CPUC) Resource Planning Process. The CAISO issued a detailed white paper (2023 White Paper, hereafter) on this topic on June 28, 2023. The Bay Area Municipal Transmission group (BAMx)¹ appreciates the opportunity to comment on this topic. BAMx applauds the CAISO staff's efforts in updating the transmission capability estimates for use in CPUC's Resource Planning Process and seeks additional details of the CAISO's calculations as elaborated below. In addition to the 2023 white paper dated June 28, 2023, the CAISO also provided the following supporting material.

1. An *Excel* spreadsheet includes the Transmission Capability Estimates for Use in CPUC's Resource Planning Process (TCE spreadsheet, hereafter);
2. Attachment B1 comprises the Deliverability Constraint Boundary Diagrams (DC Boundaries, hereafter); and
3. Attachment B2 comprises the PG&E Constraint Boundary Substation List (Substation List, hereafter).

BAMx found this supporting material quite helpful in understanding the transmission capability estimates. BAMx encourages the CAISO to update the transmission cost estimates with a greater frequency, that is, annually. We also urge the CAISO to expand Attachment B2 to include the SCE, SDG&E, and VEA/GLW areas. BAMx has identified several issues based on its review of the updated transmission cost estimates. In the remaining comments, we raise them one by one. It is essential that the CAISO and CPUC provide an adequate stakeholder process for others to engage more frequently to provide meaningful and helpful stakeholder engagement. The current process confined to two-way communication between the CAISO and the CPUC is insufficient. Lacking such a process, it is especially important that the CAISO address our concerns below and provide updated transmission capability estimates to the CPUC.

2. Simplify and Update the Transmission Capability Estimates by Treating the CAISO TPP-Approved Transmission Projects Similar to the Existing Transmission

The transmission capability estimates have not incorporated the 2021-22 and 2022-23 Transmission Plan approvals.² For example, the incremental transmission capability due to the TPP-approved Area Delivery Network Upgrades (ADNU), such as the New Collinsville 500/230 kV substation and New Manning 500/230 kV Substation, are identified in the 2023 White Paper, as shown in Table 1. However, since these projects are TPP-approved projects, presumably, their cost should not be considered by the CPUC in its resource planning/selection process. Therefore, the CAISO should

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

² 2023 White Paper p.4.

expand the Transmission Plan capability amounts for the constraints shown in Table 1 below to include the incremental capability added by the previously-approved TPP projects.

Table 1: Transmission Capability Estimates for TPP-Approved Projects

Transmission Constraint	Affected Resource Locations	Condition Under Which Constraint is Binding (On-peak and/or Off-peak)	Estimated FCDS Capability Based on On-peak Study Resource Output (MW)**		ADNU & Cost Estimate (\$million)	
			Transmission Plan Capability***	Incremental due to ADNU	ADNU (Time to Construct)	Cost (2022\$)
Dumbarton-Newark 115 kV line	Greater Bay Area and North of Greater Bay Area	On-Peak	1,270	978	New Collinsville 500/230 kV substation (2028)	N/A (TPP approved project)
Panoche-Los Banos 230kV line #2	Fresno	On-Peak, Off-Peak	206	6,367	New Manning 500/230 kV Substation (2028)	N/A (TPP approved project)

The TCE spreadsheet identifies the following five ADNUs that add to the full capacity deliverability status (FCDS) capability to address the *Serrano-Alberhill-Valley Constraint* by 6,000MW, as shown in Table 2 below. Out of these upgrades, three projects in **bold** were approved in the CAISO 2022-2023 Transmission Plan. How does the CAISO expect the CPUC to utilize this data where part of the \$1.234 million cost (see Table 2) includes the cost associated with the TPP-approved projects? In other words, if the CPUC should only use the cost of the two new projects, that is, the New Devers-Mira Loma 500 kV line and Upgrade Mira Loma-Vista No. 2 220kV line, to add FCDS capacity to address the *Serrano-Alberhill-Valley Constraint*, then that cost, as well as the incremental FCDS capacity (presumably a subset of the 6,000MW shown in Table 2), needs to be identified.

- i. New Devers-Mira Loma 500 kV line,
- ii. **Mira Loma-Mesa 500kV Underground Cable Addition,**
- iii. **Upgrade San Bernardino-Vista 220 kV line,**
- iv. **Upgrade Etiwanda-Vista 220 kV line,** and
- v. Upgrade Mira Loma-Vista No. 2 220kV line

Table 2: Transmission Capability Estimates for Serrano-Alberhill-Valley Constraint

Transmission Constraint	Affected Resource Locations	Condition Under Which Constraint is Binding (On-peak and/or Off-peak)	Estimated FCDS Capability Based on On-peak Study Resource Output (MW)**		ADNU & Cost Estimate (\$million)	
			Transmission Plan Capability***	Incremental due to ADNU	ADNU (Time to Construct)	Cost (2022\$)
Serrano-Alberhill-Valley Constraint	SCE Eastern and SDG&E areas	On-Peak, Off-Peak	5,328	6,000	New Devers-Mira Loma 500 kV line, Mira Loma-Mesa 500kV Underground Cable Addition, Upgrade San Bernardino-Vista 220 kV line, Upgrade Etiwanda-Vista 220 kV line, Upgrade Mira Loma-Vista No. 2 220kV line (9 years)	\$1,234

The CAISO 2022-23 Transmission Plan also approved another project: Serrano-Alberhill-Valley 500 kV 1 Line Upgrade.³ It is not clear what role this project played in expanding the FCDS and Energy Only (EO) capacity of the Serrano-Alberhill-Valley Constraint. The CAISO needs to fully explain this amount.

Without the above-mentioned additional information, CPUC will not be able to meaningfully interpret the transmission cost capability data.

3. Provide Additional Guidance to CPUC For Selecting Capacity Beyond Identified ADNUs

³ Board Approved CAISO 2022-23 Transmission Plan, May 10, 2023, p.6.

The CPUC's 2023-2024 TPP resource portfolio selected resources behind certain constraints beyond the existing and identified ADNU-driven capacities. If the portfolio resources could not fit within the existing capabilities and defined expansions, it was not clear what assumptions were used about the relative costs of additional expansions to map the remaining resources.⁴ The implication is that the 2023-2024 Transmission Plan will potentially identify policy-driven network upgrades that were not anticipated or factored into the CPUC's resource portfolio development. It is, therefore, critical that the CAISO provides additional guidelines to the CPUC in this update so that CPUC can fully assess the cost impact of exceeding the capabilities beyond the identified expansions behind each transmission constraint.

4. CAISO Needs to Provide Intermediate Level of ADNUs, Associated Capabilities, and Costs

BAMx noticed that several ADNUs identified by the CAISO in the 2023 White Paper are lumpy. For example, for the *Midway-Q2005 230kV Line* constraint, the CAISO has identified an ADNU [Re-conductor and reconfigure Gates-Arco-Midway 230 kV Lines] with an incremental capability of 16,891MW. However, this ADN costs as high as \$940 million. Another example is the *Vaca Dixon-Tesla 500kV Line* constraint, where the ADNU [500kV Delevan project] costs as high as \$2,852 million.⁵ We understand that some of these upgrades have been identified as part of the Cluster 14 Phase I studies, which have a significantly higher level of generation modeled than needed to meet the State policy goals in the outer years. We understand that as part of the Interconnection Process Enhancements 2023 Track 2 process⁶, there is the expectation that future Cluster studies will provide a more realistic picture of the needs for transmission. Lacking such a result for Cluster 14, we encourage the CAISO to use Engineering judgement to provide more meaningful estimates to the CPUC.

The CPUC's capacity expansion model, RESOLVE, will utilize the transmission capability estimates to choose only partial amounts that can be accommodated by the identified ADNUs in the cases described above. We understand that RESOLVE is a linear optimization model and cannot correctly analyze all-or-nothing transmission upgrade decisions.⁷ RESOLVE's selection of a partial transmission upgrade ignores the real world where a specific transmission project is either built or not built. Transmission additions are very lumpy. RESOLVE's assumptions of linear/incremental transmission upgrades and associated generating resources that depend on them are problematic. Therefore, it is essential that the CAISO provides them with ADNUs that are intermediate in scope and cost.

5. Need to Better Understand the Impact of Certain ADNUs

The ADNU entailing the New Collinsville 500/230 kV substation, which was approved in the CAISO 2021-2022 Transmission Plan, seems to be effective in addressing the Dumbarton-Newark 115 kV line transmission constraint as it expands the capability to add the FCDS wind resources by 978MW in the Greater Bay Area and North of Greater Bay Area. See Table 3 below. Are there any additional

⁴ BAMx's comments on the 2023-2023 TPP Study Plan, dated March 14, 2023, showed that for thirteen (13) constraints, the CPUC-provided Base portfolio of resources in the year 2035 exceeded the FCDS capability of the existing plus the ADNUs identified by CAISO with a total of 15,797MW.

⁵ TCE Spreadsheet.

⁶ <https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses/Interconnection-process-enhancements-2023>

⁷ Commission, Integrated Resource Planning (IRP) Proposed Preferred System Plan Analysis Workshop, September 1, 2021, slide #83.

transmission constraints that are addressed by the New Collinsville 500/230 kV substation? If so, please include them in the transmission capability tables.

Table 3: Transmission Capability Estimates for Dumbarton-Newark 115 kV line Constraint

Transmission capability estimates for use in the CPUC's IRP process - Revised 6/28/2023						
Transmission Constraint	Affected Resource Locations	Condition Under Which Constraint is Binding (On-peak and/or Off-peak)	Estimated FCDS Capability Based on On-peak Study Resource Output (MW)**		ADNU & Cost Estimate (\$million)	
			Transmission Plan Capability***	Incremental due to ADNU	ADNU (Time to Construct)	Cost (2022\$)
Dumbarton-Newark 115 kV line	Greater Bay Area and North of Greater Bay Area	On-Peak	1,270	978	New Collinsville 500/230 kV substation (2028)	N/A (TPP approved project)

6. Need to Explain Changes from Last Transmission Capability Estimates Update

BAMx systematically compared the last transmission capability estimates (2021 White Paper, hereafter) used in developing the 2022-2023 TPP and 2023-2024 TPP resource portfolios and the latest estimates (2023 White Paper).⁸

i. Significant changes in cost estimates and capability estimates:

- Per the 2021 White Paper, the ADNU of the Wilson-Storey-Borden #1 and #2 230kV lines (50 months) were expected to cost \$232 million.⁹ Now that amount is reduced to \$75 million.¹⁰ The Incremental FCDS Capability Attributed to ADNU has also increased from 96MW to 3,895MW. BAMx questions whether these changes in the CAISO's assessment are reasonable. It will not be a cost-effective outcome if the CPUC selects a considerable amount of resources behind the Wilson-Storey-Borden #1 & #2 230 kV Lines constraint based on these capability estimates, and then if the CAISO transmission plan identifies ADNUs beyond the Wilson-Storey-Borden #1 and #2 230kV lines. Therefore, BAMx requests the CAISO to confirm these amounts and fully explain these changes.
- Another example is for the Los Banos 500/230kV TB constraint; the earlier amount that could have been accommodated on the existing transmission was 1,127MW.¹¹ Now it has been updated to 3,930MW.¹² This increase in the capability amount is not driven by the New Manning 500/230 kV Substation, as it is identified to add another 4,931MW in the Fresno area.¹³
- Another example is the Moss Landing-Las Aguilas 230 kV Line constraint, where the capability of accommodating FCDS resources behind this constraint seems to have increased from 316MW¹⁴ to 2,276MW.

ii. The 2023 White Paper does not include some of the constraints identified in the 2021 White Paper

- The 2021 White Paper had identified the Los Banos-Gates 500 kV constraint for the off-peak period, whereas the 2023 White Paper includes a new Q2008-Gates 500 kV line constraint for both on and off-peak periods. This seems to be a separate constraint that is part of the Diablo-Gates 500 kV line. Please confirm if that is the

⁸ CAISO Transmission Capability Estimates for use in the CPUC's Resource Planning Process White Paper, July 19, 2021

⁹ *Ibid.*, Table 3-1: Updated transmission capability estimates.

¹⁰ TCE Spreadsheet.

¹¹ 2021 White Paper, Table 3-1: Updated transmission capability estimates.

¹² TCE Spreadsheet.

¹³ *Ibid.*

¹⁴ 2021 White Paper, Table 3-1: Updated transmission capability estimates.

- case. Please explain why we do not have any limitations on the Los Banos-Gates 500kV line in the off-peak period to accommodate EO Westlands/Los Banos areas.
- b. The 2021 White Paper identified the Warnerville-Wilson 230 kV constraint in the off-peak period, which is missing in the 2023 White Paper. Please explain why the Warnerville-Wilson 230 kV is no longer a constraint to accommodate EO resources in the Westlands area.
 - iii. Identify whether the capability estimates are based on HSN or SSN assessments:
Presumably, the transmission capability estimates tables show the amounts based on whichever conditions are more binding, i.e., either High System Need (HSN) or Secondary System Need (SSN). We request the CAISO to identify whether every constraint is identified under HSN or SSN, or both.

In summary, BAMx has many questions based on the above comments. We are not confident that a one-time written response from the CAISO will be sufficient. Therefore, we encourage the CAISO to consider another stakeholder call to review the contents of the updated whitepaper.