Submit comment on November 18, 2021, stakeholder meeting

2021-2022 Transmission planning process

1. Please provide your organization's comments on the Preliminary Policy Assessment, as described in the second portion of the presentation:

BAMx applauds the CAISO staff's efforts in relying on the implementation of Remedial Action Schemes (RAS) and storage solutions in its Preliminary Policy Assessment. As shown in Table 1 compiled by BAMx below, the CAISO has effectively and rightfully utilized the existing/planned RAS dispatching portfolio battery storage in charging mode, and including new battery storage as mitigations wherever applicable to mitigate the contingency overloads.

Table 1: Recommended Non-Wires Mitigations*

Constraint	Area	Recommended Mitigation
On-peak Windhub 500/230 kV transformer	SCE	Planned Windhub CRAS
On-Peak Red Bluff –Devers 500kV	SCE	West of Colorado River CRAS
Off-Peak Windhub 500/230 kV transformer	SCE	Planned WindhubRAS/ Baseline and portfolio battery
On-Peak Doublet Tap-Friars 138 kV	SDG&E	Planned RAS to trip Otay Mesa area gen
On-Peak San Marcos-Melrose Tap 69 kV	SDG&E	Existing/modified TL684 RAS to open Melrose Tap-San Marcos 69 kV
On-Peak Encina-San Luis Rey 230kV	SDG&E	Planned RAS to trip Encina
On-Peak San Luis Rey-San Onofre 230 kV	SDG&E	Planned RAS to trip Encina
On-Peak Round Mountain-Fern Road #1 and #2 500kV	PG&E	RAS to bypass the series capacitor on the remaining line
Off-Peak Kettlemen-Gates 70kV	PG&E	Turn on Portfolio Battery Storage
Off-Peak Kern-Tevis-Stockdale 115kV	PG&E	Turn on Portfolio Battery Storage
Off-Peak Gates 500/230kV Bank	PG&E	Turn on Portfolio Battery Storage

*Source: November 18th Presentation, "2021-2022 TPP Policy-driven Assessment," pp. 30-55.

BAMx encourages the CAISO to consider the combinations of such non-wires mitigations in its future assessment. For instance, in the case of both the Encina-San Luis Rey 230 kV and San Luis Rey-San Onofre230 kV constraints, the CAISO indicated that planned RAS to trip Encina was not sufficient in the Secondary System Need (SSN) scenario under the two sensitivity portfolios, and therefore new 230kV lines might be required to address P7 contingencies.[1] In such cases, a

[1] See November 18th Presentation, "2021-2022 TPP Policy-driven Assessment," pp. 46-48.

combination of RAS and relocation of battery storage should be considered as potential mitigation solutions. Since these two projects are expected to be identified as Category 2 policy-driven projects[2], BAMx encourages the CAISO to consider such mitigation solutions in the next planning cycle.

Furthermore, in the case of some transmission projects that the CAISO staff is considering recommending for approval as Category 1 policy-driven projects, it is not clear to BAMx why relocating battery storage is not an effective mitigation. For example, for the On-Peak Fulton 60kV lines constraint, it is clear that there is no energy storage portfolio behind the constraint where only 0MW to 40MW of baseline and portfolio resources remain undelivered in the Base and the two sensitivity portfolios. However, it is not clear to us why relocating battery storage, that is, adding battery storage behind the constraint, is not an appropriate mitigation solution. We encourage the CAISO staff to continue to investigate less costly mitigations for such projects. Until then, these projects should not be identified as Category 1 policy-driven projects.

BAMx acknowledges the tremendous amount of effort by the CAISO staff in identifying the interconnection transmission alternatives, the onshore network, and additional transmission upgrades that might be required to address the capacity issue of transferring OffShore (OS) wind out of the Diablo/Morro Bay area and the Humboldt Bay area.[3] It is critical that the CAISO develops capital cost estimates for all different types of transmission upgrades required for offshore wind development to inform stakeholders as soon as possible. It is very important that the CPUC IRP team use this information to develop resource portfolios for the CAISO 2022-2023 TPP in a timely manner. The transmission costs, including the cost of all connection facilities and the potential network upgrades scope and cost information, need to be transferred for the base and sensitivity portfolios, including the required additional transmission to accommodate the OS wind.

Similar additional transmission cost information needed to accommodate the Out-of-State (OOS) wind should be communicated to the CPUC IRP team. For example, the Off-Peak deliverability assessment identified worse overloads on the Eldorado-McCullough 500 kV tie-line with 1,062 MW OOS wind at Eldorado in the Base Portfolio compared with that injection at Palo Verde.[4] In other words, the Wyoming/Idaho wind tends to trigger more transmission costs than the New Mexico wind over and above the major transmission upgrades that are needed to get the OOS wind resources to the CAISO border. This exercise will validate whether the selection of 1,500MW of OOS wind and 1,708MW of OS wind, originally selected by the RESOLVE model in the CPUC's 38MMT Core portfolio considered in its Proposed Preferred System Plan (PSP)[5], is economically justified. **It is important that all types of transmission costs associated with OS/OOS wind are accurately captured to adequately evaluate the cost-effectiveness of the OS/OOS wind resources relative to the competing In-State and other OOS renewable resources.**

2. Provide your organization's comments on the Preliminary Economic Assessment, as described in the third portion of the presentation:

At this time, BAMx has no comments on this topic.

[2] Since they are found to be needed only in the sensitivity portfolios.
[3] See November 18th Presentation, "2021-2022 TPP Policy-driven Assessment," pp. 70-81.
[4] See November 18th Presentation, "2021-2022 TPP Policy-driven Assessment," p.89.
[5] Rulemaking 20-05-003, ALJ Ruling Seeking Comments on PSP, August 17, 2021, p. 16.

3. Provide your organization's comments on Reliability Projects less than $50 million, as described in the fourth portion of the presentation:

Out of the six projects the CAISO is considering for approval included in Table 2 below, energy storage options were evaluated as an alternative to transmission solutions for the three projects highlighted in yellow. The energy storage mitigation options were rejected as they were not found to be economically attractive due to PG&E's added costs to upgrade the involved substations to a breaker-and-a-half (BAAH) configuration.

Table 2: Less than $50 Million Project Approvals and Project for Concurrence**

#	Project Name	Area	NERC Criteria Vilolation	Energy Storage Considered & Rejected	Project Cost
1	Contra Costa 230 kV Line Terminals Reconfiguration	GBA	P2 starting 2023	N/A	$5M - $10M
2	Vasona-Metcalf 230 kV Line Limiting Elements Removal Project	GBA	P2 and P7 starting 2023	Yes, not cost-effective	$0.6M - $1.2M
3	Coppermine 70 kV Reinforcement Project	GBA	P0 overloads based on historical data	Yes, not cost-effective	$21.8M - $43.6M
4	Cortina 230/115/60 kV Bank #1 Replacement	Sacramento	P1 starting 2023	N/A	$21M - $42M
5	Manteca-Ripon-Riverbank-Melones Area 115 kV Line Reconductoring	Stockton	P1 starting 2023	N/A	$6.8M - $13.6M
6	Weber - Mormon Jct 60 kV Line Section Reconductoring	Stockton	P0 starting 2023	Yes, not cost-effective	$9.3M - $18.6M
Total (M$)					**$64.5M - $129M**

**Source: 2021-2022 Transmission Planning Process, PG&E Area, Less than $50 Million Project Approvals and Project for Concurrence, November 18, 2021, pp.2-8.

BAMx encourages the CAISO staff to look for innovative methods to connect storage when the standard method triggers major interconnection costs, including the three projects above where storage as an option was rejected. BAMx recommends the Staff consider the connection to the area distribution system as one method to be considered. If that increases battery installation costs, those increased costs could be considered as incremental interconnection costs and treated appropriately.

PG&E's Cortina 230/115/60 kV Bank #1 Replacement Project proposed replacing the existing Cortina Bank #1 with two transformers (a 230/115 kV and a 115/60 kV unit), a project cost of $21 million to $42 million. BAMx encourages the CAISO staff to evaluate an alternative that replaces the existing Cortina Bank #1 with a 200 MVA 230/60 kV transformer. The existing Cortina Bank #1 is operated as a 230/60 kV transformer with its 115 kV winding disconnected from the CAISO grid.

According to the CAISO reliability assessment, the 230/60 kV winding of the Cortina #1 transformer is forecasted to be overloaded. Replacing the existing Cortina Bank #1 with a 200 MVA 230/60 kV transformer appears to be the most direct and cost-effective means to mitigate the forecasted overload.

4. Provide your organization's comments on the PG&E Area High Voltage Assessment (update), as described in the fifth portion of the presentation:

At this time, BAMx has no comments on this topic.

5. Provide your organization's comments on the 20 Year Transmission Outlook (update), as described in the final portion of the presentation:

BAMx supports the CAISO's broad objectives for the 20-Year Transmission Outlook Initiative. BAMx appreciates the update provided on November 18th regarding the two steps identifying the transmission alternatives to potentially meet SB100 goals. Step 1 entailed transmission facilities to integrate the resources in the SB100 starting point, whereas step 2 included transmission facilities needed to get from resource areas to the load centers. BAMx acknowledges that the transmission paths, especially those explored under step 2, are only for illustrative purposes at this time. However, it is important that the CAISO soon develop rough cost estimates for all transmission facilities needed under step 1 and step 2. Without such cost estimates made available in the current timeframe, the policymakers and stakeholders at large will not be able to assess their impact in refining long-term resource planning.

6. Provide additional comments (if any) on the November 18, 2021, stakeholder meeting:

No comments at this time.