

The CAISO received comments on the topics discussed at the April 9, 2024 stakeholder call from the following:

- A. ACP – California
- B. AES
- C. Bay Area Municipal Transmission Group (BAMx)
- D. California Community Choice Association
- E. California Public Utilities Commission - Energy Division
- F. California Public Utilities Commission - Public Advocates Office
- G. California Wind Energy Association
- H. Catherine Buchanan
- I. CEERT and LEAP
- J. County of Humboldt
- K. Equinor US LLC
- L. Fervo Energy Company
- M. Golden State Clean Energy
- N. LS Power
- O. LSA
- P. Northern California Power Agency
- Q. Offshore Wind California
- R. Redwood Region Partners
- S. RWE Renewables
- T. San Diego Gas & Electric
- U. San Francisco Public Utilities Commission
- V. Silicon Valley Power
- W. Smart Wires Inc.
- X. Sonoma Clean Power Authority
- Y. Southern California Edison
- Z. Tejon Ranch Company
- AA. Transmission Agency of Northern California
- BB. Vineyard Offshore, LLC
- CC. Pacific Gas & Electric
- DD. Natural Resources Defense Council, Inc.

Copies of the comments submitted are located on the Transmission Planning Process page at:

<https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses/2023-2024-Transmission-planning-process>

The following are the CAISO's responses to the comments

1. Please provide your organization's comments on Reliability-driven Projects Recommended for Approval.
2. Please provide your organization's comments on Frequency Response.
3. Please provide your organization's comments on Maximum Import Capability Expansion Requests.
4. Please provide your organization's comments on Policy-driven Projects Recommended for Approval.
5. Please provide your organization's comments on the Economic Assessment.
6. Please provide your organization's additional comments on the Draft 2023-2024 Transmission Plan April 9, 2024 stakeholder call discussion.

1. Please provide your organization's comments on Reliability-driven Projects Recommended for Approval

No	Submitting Organization	Comment Submitted	CAISO Response
1A	ACP-California	<p>ACP-California appreciates CAISO's diligent work on the 2023-24 Draft Transmission Plan and supports the recommended approval of the Reliability-driven transmission projects. These projects will mitigate reliability constraints in various parts of the system, including supporting development of diverse resources (such as geothermal in the southwest) which are included in the CPUC's resource portfolio. To ensure these upgrades are completely in a timely manner, ACP-California reiterates its request for CAISO to work closely with the CPUC and the PTOs to identify potential delays earlier in the process and to provide detailed status updates to stakeholders to facilitate more proactive planning and evaluation of mitigation strategies to bring clean energy resource online in a more timely manner.</p>	Your comments are noted.
1B	AES	<p>AES appreciates the opportunity to submit comments on the 2023-2024 Draft Transmission Plan. Regarding the PG&E area, the CAISO recommends numerous reinforcements and reconducting reliability projects for approval.¹ AES urges the CAISO to consider storage as transmission assets (SATAs) alternatives for these reinforcement and reconducting reliability projects. SATAs provide a more timely and cost-effective implementation that can help mitigate the identified contingencies and overloads. Specifically, AES recommends the CAISO to consider SATAs for the following reinforcement and reconducting reliability projects:</p> <ul style="list-style-type: none"> • French Camp Reinforcement • Cortina #1 60 kV Line Reconducting Project • Salinas Area Reinforcement Project • Crazy Horse Canyon - Salinas - Soledad #1 and #2 115 kV Line Reconducting • Rio Oso - W. Sacramento Reconducting • Tejon Area Reinforcement Project • Oakland transmission reinforcement project <p>AES recommends the CAISO consider SATAs for the above reliability projects. Considering SATAs for the reliability projects</p>	<p>Storage assets were not recommended due to a combination of various factors such as load types where it's a constant load throughout the day, lack of charging capacity in the area, ageing infrastructure issues etc. The recommended projects meet the reliability needs for long term.</p> <p>The ISO is not considering SATA with market participation at this time.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>complements the CAISO's consideration of Grid Enhancing Technologies (GETs) within the draft transmission plan.</p> <p>In addition to considering SATAs for the above reliability projects, the CAISO should clarify the market role of SATAs. It is crucial given that CAISO has approved five SATAs in the transmission planning process which all may have different market treatment² Although the CAISO started the SATA policy initiative to evaluate how storage resources procured for transmission purposes could participate in the CAISO market, the initiative was not completed, and lingering questions remain. Currently, the CAISO's Business Practice Manual does not clarify the process for storage resources' participation as transmission assets.³ To successfully procure storage as a transmission asset, the CAISO should adopt a formal stakeholder initiative to identify the role of SATAs, including the process to offer SATAs, interconnection, required deliverability status, cost recovery, and LSE/IPP management</p> <p>¹ See Draft 2023-2024 TPP, pp 42-57. These projects include Salinas Area Reinforcement, Cortina #1 60kV Line Reconductoring, French Camp Reinforcement, Rio Oso-W. Sacramento Reconductoring, Vaca-Plainfield 60 kV Line Reconductoring, Camden 70kV reinforcement, Tejon Area Reinforcement, and Oakland Transmission Reinforcement</p> <p>² CAISO has approved the following SATAs in previous TPP cycles: Reedley 70kV Reinforcement Project, Oakland Clean Energy Initiative Project, Lamont Battery, Corona- Lakeville 115kV Line, and Fulton- Santa Rosa No.1 115 kV Line.</p> <p>³ CAISO BPM Version 23.0</p>	
1C	Bay Area Municipal Transmission Group (BAMx)	<p>The Bay Area Municipal Transmission Group (BAMx)¹ appreciates the opportunity to comment on the Draft 2023-2024 Transmission Plan (Draft Plan, hereafter), dated April 1, 2024. The comments and questions below also address the material presented at the CAISO Stakeholder meeting on April 9, 2024. BAMx recognizes the tremendous amount of work the</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>CAISO staff has completed in this planning cycle. BAMx also believes the CAISO staff must allow a corresponding amount of time to engage the stakeholders to explain the staff's work.</p> <p><u>Need to Scrutinize the Load Growth and Allocation</u></p> <p>Similar to the CAISO September 26th stakeholder meeting, the CAISO's April 9th presentation continues to indicate there is considerable load growth and allocation assumed in the Greater Bay area[2] as well as other planning areas within the North area. The CAISO has previously indicated it plans to employ a due process approach that entails "reviewing" and "continuing to monitor" the load forecast before firming up the need for reliability mitigation projects in the current cycle. In our September 2024 comments to the CAISO, BAMx supported the CAISO's due process approach and further recommended that the CAISO make its due diligence process transparent to the stakeholders.</p> <p>In reviewing the CAISO's draft 2023-2024 TPP, BAMx was surprised to learn that the CAISO is considering approval of the following three reliability projects at almost \$600M based on PG&E's modified demand forecast</p> <ul style="list-style-type: none"> • Salina Area Reinforcement Project (\$452.3M) • Tejon Area Reinforcement Project (\$56M) • French Camp Reinforcement Project (\$84.2M) <p>All three proposed reliability projects appear to be needed due to electric demand above and beyond the CEC's approved electric demand forecast. The CAISO Draft TPP indicated that these projects are needed because:</p> <ol style="list-style-type: none"> 1. <u>The Salinas Area Reinforcement Project</u>: "PG&E Distribution Planning has received a large number of load interconnection applications near Spenser." (p. 48, Draft CAISO TPP) 	<p>Bus level allocation of demand forecast is done by PTO and it is the CAISO's understanding that the load modeled in cases are not beyond CEC forecast, but more locational granularity is utilized based on the information from the Distribution Planning regarding the actual load interconnection requests.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>2. <u>The Tejon Area Reinforcement Project</u>: “an additional 50 MW load at San Bernard substation and 45.5 MW load at Tejon 70kV substation,” (p. 56, Draft CAISO TPP) and</p> <p>3. <u>The French Camp Reinforcement Project</u>: “Significant distribution load interconnections have been requested in this area.” (p. 54, Draft CAISO TPP)</p> <p>In the November 6, 2023 stakeholder meeting, the CAISO indicated that these three projects “Do not meet a reliability need identified by the CAISO in this TPP cycle.”[3] However, at the April 9, 2024, CAISO TPP Stakeholder meeting, the CAISO indicated it has worked with PG&E to review and confirm the load growth but offered no additional details on the CAISO’s confirmation process.</p> <p>Has the CAISO included the CEC in reviewing and confirming PG&E’s load growth data? BAMx understands that the CAISO has a long-standing practice that directs PTOs and other entities that may have new demand growth information to the CEC for processing and incorporating such information into the next CEC demand forecast and the corresponding TPP cycle. Were there overriding reasons why the CAISO is changing its practice and using PG&E’s demand growth information without the CEC’s formal approval?</p> <p>Regarding cost responsibility, BAMx understands PG&E has occasionally placed the cost responsibility of transmission upgrades on its distribution load interconnection applicants under CPUC Electric Rules 15 and 16. One example is the CPUC’s decision on cost allocation between PG&E and CalTrain. Would the CAISO exclude these three projects from its TAC? If the CAISO includes these projects, what is the CAISO’s process for determining TAC inclusion?</p> <p><u>Project approval should be considered only for fully developed project proposals.</u></p>	<p>During November stakeholder meeting, the 3 conceptual project submissions were not complete even though the need was identified. The CAISO worked with PG&E on confirming the load growth modeled and assessed various alternatives and recommended alternatives that is cost effective and meets long term need. In some cases, the recommended alternative was not a part of original alternative that PG&E proposed.</p> <p>Please see above response.</p> <p>The 230 kV and higher scope of these projects will be included in the CAISO’s high voltage TAC impact assessment.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>BAMx understands PG&E described its <i>Salinas, Tejon, and French Camp Reinforcement Project</i> as conceptual proposals. Although the reliability issues behind Salinas and French Camp were identified in the preliminary reliability assessment discussed in the September stakeholder meeting, no such issues were identified in the case of the Tejon area. Therefore, BAMx was surprised to learn that the CAISO is considering approval of these projects in the 2023-2024 TPP.</p> <p>The rushed approvals of the three projects mentioned above do not allow the stakeholders to independently evaluate the need and adequacy of the recommended mitigations. For example, the recommended Salinas Reinforcement Project was not even among the four (4) transmission alternatives presented by PG&E during the September 27, 2023 stakeholder meeting. Furthermore, the transmission power flow modeling is unavailable for any of the transmission alternatives and the CAISO-recommended project. Without the availability of this data, it is impossible to provide meaningful stakeholder feedback on the need for these projects.</p> <p>BAMx believes the CAISO should require PG&E to develop its conceptual proposals further and perform complete alternative evaluations to determine the best alternatives. If there is urgency in approving a reliability upgrade project(s) in the 2023-2024 TPP, BAMx could support the CAISO extending the TPP like the arrangement in the case of the Oakland Area transmission assessment expected in Q2 and Q3 of 2024. This additional time will provide the stakeholders with the necessary time to perform independent evaluations.</p> <p><u>New Approvals Eliminating the Need for Some of the Previously Approved Projects</u></p> <p>BAMx appreciates the CAISO's due diligence in recommending canceling some of the previously approved projects. Two examples are:</p>	<p>The Tejon issues were identified during further review and are included in the Appendix C of the draft Plan.</p> <p>Request window submissions posted on the MPP should have details on recommended alternatives modeling, any further information can be provided upon request.</p> <p>The CAISO has worked with PG&E in confirming the load forecast modeled and also completed assessment of alternatives leading to the recommended projects.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<ol style="list-style-type: none"> 1. With the recommended Reedley 70kV Capacity Increase Project, the previously approved Reedley 70kV Reinforcement Project will no longer be needed and can be canceled.[4] 2. The recommended Salinas Area Reinforcement Project overwrites the previously approved Salinas-Firestone #1 and #2 reconductor project [5] <p>BAMx urges the CAISO to comprehensively evaluate the need for all the previously approved projects as the new projects are recommended. For example, is the Lone Tree – Cayetano – Newark Corridor Series Compensation project approved in the 2022-2023 Transmission Plan to address the North Dublin-Vineyard 230 kV constraint needed if the CAISO is recommending the approval of the North Dublin Vineyard 230 kV Reconductoring project in the Draft Plan?</p> <p><u>Grid-enhancing Technologies (GETs) Need to be Fully Evaluated and Reported</u></p> <p>BAMx appreciates the CAISO's inclusion of a section on the Grid-enhancing technologies (GETs) in the Draft Plan.[6] As the Draft Plan recognizes, FERC Order No. 2023 requires transmission providers to consider opportunities to deploy GETs in the resource interconnection process. However, the discussion in the Draft Plan is fairly general. It does not describe specific instances where the GETs were considered potential alternatives and rejected relative to the proposed mitigation measures. After all, there is only one project in this Draft Plan, that is, the phase shifting transformer at Humboldt 115kV that qualifies as GET. We encourage the CAISO to describe why they have not used more grid-enhancing technologies in this year's plan. It should delineate when it considers GETs and where they were considered.</p>	<p>Need for previously approved projects are evaluated on a case-by-case basis based on the extent of changes in the input assumptions.</p> <p>GETs solution, like flow control devices, are not feasible for most of the issues identified due to radial nature of the issue and not having alternative path of supply. For some projects, flow control option were evaluated but not recommended as it caused reliability issue on the parallel path.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>[1] BAMx consists of City of Palo Alto Utilities and City of Santa Clara, Silicon Valley Power.</p> <p>[2] Greater Bay Area Preliminary Reliability Assessment Results, 2023-24 Transmission Planning Process Stakeholder Meeting, September 26-27, 2023, slide #7.</p> <p>[3] See 2023 Request Window Submissions, Introduction and Overview Preliminary Reliability Assessment Results, 2023-2024 Transmission Planning Process Stakeholder Meeting, November 16, 2023, Page 10.</p> <p>[4] Draft Plan, p. 57.</p> <p>[5] Draft Plan, p. 49.</p> <p>[6] Draft Plan, p.8, 24-25.</p>	
1D	California Community Choice Association	See response in Section 4.	
1E	California Public Utilities Commission - Energy Division	<p style="text-align: center;">Grid-Enhancing Technologies</p> <p>CPUC staff appreciates the additional focus that the CAISO has included in this Draft Transmission Plan on Grid-Enhancing Technologies (GETs) as alternatives to traditional upgrades. We understand that the CAISO considers GETs on a case-by-case basis, and we support these efforts to thoroughly consider less expensive ways to mitigate reliability issues whenever possible.</p> <p>However, CPUC staff notes that the Draft Transmission Plan does not offer specific reasons why CAISO staff did not identify GETs for various transmission projects recommended for approval. We believe stakeholders would benefit from deeper explanation of what the CAISO studied and why the GETs that were considered are not appropriate solutions for each specific case and/or location.</p>	GETs solution, like flow control devices, are not feasible for most of the issues identified due to radial nature of the issue and not having alternative path of supply. For some projects, flow control option were evaluated but not recommended as it caused reliability issue on the parallel path



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>In addition to more details on each potential upgrade, CPUC staff supports the development and communication of an expansive strategy on the integration of advanced grid solutions as part of the CAISO's planning process. The annual TPP could be enhanced by a holistic explanation of how the CAISO consistently and comprehensively evaluates the benefits and costs of these technologies.</p> <p style="text-align: center;">Oakland Area Reinforcement Project</p> <p>In its analysis for the Oakland Area, the CAISO concluded that the Oakland Clean Energy Initiative (OCEI) was insufficient to mitigate the overload needs of the region and additional measures would be needed. These additional measures would be presented and approved in a 2023-2024 TPP extension in Q2 or Q3 of this year. CPUC staff is concerned that the project itself was recommended for approval when no updated cost estimations have been completed and there would be a subsequent expedited timeline for review.</p> <p>Could CAISO please explain why this analysis cannot be completed during the 2023-2024 TPP cycle and why an extension is necessary compared to deferring to the 2024-2025 TPP cycle? Can the CAISO also clarify if the proposed extension schedule will have additional opportunities for stakeholder engagement?</p> <p>The 23-24 TPP draft report, on page 58, notes a key aim of the proposed project is to supply the anticipated increased load in Oakland without relying on the local ageing thermal units. CPUC staff would also encourage the CAISO to provide stronger support for either a transmission or non-transmission solution to replace the longest running RMR thermal plant in the CAISO system. Would the additional analysis the CAISO plans to conduct further solidify that conclusion?</p>	<p>The cost estimation has been prioritized and is currently being reviewed. The ISO is optimistic about proposing a transmission project for the Oakland area, which aims to address all the overload issues in the long term. In addition to the cost estimation, feasibility investigations are being conducted to gain a better understanding of potential alternatives that would pose less risk during construction, especially given the challenges posed by the dense urban area of Oakland.</p> <p>The alternatives include multiple potential 230 kV sources, which need to be evaluated for cost, feasibility and constructability. As such, the CAISO needs more time to thoroughly evaluate each alternative before coming-up with a recommended alternative.</p> <p>Comment noted.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>Tejon Area Reinforcement Project and the French Camp Reinforcement Project</p> <p>Earlier in the 2023-2024 TPP cycle, the Tejon Area and French Camp Reinforcement Projects were described as “conceptual” and now are being recommended for approval. For context, during the April 9, 2024 meeting, stakeholders mentioned how the CAISO considers a higher load forecast as a sensitivity scenario but does not approve projects triggered by such higher loads until the CEC includes them in the CEC forecasts. The CAISO responded that there were issues PG&E had identified using PG&E’s forecast in the CAISO’s baseline scenarios, which CPUC staff could not locate from what CAISO had already provided. The CAISO stated that they worked with PG&E on the locational aspects of these loads to ensure the loads forecasted were (with the actual interconnection requests from PG&E) triggering the need for projects that are currently in this draft 2023-2024 Transmission Plan.</p> <p>Are projects tagged “conceptual” distinctly different from other projects identified through the TPP analysis, or is it merely a naming convention? If they are distinctly different, do such projects go through a different review process when CAISO is determining the need for projects and recommending them for approval? Lastly, CPUC staff asks that the CAISO clarify the location of the baseline files used to determine the need for the Tejon Area and French Camp Reinforcement Projects; and if not currently available, to make them available to stakeholders.</p>	<p>During November stakeholder meeting, the 3 conceptual project submissions were not complete even though the need was identified. The CAISO worked with PG&E on confirming the load growth modeled and assessed various alternatives and recommended alternatives that is cost effective and meets long term need. In some cases, the recommended alternative was not a part of original alternative that PG&E proposed. The base cases are posted on the MPP.</p>
1F	California Public Utilities Commission - Public Advocates Office	<p>The Public Advocates Office at the California Public Utilities Commission (Cal Advocates) provides these comments on the California Independent System Operator’s (CAISO) Draft 2023-2024 Transmission Plan issued on April 1, 2024 and stakeholder meeting on the draft Plan on April 9 2024. Cal Advocates is an independent ratepayer advocate with a mandate to obtain the lowest possible rates for utility services, consistent with reliable and safe service levels and the state’s environmental goals¹¹</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
		<p><u>A. Requests for Additional Project Information</u></p> <p>i. <u>For the Gates 230/70 kilovolt (kV) Transformer Addition Project, Cal Advocates requests that CAISO and Pacific Gas and Electric Company (PG&E) provide additional information to explain the estimated project cost.</u> The reported cost for the Gates 230/70 kV Transformer Addition Project is between \$36 million and \$72 million.[2] Based on the Participating Transmission Owner (PTO) per unit guide, an additional transformer bank at 230/70 kV should cost between \$9.5 million and \$19 million, with a 1.053 Escalation Rate applied for an in-service date of 2030.[3],[4] Given the cost difference between the proposed Gates 230 kV Transformer Addition project and the PTO per unit cost guide, PG&E should provide additional information to explain this difference.</p> <p>ii. <u>CAISO and the PTOs should provide the proposed circuit, tower, and terrain types as well as the proposed line length to be reconducted for all proposed projects to confirm that the reported project costs are reasonable.</u> To explain, CAISO and PG&E did not provide sufficient information for the Reedley 70 kV Capacity Increase and Crazy Horse Canyon (CHCSS)-Salinas-Soledad #1 and #2 115 kV Line Reconductoring projects to compare their estimated costs with the cost information provided in the PTOs' Final Per Unit Cost Guide.[5],[6] CAISO and PG&E, however, did provided the length of the lines to be reconducted for the Vaca-Plainfield 60 kV, the Rio Oso-W. Sacramento and Cortina #1 60 kV Line reconductoring projects.[7] Consistent with this practice, Cal Advocates requests that the CAISO and all the PTOs provide the circuit, tower and terrain types, and line lengths to be reconducted.</p>	<p>Gates Bank cost estimates includes cost for all the scope listed below :</p> <ol style="list-style-type: none"> 1. 70kV bus conversion 2. New Bank 3. Route Exiting bank connection to bus section E <p>Some of these information, like circuit miles, are provided in the Appendix B details. The CAISO will work with PTO for feasibility of providing other information.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>iii. <u>For any proposed shunt reactors or other proposed new electrical grid equipment. Cal Advocates requests that CAISO and its PTOs provide a cost estimate.</u> Cal Advocates makes this request because CAISO and PG&E cited just “lump sum” as the cost estimate for the proposed Shunt Reactors for the Diablo Canyon Area 230 kV High Voltage Mitigation project. [8]</p> <p><u>B. CAISO Should Provide Participating Transmission Owners More Time to Develop Project Mitigation Recommendations.</u></p> <p>At the September 27, 2023 reliability meeting, PG&E presented three conceptual projects and did not include final mitigation recommendations or project costs.[9] These projects are the Tejon Area, French Camp, and Spence 60 kV Area Reinforcement (now referred to as the Salinas Reinforcement project) projects. At the September 27, 2023, a PG&E representative explained that PG&E could not provide recommendations and costs for these projects because the existing one-month timeframe given in the Transmission Planning Process (TPP) to develop project solutions is not sufficient.[10] PG&E also continues to provide project cost estimates with a contingency of 100%.[11] A 100% contingency reflects a highly uncertain design. Cal Advocates requests that CAISO consider allowing at least six weeks for PTOs to develop project concepts in the TPP. Providing this additional time should allow the PTOs to provide complete project analysis and more accurate cost estimates for stakeholder review before projects are presented for approval.</p> <p><u>C. Cal Advocates Requests Greater Transparency in the Transmission Planning Process</u></p> <p>i. All PTOs should provide their power flow results and alternative analysis for all proposed projects to</p>	<p>Comment noted.</p> <p>Comment noted. The CAISO recently extended the TPP planning cycle to provide more time for these coordination needed in developing solutions.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>demonstrate the project need and their determination of the least-cost best-fit option.</p> <p>PG&E did not provide its power flow results or alternative analysis for the Rio Oso W. Sacramento and Cortina #1 60 kV line reconductoring projects at CAISO's September 27, 2023 reliability meeting or its April 9, 2024 Draft Transmission Plan meeting. When CAISO and the PTOs present projects for approval without any information on the alternatives considered or power flow results, stakeholders are not provided the opportunity to understand the reason for potential mitigation solutions or to assess the benefits of alternatives. Cal Advocates requests that CAISO and its PTOs consistently provide their power flow and alternative analyses for all projects proposed for approval to provide transparency in the TPP.</p> <p>ii. All PTOs should present their project alternatives in stakeholder meetings and include their analyses of grid enhancing technologies.</p> <p>Cal Advocates appreciates CAISO's consideration of the opportunities presented by grid enhancing technologies (GETs) in its Draft 2023-2024 Transmission Plan. As demonstrated through more than half a decade of research and case studies, GETs can enhance the capacity of existing lines and mitigate congestion at lower costs than traditional wire investment projects. <u>[12]</u>, <u>[13]</u> For this reason, Cal Advocates recommends that CAISO and its PTOs demonstrate that they consider GETs options where applicable to address identified issues on the grid in their alternative analyses. If a GETs solution cannot be considered to address grid issues for a technical reason, Cal Advocates requests CAISO and PTOs provide the reason why GETs cannot be considered in their alternative analyses.</p> <p>Since PG&E did not provide an alternative analysis for the Rio Oso W. Sacramento and Cortina #1 60 kV Line Reconductoring projects, Cal Advocates requests PG&E consider and analyze installing one to two four-hour batteries paired with a power flow</p>	<p>More details regarding need and alternatives considered are provided in Appendix B.</p> <p>The battery solution for these projects were not recommended due to charging capacity issue, for which, the flow control devices also doesn't help.</p>

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>device as an alternative to address the identified issues in these project areas.</p> <p>iii. All PTOs should present their load data in a timely manner for consideration in the California Energy Commission's annual load forecast.</p> <p>It is critical that all PTOs share their load data with the CEC in a timely manner so that it can be assessed in the CEC's Integrated Energy Policy Report (IEPR) proceeding. The IEPR proceeding is an existing process that is transparent and robust and should continue to be utilized to evaluate expected load growth including new load from the state's transportation corridors. CAISO and the California Public Utilities Commission (CPUC) both use the IEPR load forecast to develop their respective annual transmission plan and resource portfolios. It is concerning that PG&E presented three projects for approval^[14] based on expected load increases in PG&E's service area that are not consistent with California Energy Commission (CEC) most recent load forecasts and CAISO findings.^{[15],[16]}</p> <p>D. PTOs should conduct Grid Enhancing Technology pilots to Determine Best Practices for Implementing These Cost-Saving Devices.</p> <p>i. Advanced Conductors Pilots</p> <p>Cal Advocates requests that PG&E and San Diego Gas & Electric Company (SDG&E) consider advanced conductor pilots to assist with determining the best practice for implementing this cost saving technology in their service area. Advanced Conductors have a power carrying capacity that is approximately twice as much as traditional aluminum conductor steel-reinforced cable (ACSR) conductors.^[17] CAISO Vice President Neil Millar explained in the February 15, 2024 Power Association of Northern California's (PANC) monthly meeting that he believed that there would be more advanced conductor solutions</p>	<p>Bus level allocation of demand forecast is done by PTO and it is the CAISO's understanding that the load modeled in cases are not beyond CEC forecast, but more locational granularity is utilized based on the information from the Distribution Planning regarding the actual load interconnection requests.</p> <p>It is the CAISO's understanding that the PTOs are evaluating the feasibility of use of the advanced conductor and will be utilized as appropriate.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>presented in future Transmission Plans.^[18] However, the CAISO's draft 2023-2024 Transmission Plan does not recommend any projects with advanced conductors. The 2023-2024 plan recommends 26 projects for approval, amongst these, ten projects involve partial or full reconductoring of transmission lines. As reported in the CAISO's April 9, 2024 stakeholder meeting, all ten of the proposed reconductoring projects will use traditional ACSR conductors. Meaning that none of the proposed projects will involve reconductoring with advanced conductors which is the most optimal way to cost-effectively increase transmission line capacity.^[19]</p> <p>So far, the only reconductoring project CAISO has approved with advanced conductors is the Southern California Edison Company (SCE) Lugo-Victor 230 kV Reconductoring project.^{[20], [21]} SCE also uses advanced conductors to address clearance issues in its capital maintenance program according to Neil Millar.^[22] Thus, SCE seems to have adopted advanced conductors as a tool to address line issues, but the other PTOs have not.</p> <p>ii. Power Flow Device Pilots</p> <p>Cal Advocates also recommends that there be further investigation on the use of GETs to address immediate grid issues and to allow time for adequate study of mitigations and for mitigations to come online. Cal Advocates makes this request for two reasons. First, most of PG&E's proposed projects in the 2023-2024 Draft Transmission Plan are needed by 2025 to address grid issues based on PG&E's presented load need data.^[23] Second, GETs generally take one to three years to deploy,^[24] whereas on average, PG&E takes, five years or more to complete approved projects.^[25] Since it is not likely that PG&E's proposed projects will be implemented within the next two years,^[26] interim solutions such as the installation of energy storage or other GETs should be considered and or</p>	<p>GETs solution, like flow control devices, are not feasible for most of these issues identified due to radial nature of the issue and not having alternative path of supply. For some projects, flow control option were evaluated but not recommended as it caused reliability issue on the parallel path.</p>

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>piloted to address reliability issues effectively and in a timely fashion.</p> <p>Power flow device technologies also continue to advance and are already an established lower-cost option to reconductoring. A 2016 PG&E power flow devices pilot determined that the costs of power flow devices could be 33% lower than reconductoring a section of a 230 kV line even when considering both construction and on-going operation and maintenance. [27] This pilot estimated that a proposed reconductoring solution would be \$130 million whereas the power flow device technology solution would be \$33 million.[28] Further, the Department of Energy finds that the power flow control devices have the potential to be more cost-effective solutions than traditional transmission buildout, saving millions of dollars in the short-term through project deferrals.[29]</p> <p><u>E. PG&E Should Consider a French Camp Reinforcement Project Alternative</u></p> <p>Consistent with prior comments,[30] Cal Advocates requests PG&E and CAISO consider a hybrid alternative for the French Camp reinforcement project with a 15-megawatt (MW) energy storage unit and reconductoring Weber-French Camp #2 60 kV line with advanced conductors. This alternative may be just as effective as the proposed option but would have a lower cost</p>	<p>Due to the increase in load growth, the overloads in this line has significantly increased. Presently, there's no capacity for charging. Reconductoring Weber-French Camp #2 60 kV and 15 MW BESS won't be sufficient in the mid to long term. Furthermore, with continued load growth, it would also lead to overloading the Weber bank under N-1 contingency. Therefore, this alternative is not viable.</p>
1G	California Wind Energy Association	No comment	
1H	Catherine Buchanan	No comment	
1I	CEERT and LEAP	<p>CEERT and Leap are pleased to see that the CAISO has recommended moving forward on multiple reliability projects that will serve disadvantaged communities in areas of the state where the electric grid is weak, like the San Joaquin Valley and the Salinas Valley. Given the growing impacts of climate change on many communities and the need for economic development in these areas it is important that local electric networks be</p>	<p>Your comment is noted</p>

No	Submitting Organization	Comment Submitted	CAISO Response																					
		<p>reinforced so that they have more capacity and are more reliable and resilient.</p> <p>The table below lists the reliability-driven projects located in underserved areas that CEERT believes should be given priority for near-term implementation.</p> <p style="text-align: center;">Reliability Projects in Disadvantaged Areas of California</p> <table><tr><th>Project Name</th><th>Transmission Planning Area</th><th>Estimated Cost (\$M)</th></tr><tr><td>Camden 70 kV Reinforcement</td><td>Greater Fresno</td><td>\$100</td></tr><tr><td>Gates 230/70 kV Transformer Addition</td><td>Greater Fresno</td><td>\$72</td></tr><tr><td>Reedley 70 kV Capacity Increase</td><td>Greater Fresno</td><td>\$98</td></tr><tr><td>Salinas – Soledad #1 & #2 115 kV line reconductoring</td><td>Central Coast (Salinas)</td><td>\$108</td></tr><tr><td>Salinas Area Reinforcement</td><td>Central Coast (Salinas)</td><td>\$452.3</td></tr><tr><td>French Camp Reinforcement</td><td>Central Valley (Stockton)</td><td>\$84.2</td></tr></table> <p>In the future CEERT and LEAP would like to see PG&E, the participating transmission owner for these projects, reach out early to impacted communities to better communicate the need for and the benefits provided by these proposed projects and also consider non-wires alternatives that can be added to make the communities more electrically resilient.</p>	Project Name	Transmission Planning Area	Estimated Cost (\$M)	Camden 70 kV Reinforcement	Greater Fresno	\$100	Gates 230/70 kV Transformer Addition	Greater Fresno	\$72	Reedley 70 kV Capacity Increase	Greater Fresno	\$98	Salinas – Soledad #1 & #2 115 kV line reconductoring	Central Coast (Salinas)	\$108	Salinas Area Reinforcement	Central Coast (Salinas)	\$452.3	French Camp Reinforcement	Central Valley (Stockton)	\$84.2	
Project Name	Transmission Planning Area	Estimated Cost (\$M)																						
Camden 70 kV Reinforcement	Greater Fresno	\$100																						
Gates 230/70 kV Transformer Addition	Greater Fresno	\$72																						
Reedley 70 kV Capacity Increase	Greater Fresno	\$98																						
Salinas – Soledad #1 & #2 115 kV line reconductoring	Central Coast (Salinas)	\$108																						
Salinas Area Reinforcement	Central Coast (Salinas)	\$452.3																						
French Camp Reinforcement	Central Valley (Stockton)	\$84.2																						
1J	County of Humboldt	No comment																						
1K	Equinor US LLC	No comment																						
1L	Fervo Energy Company	<p>Fervo Energy Company (“Fervo”) appreciates the opportunity to provide comments on the California ISO’s (“CAISO”) 2023-24 Draft Transmission Plan and supports the recommended approval of improvements to the El Dorado transmission project transporting energy from the Southwest United States into California. This transmission infrastructure is critical to accommodate Geothermal Energy resources in the Southwest which is already providing reliable clean-firm power to support the California grid and clean energy targets.</p> <p>Upgrades to El Dorado transmission as well as other lines that</p>	<p>Your comment is noted. The CAISO will continue to monitor the Eldorado area transmission deliverability constraint in the 2024-2025 TPP cycle and propose transmission upgrade if needed.</p> <p>Regarding the Eldorado 230kV SCD mitigation, it eliminates the identified short-circuit duty issue at Eldorado 230kV bus allowing more generation projects interconnect from a SCD perspective, but its impact on the TPD in this zone is minimal.</p>																					



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>import resources from the southwest will be imperative to meeting reliability needs in California. Fervo is a developer of utility-scale enhanced geothermal systems (EGS) projects that actively serve California. Fervo is on track to deliver the 400-megawatt Cape Station Project to California Load Serving Entities (LSEs) fully by 2028 to meet the procurements ordered in D. 21-06-035. Despite dedicated efforts by the CAISO, deliverability will prove to be the largest obstacle in delivering clean firm power to California customers. Upgrades and transmission build out such as El Dorado will be imperative to deliver power already being produced in the Southwest.</p> <p>The El Dorado upgrade timeline could significantly impact the ability of interconnection customers to achieve their proposed commercial operation dates. Therefore, Fervo requests that the CAISO provide a clean timeline for the El Dorado upgrade implementation, aligned with the projected commercial operation dates of interconnection requests in the area. Clarification on potential delay risks for interconnection customers as well as CAISO's considered mitigation measures or interim solutions would also be appreciated in order to facilitate careful planning. Fervo intends to participate in CAISO's upcoming Transmission Development Forums and the CPUC's Transmission Project Review process to stay informed on the progress at Eldorado and urges CAISO to ensure that detailed and up to date information is available to stakeholders through these processes.</p> <p>Fervo notes that the Eldorado 230 kV short circuit duty mitigation project has the potential to affect the availability of transmission capacity in the area and, thus, it may impact how many projects are allowed to enter the interconnection queue in this "zone" under the proposed reforms in the Interconnection Process Enhancements (IPE) 2023. Fervo would appreciate clarification on how and if the proposed upgrade will create additional Transmission Plan Deliverability (TPD) capacity in this zone. Fervo appreciates CAISO's efforts to inform stakeholders about Zonal Designations through the "Interconnection Area Constraint</p>	

No	Submitting Organization	Comment Submitted	CAISO Response
		Zones” and Constraint Mapping with Transmission Plan Deliverability Allocated” reports, but requests more clarity about when and how the impacts of the Eldorado upgrade will be reflected in those reports.	
1M	Golden State Clean Energy	No comment	
1N	LS Power	No comment	
1O	LSA	No comment	
1P	Northern California Power Agency	<p>In its draft plan, the CAISO is considering approval of three reliability projects:</p> <ul style="list-style-type: none"> • Salinas Area Reinforcement Project (\$452.3M) • Tejon Area Reinforcement Project (\$56M) • French Camp Reinforcement Project (\$84.2M) <p>NCPA would like to understand what changed between the November 2023 Reliability Assessment and Study Update, in which CAISO indicated these projects are conceptual and “do not meet a reliability need identified by the CAISO in this TPP Cycle”^[1] and the April 2024 posting of the Draft Transmission Plan in which CAISO recommends the projects for approval.^[2] NCPA would specifically like to understand what validation was done for approval and whether the projects are consistent with the demand forecast approved by the CEC.</p> <p>Another item of concern is the cost allocation for the three projects since the CAISO indicated all three projects are needed due to distribution load growth. NCPA would like to ensure that all costs are being appropriately allocated between transmission and distribution ratepayers.</p>	<p>During November stakeholder meeting, the 3 conceptual project submissions were not complete even though the need was identified. ISO and PG&E worked on confirming the load growth modeled and subsequently recommended alternatives that helps meet the reliability needs for long term.</p> <p>Comment noted.</p>
1Q	Offshore Wind California	No comment	
1R	Redwood Region Partners	While the recommended Humboldt transmission projects are primarily framed in the Draft Report as policy-driven, they offer critical paths to greater reliability in the Redwood Region. For additional information, please see our full set of comments under the ‘policy-driven projects’ section of this submission form.	Comment noted.
1S	RWE Renewables	No comment	
1T	San Diego Gas & Electric	SDG&E conducted its annual short circuit analysis as part of the 2023-2024 TPP study plan. The short circuit results show that in	The ISO will review the alternatives proposed by SDG&E to mitigate the SCD concerns at Imperial Valley and Miguel 230 kV substations



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>the 2035 case the short circuit current exceeds the circuit breaker's interrupting capacity at the Imperial Valley and Miguel 230 kV buses. This poses a significant risk to grid reliability and safety.</p> <p>The Imperial Valley's 230 kV substation circuit breakers have also been identified as overstressed and assigned to interconnection customers since cluster 12. To give more clarity to the interconnection studies, SDG&E has also been performing a year-by-year short circuit analysis (Operational Reliability Studies, ORS) to forecast the year when there will be a sufficient level of generation prompting the upgrade. The latest ORS results show the interconnection projects with in-service dates of 2027 and beyond will need the current 63kA rating of breakers to be upgraded before they will be able to connect to the grid. There is currently a significant number of projects that are in queue to reach ISD by 2027. Following the TPP approval, SDG&E will be able to update its Interconnection Customers of the newly approved and revised mitigation in its 2024 Reassessment Report.</p> <p>The implementation of the current limiting reactors in series with the 230 kV bus at Imperial Valley substation is estimated to take 9 years including 3 years for completing minimum permitting requirements and 6 years for ordering equipment, design and construction of the project.</p> <p>Increased lead times for equipment procurement have become a pressing issue. Over the past four years, these lead times have increased to four years for circuit breakers and two years for the air-core reactors needed for this application. We expect lead times to increase further in the short term. A delay of this magnitude can hamper our ability to address these deficiencies effectively if postponed any longer.</p> <p>The challenges we have encountered with simply upgrading the circuit breakers to an 80-kA rating have forced us to investigate other creative solutions to reduce fault current such as installing</p>	<p>and will consider them as projects under review for potential approval as an extension of the 2023-2024 Transmission Plan.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>current limiting reactors in series with the bus. This solution has not only been studied and tested from transmission planning perspective but also vetted by the engineering design teams for Imperial Valley.</p> <p>The Bus Series Reactor alternative for the Imperial Valley substation has been determined to be the most effective solution, from a transmission planning, engineering, and operations perspective, in mitigating the overstressed circuit breakers than the alternative to split the bus. SDG&E recommends that CAISO selects the Bus Series Reactor alternative.</p> <p>Mitigating the overstressed breakers at Miguel's 230 kV bus has come with unique challenges such as limited land to expand the substation. Although SDG&E is exploring the implementation of current limiting reactors in series with the bus; SDG&E believes that adding a 3-Ohm Current Limiting Reactor to TL23026 and opening one of the "X" breakers at Miguel (TL23041C or TL23042C) will be the most cost-effective alternative.</p> <p>The options listed below are the recommended alternative to mitigate the Miguel 230 kV overstressed breakers. These options will be submitted for review to the ISO by the end of May 2024:</p> <ul style="list-style-type: none"> • Adding a 3-Ohm Current Limiting Reactor to TL23026 and opening one of the "X" breakers (TL23041C or TL23042C). • Reconducting Sycamore–Scripps 69 kV (TL6916) and opening one of the "X" breakers (TL23041C or TL23042C). • Install current limiting reactors in series with the 230 kV buses 	
1U	San Francisco Public Utilities Commission	The City and County of San Francisco, through its Public Utilities Commission (SFPUC), appreciates the opportunity to comment	



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>on the Draft 2023-2024 Transmission Plan (Draft Plan, hereafter), dated April 1, 2024.</p> <p>The Egbert Switching Station Should Be Completed As Soon As Possible and Not Be Delayed Until 2028</p> <p>SFPUC requests the CAISO's assistance to ensure that Pacific Gas & Electric Company (PG&E) promptly completes the Martin 230 kV Bus Extension Project, aka Egbert Switching Station Project (Project or Egbert Project, hereafter), without further delay. The CAISO found the Project necessary to mitigate San Francisco's vulnerability to devastating events almost a decade ago, in the 2014-2015 Transmission Plan. The Project had an original in-service date of 2021. CAISO's 2022-2023 Transmission Plan extended the in-service date to 2023. CAISO's new Draft 2023-2024 Transmission Plan pushes this date out an additional five (5) years, to 2028 (Table 8.1-2). There are no valid reasons to further delay the Egbert project, as it is still needed to mitigate the risks of an outage with devastating short-term and long-term consequences for public health, welfare, and business in the City and the State.</p> <p>We understand that PG&E started construction of the Egbert Project in 2022 and has acquired the necessary equipment. However, PG&E has designated the Egbert Project a low priority and unilaterally placed the Project on hold.</p> <p>The Egbert Project is needed to meet NERC reliability and CAISO planning requirements, in addition to mitigating critical infrastructure vulnerability. The Draft Plan does not include any CAISO re-evaluation or justification for further delay in completing this critical Project; therefore, the presumption is that the CAISO's earlier assessment regarding the critical need for the Project remains unchanged. Accordingly, the SFPUC urges the CAISO to require PG&E to resume construction and complete the Egbert Switching Station as soon as possible. The SFPUC requests that the CAISO include an expedited schedule</p>	<p>Comment noted.</p>

No	Submitting Organization	Comment Submitted	CAISO Response																								
		for the completion of the Egbert Project with a 2025 in-service date in the Final 2023-2024 Transmission Plan.																									
1V	Silicon Valley Power	<p>The City of Santa Clara, dba Silicon Valley Power (SVP), appreciates the opportunity to comment on the draft 2023-24 Transmission Plan ("Draft Plan" hereafter). SVP appreciates the CAISO staff's tremendous efforts throughout the 2023-2024 transmission planning cycle and continued work to identify and address the issues in the Santa Clara area. In these comments, SVP urges to address several reliability issues in the near-term and long-term planning horizon to meet NERC planning criteria. SVP is currently restricting the interconnection of existing and new data centers in its service territory to assure reliability until transmission improvements are in place to accommodate the near-term and long-term reliability issues.</p> <p>Short-term operational plan required to address multiple NERC and CAISO Planning Criteria Violations</p> <p>CAISO has identified several P1 and P6 contingencies-driven overloads in Study Year 2025 on NRS 230/115 kV transformers, Los Esteros to SSS 230 kV line, Nortech to NRS 115 kV line, and Newark to NRS 115 kV line as shown in the Table 1 below. Also, the loading on one of the NRS-SRS 115 kV lines for the loss of the remaining line is close to 100% in 2025.</p> <p><i>Table 1 - Study Year 2025</i></p> <table border="1"> <thead> <tr> <th>Overloaded Facility</th><th>Most Limiting Contingency</th><th>Category</th><th>Loading % 2025 Summer</th></tr> </thead> <tbody> <tr> <td>NRS 230/115 kV TB1</td><td>Los Esteros to Nortech 115 kV</td><td>P1</td><td>106%</td></tr> <tr> <td>Los Esteros to SSS 230 kV line (PST)</td><td>Los Esteros to Nortech 115 kV</td><td>P1</td><td>109%</td></tr> <tr> <td>NRS to SRS 115 kV line #1 (or #2)</td><td>NRS to SRS 115 kV line #2 (or #1)</td><td>P1</td><td>99%</td></tr> <tr> <td>Newark to NRS #1 115 kV line</td><td>Los Esteros to Nortech 115 kV and NRS T2</td><td>P6</td><td>106%</td></tr> <tr> <td>Newark to NRS #2 115 kV line</td><td>Los Esteros to Nortech 115 kV and NRS T2</td><td>P6</td><td>108%</td></tr> </tbody> </table> <p>Several projects, such as the Santa Clara series compensation project on Los Esteros to Nortech 115 kV line, NRS rebuild project, Newark to NRS 230 kV HVDC line, Space Park Junction</p>	Overloaded Facility	Most Limiting Contingency	Category	Loading % 2025 Summer	NRS 230/115 kV TB1	Los Esteros to Nortech 115 kV	P1	106%	Los Esteros to SSS 230 kV line (PST)	Los Esteros to Nortech 115 kV	P1	109%	NRS to SRS 115 kV line #1 (or #2)	NRS to SRS 115 kV line #2 (or #1)	P1	99%	Newark to NRS #1 115 kV line	Los Esteros to Nortech 115 kV and NRS T2	P6	106%	Newark to NRS #2 115 kV line	Los Esteros to Nortech 115 kV and NRS T2	P6	108%	
Overloaded Facility	Most Limiting Contingency	Category	Loading % 2025 Summer																								
NRS 230/115 kV TB1	Los Esteros to Nortech 115 kV	P1	106%																								
Los Esteros to SSS 230 kV line (PST)	Los Esteros to Nortech 115 kV	P1	109%																								
NRS to SRS 115 kV line #1 (or #2)	NRS to SRS 115 kV line #2 (or #1)	P1	99%																								
Newark to NRS #1 115 kV line	Los Esteros to Nortech 115 kV and NRS T2	P6	106%																								
Newark to NRS #2 115 kV line	Los Esteros to Nortech 115 kV and NRS T2	P6	108%																								

No	Submitting Organization	Comment Submitted	CAISO Response												
		<p>(SPJ) Battery Energy Storage System (BESS) Q1918, and NRS to KRS 115 kV line have been proposed to address these issues in the long-term. However, these projects are planned to be in-service in 2026 and later years. So, SVP would recommend that CAISO develop an interim plan to avoid these overloads until these planned projects are in-service. These interim solutions are important to manage the significant load growth SVP is expected to see due to the addition of eight new data centers in the next two years.</p> <p>Overload on NRS to Scott 115 kV line</p> <p>CAISO has identified the P6 contingencies driven overload on NRS to Scott 115 kV line in 2028, as shown in Table 2 below, and the potential mitigation column says, “Mitigation under Development”.</p> <p><i>Table 2 - Study Year 2028</i></p> <table><tr><th rowspan="2">Overloaded Facility</th><th rowspan="2">Most Limiting Contingency</th><th rowspan="2">Category</th><th colspan="2">Loading %</th></tr><tr><th>2028 Summer</th><th>2035 Summer</th></tr><tr><td>NRS to SRS 115 kV line #1 (or #2)</td><td>NRS to SRS 115 kV line #2 (or #1) and NRS to KRS 115 kV line</td><td>P6</td><td>106%</td><td>141%</td></tr></table> <p>SVP would suggest that CAISO add a detailed operational mitigation plan required to resolve these issues in 2028. In 2035, the % loading in the line is significantly higher.</p> <p>Coordination between PST, HVDC lines and Santa Clara series compensation settings</p> <p>SVP appreciates the additional evaluation CAISO performed to resolve the PST overload shown in Table 3 for the loss of the HVDC line (as shown in the table below) by adjusting the settings of PST, Santa Clara series compensation, installation of a 50MW SPJ BESS internally within the SVP system, and San Jose area HVDC lines for Study Year 2028 (SVP peak load= 1,003 MW) and 2035 (SVP peak load= 1,296 MW). However, the results show “Mitigation under development” as a proposed</p>	Overloaded Facility	Most Limiting Contingency	Category	Loading %		2028 Summer	2035 Summer	NRS to SRS 115 kV line #1 (or #2)	NRS to SRS 115 kV line #2 (or #1) and NRS to KRS 115 kV line	P6	106%	141%	<p>The mitigation for the overload in the 2028 scenario relies on Operational solutions that can be implemented to reduce the power flow coming from Newark and Los Esteros substations. One alternative to mitigate the overload is to redispatch the HVDC transmission lines to adjust the flow on the Newark-NRS HVDC to ~250 MW and ~450 MW on the Metcalf-San Jose HVDC and change the smart valve reactor on Los Esteros-Nortech to step 3 (half capacity). The long-term overload will be monitored in the next planning cycle.</p> <p>The mentioned tables will be updated in the final version of the TPP by adding the mitigation found to solve the overload under P6 contingencies in the corresponding records; in this case, it was an Operational solution. For long-term overloads, further analysis is required in order to propose potential mitigations, which is why those issues will continue to be monitored.</p>
Overloaded Facility	Most Limiting Contingency	Category				Loading %									
			2028 Summer	2035 Summer											
NRS to SRS 115 kV line #1 (or #2)	NRS to SRS 115 kV line #2 (or #1) and NRS to KRS 115 kV line	P6	106%	141%											



No	Submitting Organization	Comment Submitted	CAISO Response																																								
		<p>mitigation solution. So, SVP would recommend that CAISO update the mitigation solution for PST overload based on the additional analysis CAISO performed as shown in Table 4.</p> <p><i>Table 3 - 2028, 2035 "Mitigation Under Development"</i></p> <table border="1"> <thead> <tr> <th rowspan="2">Overloaded Facility</th><th rowspan="2">Most Limiting Contingency</th><th rowspan="2">Category</th><th colspan="2">Loading %</th></tr> <tr> <th>2028 Summer</th><th>2035 Summer</th></tr> </thead> <tbody> <tr> <td>Los Esteros to SSS 230 kV line (PST)</td><td>NRS to Newark 230 kV HVDC line</td><td>P1</td><td>112%</td><td>116%</td></tr> </tbody> </table> <p>Below are the recommended pre-contingency settings that worked for TPP 23/24 model.</p> <p>Study Year 2028: PST =290 MW (angle -6.23, tap= 10), Nortech settings at S3 (X=0.0152), Newark to NRS HVDC line at 350 MW, San Jose B to Metcalf HVDC line at 450 MW, SPJ BESS at 50MW and SVP internal generation dispatch same as found in the model.</p> <p>Study Year 2035: PST =290 MW (angle -3.42, tap =6), Nortech settings at S5 (X=0.02180), Newark to NRS HVDC line at 350 MW, San Jose B to Metcalf HVDC line at 400 MW, SPJ BESS at 50 MW and SVP internal generation dispatch same as found in the model.</p> <p>Table 4 below shows the % loading on the most limiting facilities with the adjusted pre-contingency settings.</p> <p><i>Table 4 - Pre_Contingency Settings Mitigation 2028, 2035</i></p> <table border="1"> <thead> <tr> <th rowspan="2">Overloaded Facility</th><th rowspan="2">Most Limiting Contingency</th><th rowspan="2">Category</th><th colspan="2">Loading %</th></tr> <tr> <th>2028 Summer</th><th>2035 Summer</th></tr> </thead> <tbody> <tr> <td>Los Esteros to SSS 230 kV line (PST)</td><td>NRS to Newark 230 kV HVDC line</td><td>P1</td><td>98.1</td><td>99.9</td></tr> <tr> <td>FMC to KRS 115 kV line</td><td>Los Esteros to SSS 230 kV line (PST)</td><td>P1</td><td>80.2</td><td>97.0</td></tr> <tr> <td>FMC to KRS 115 kV line</td><td>NRS to Newark 230 kV HVDC line</td><td>P1</td><td>75.3</td><td>98.1</td></tr> <tr> <td>Los Esteros to Nortech 115 kV line</td><td>Los Esteros to SSS 230 kV line (PST)</td><td>P1</td><td>72.1</td><td>98.0</td></tr> </tbody> </table> <p>SVP is interested in working with PG&E, SmartWires, and CAISO to determine the detailed sequence of operations.</p>	Overloaded Facility	Most Limiting Contingency	Category	Loading %		2028 Summer	2035 Summer	Los Esteros to SSS 230 kV line (PST)	NRS to Newark 230 kV HVDC line	P1	112%	116%	Overloaded Facility	Most Limiting Contingency	Category	Loading %		2028 Summer	2035 Summer	Los Esteros to SSS 230 kV line (PST)	NRS to Newark 230 kV HVDC line	P1	98.1	99.9	FMC to KRS 115 kV line	Los Esteros to SSS 230 kV line (PST)	P1	80.2	97.0	FMC to KRS 115 kV line	NRS to Newark 230 kV HVDC line	P1	75.3	98.1	Los Esteros to Nortech 115 kV line	Los Esteros to SSS 230 kV line (PST)	P1	72.1	98.0		
Overloaded Facility	Most Limiting Contingency	Category				Loading %																																					
			2028 Summer	2035 Summer																																							
Los Esteros to SSS 230 kV line (PST)	NRS to Newark 230 kV HVDC line	P1	112%	116%																																							
Overloaded Facility	Most Limiting Contingency	Category	Loading %																																								
			2028 Summer	2035 Summer																																							
Los Esteros to SSS 230 kV line (PST)	NRS to Newark 230 kV HVDC line	P1	98.1	99.9																																							
FMC to KRS 115 kV line	Los Esteros to SSS 230 kV line (PST)	P1	80.2	97.0																																							
FMC to KRS 115 kV line	NRS to Newark 230 kV HVDC line	P1	75.3	98.1																																							
Los Esteros to Nortech 115 kV line	Los Esteros to SSS 230 kV line (PST)	P1	72.1	98.0																																							



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>Projects to serve Santa Clara load growth beyond 5-year period “Long Term Horizon”.</p> <p>SVP understands the uncertainty associated with the long-term planning horizon model (Year 12) and CAISO’s approach to continue monitoring the overloads identified based on the long-term planning horizon. However, it is important to note that several new data center customers are waiting for approval to connect to the SVP system contingent upon the completion of the CAISO Newark to NRS 230 kV HVDC project, and other projects yet to be identified in the Long-Term Planning Horizon. SVP may not have control over how the data center loads ramp up once they are in service and would like to ensure it can meet the load growth of existing data centers while also meeting the requirements of new data centers awaiting approval for interconnection. So, SVP would like to emphasize the fact that SVP is relying on the timely approval and implementation of these transmission projects to accommodate the load growth reflected in the adopted CEC load forecast. Approval of these transmission projects based on this long-term horizon growth is critical for SVP in meeting its reliability needs.</p> <p>In summary, the SVP strongly supports the CAISO’s effort to resolve several issues in the SVP/San Jose area in the current planning cycle but recommends the CAISO develop additional mitigations until the long-term solution is built. Again, SVP appreciates the opportunity to comment on the Draft Plan and acknowledges the significant efforts of the CAISO staff to develop proposed mitigations to address CAISO planning criteria violations, which should reduce the probability of load curtailment by SVP.</p>	<p>Comment noted. The CAISO proposes to perform a high South Bay load sensitivity study in the 2024-2025 TPP to understand future need beyond the load forecast currently included in the CEC forecast.</p>
1W	Smart Wires Inc.	No comment	
1X	Sonoma Clean Power Authority	No comment	
1Y	Southern California Edison	No comment	
1Z	Tejon Ranch Company	No comment	
1AA	Transmission Agency of Northern California	No comment	



No	Submitting Organization	Comment Submitted	CAISO Response
1BB	Vineyard Offshore, LLC	No comment	
1CC	Pacific Gas & Electric	<p>PG&E greatly appreciates the work that CAISO has done to prepare the 2023-24 Draft Transmission Plan and the opportunity to provide these comments. PG&E provides the below comments on specific projects.</p> <p><u>Tejon Area Reinforcement Project</u></p> <p>PG&E strongly supports and appreciates CAISO's recommended approval of the Tejon Area Reinforcement Project. PG&E's distribution planning load forecasts indicate a significant increase in demand at the Tejon and San Bernard substations by 2025. The project is crucial for meeting the immediate demand increase in the area. PG&E's evaluation suggests that reinforcing the 70 kV network in this pocket is a "no-regret" planning approach that will accommodate the forecasted near-term increase in demand in a cost-effective manner while also aligning with broader capacity expansion plans for this area. The project will not only support the ongoing electrification efforts but also promote industrial and commercial growth in the Tejon area. PG&E believes similar projects that reinforce the system will be needed in future in areas along the Interstate 5 and Interstate 99 corridors for continued support of transportation electrification.</p> <p>PG&E is committed to ongoing collaboration with CAISO to further evaluate the potential need for additional transmission capacity expansion in the Tejon area. The effort will address the expected long-term load growth driven by electrification and projected freight load increase. In addition, the effort could look at facilitating the integration of renewable resources into the electric system, enhancing the sustainability and resilience of the energy supply in the Tejon area.</p> <p>PG&E requests an update to the in-service date of the project, which currently lists 2027 on page 56 and page H-21 of Appendix H in the CAISO Draft Transmission Plan. The expected in-service</p>	Comment noted.



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>date of this project as presented in the latest stakeholder meeting, would be year 2029 or earlier.</p> <p><u>Salinas Area Reinforcement Project</u> PG&E extends its strong support and appreciation for CAISO's recommendation of the Salinas Area Reinforcement Project. The project is critical for supporting the electrification and growth of industrial and agricultural demand in the Salinas, Spence, and Gonzales areas. By enhancing the existing infrastructure, this project aims to meet not just the immediate needs but also the projected long-term growth in this region</p> <p><u>French Camp Reinforcement Project</u> PG&E also strongly supports and appreciates CAISO's recommended approval of the French Camp Reinforcement Project. Similar to the Tejon and Salinas area projects, this project is crucial for accommodating the expected significant and rapid load growth in the South Stockton area, especially given its proximity to two of California's main vehicle transportation corridors. The recommended scope not only addresses the near-term overload issues but does so in a cost-effective manner by maximizing the use of available capacity on the existing 230 kV transmission system. The reinforcement project is essential for supporting ongoing and future electrification, industrial and business developments in the area.</p> <p><u>Oakland Area Reinforcement Project</u> PG&E supports the CAISO's evaluation of need for an Oakland Area Reinforcement Project. We recognize the critical need for this project as it addresses the significant demand increase and existing reliability concerns in the densely populated Oakland area. The project is essential for not only for meeting anticipated demand but also to facilitate the eventual retirement of the thermal units in Oakland, supporting California's environmental goals. PG&E looks forward to collaborating with CAISO to ensure that the chosen alternative is scalable and capable of adapting to future growth, ensuring long-term reliability and capacity.</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
		Regarding the previously approved Oakland Clean Energy Initiative (OCEI) project, PG&E supports the continuation and implementation of all planned transmission and substation upgrades under this project. While OCEI alone may not fully address the expected long-term NERC reliability standards violations, its role in reducing dependency on local thermal generation units is crucial. PG&E also supports the integration of energy storage solutions in the Oakland area. However, given the current uncertainties surrounding the full materialization of the energy storage and limitations in charging capabilities due to existing transmission constraints, PG&E recognizes ensuring continued system reliability may require relying on the Oakland C units for the interim period. The energy storage project could serve as a complementary interim solution, offering additional operational benefits while the necessary upgrades and expansions are underway, however there is uncertainty if the energy storage will come to fruition.	
1DD	Natural Resources Defense Council, Inc.	<p>The Natural Resources Defense Council (NRDC) submits these comments generally on the Draft 2023-2024 Transmission Plan.</p> <p>We support the comments submitted by Redwood Region Partners, including the Blue Lake Rancheria, Environmental Protection and Information Center, and the Redwood Region Climate and Community Resilience Hub, who raise four critically important issues to address: (1) Establish a diverse committee of impacted parties to ensure equitable scoring criteria are used for the Phase 3 solicitation process in addition to existing financial and technical qualification criteria. (2) Enhance the TPP process to include specific participation from Tribal Nations and local communities to assess potential local benefits and impacts. (3) Make Tribal Sovereignty a central tenet of future transmission decision-making processes by launching an initiative to adopt a Tribal Consultation Policy and identify options for transmission planning and implementation Co-Management Agreements. (4) Work with Tribal Nations and local communities to ensure future planning continues to increase reliability and energy justice in the broader Redwood Region.</p>	Comment noted.

2. Please provide your organization's comments on Frequency Response.

No	Submitting Organization	Comment Submitted	CAISO Response
2A	ACP-California	No comment	
2B	AES	No comment	
2C	Bay Area Municipal Transmission Group (BAMx)	No comment	
2D	California Community Choice Association	No comment	
2E	California Public Utilities Commission - Energy Division	No comment	
2F	California Public Utilities Commission - Public Advocates Office	No comment	
2G	California Wind Energy Association	No comment	
2H	Catherine Buchanan	No comment	
2I	CEERT and LEAP	No comment	
2J	County of Humboldt	No comment	
2K	Equinor US LLC	No comment	
2L	Fervo Energy Company	No comment	
2M	Golden State Clean Energy	No comment	
2N	LS Power	No comment	
2O	LSA	No comment	
2P	Northern California Power Agency	No comment	
2Q	Offshore Wind California	No comment	
2R	Redwood Region Partners	No comment	
2S	RWE Renewables	No comment	
2T	San Diego Gas & Electric	No comment	
2U	San Francisco Public Utilities Commission	No comment	
2V	Silicon Valley Power	No comment	
2W	Smart Wires Inc.	No comment	
2X	Sonoma Clean Power Authority	No comment	
2Y	Southern California Edison	No comment	
2Z	Tejon Ranch Company	No comment	

No	Submitting Organization	Comment Submitted	CAISO Response
2AA	Transmission Agency of Northern California	No comment	
2BB	Vineyard Offshore, LLC	No comment	
2CC	Pacific Gas & Electric	No comment	
2DD	Natural Resources Defense Council, Inc.	No comment	

3. Please provide your organization's comments on Maximum Import Capability Expansion Requests.

No	Submitting Organization	Comment Submitted	CAISO Response
3A	ACP-California	ACP-California does not have specific comments on the MIC Expansion Requests but, as discussed more below, seeks additional transparency on how CAISO plans and considers MIC Expansions that are driven by the CPUC portfolios.	The comment is noted and the CAISO believes the new improvements in section 6.1.2 provide the additional transparency stakeholder were looking for. Please let us know how we can further improve on the current format and data.
3B	AES	No comment	
3C	Bay Area Municipal Transmission Group (BAMx)	No comment	
3D	California Community Choice Association	No comment	
3E	California Public Utilities Commission - Energy Division	<p>CPUC staff appreciates the explanations of MIC expansion and the development of incremental transmission capacity needed to support the Long Lead-Time resources mapped in the policy- and reliability-driven base case portfolio, while preserving the existing transmission capacity that has been allocated to other projects earlier in the interconnection queue.</p> <p>We note that the CAISO's analysis shows that MIC in the key import areas cannot be increased without already approved or additional upgrades, and that requests for MIC increases in 2024-2026 have mostly been denied. The draft report also notes MIC expansion requests on their own cannot trigger transmission expansion.</p> <p>CPUC staff appreciates the ongoing coordination and collaboration with CAISO staff to improve the incorporation of MIC expansion analysis into the TPP portfolios transmitted to the CAISO and seek to continue to work with CAISO to improve the alignment of the TPP portfolios with identified potential MIC expansion needs where appropriate.</p>	<p>Thank you for your comments and support</p> <p>CAISO appreciates the coordination with the CPUC in these matters and looks forward towards future collaboration.</p>
3F	California Public Utilities Commission - Public Advocates Office	No comment	
3G	California Wind Energy Association	No comment	
3H	Catherine Buchanan	No comment	
3I	CEERT and LEAP	No comment	

No	Submitting Organization	Comment Submitted	CAISO Response
3J	County of Humboldt	No comment	
3K	Equinor US LLC	No comment	
3L	Fervo Energy Company	Fervo would like to thank the CAISO for its consideration of our MIC Expansion Requests. We greatly appreciate the coordination with the CAISO to understand the impact of MIC Expansion Requests and next steps to assure deliverability. Fervo would like to request additional transparency on how CAISO plans and considers MIC Expansion Requests and how these requests can be best coordinated between the CAISO and the CPUC portfolios.	Thank you for your comments and support. MIC expansion request submitted to the CAISO are studied on top of the CPUC portfolio (if they are not already included in the CPUC portfolio). Only the portfolio drives new transmission, the MIC expansion requests (not included in the portfolio) are either approved or denied. For approval, they must pass the NQC, TPP and GIP deliverability studies.
3M	Golden State Clean Energy	No comment	
3N	LS Power	Please provide additional clarity on the timing of MIC availability and allocation to support the CPUC portfolio amounts for WY and ID wind in the Final 2023-2024 Transmission Plan. Please include information on the timeline for the Lugo-Victorville upgrade and any other upgrades required to meet the CPUC portfolio requirements for WY and ID wind. Please also address the timeline for GIP deliverability studies and the implications of those studies on the allocation priority for the portfolio MIC amounts.	The 2023 portfolio mapping has all WY and ID wind mapped to HA500_ISL (HA500) as a proxy scheduling point. When additional scheduling points become available the CAISO will reassign those MIC increases to those new interties as appropriate. For details, please see Table 6.1.5 in page 130 of the ISO 2023-2024 Transmission Plan. GIP deliverability studies follow their own schedule. Later queued resources will not impact an earlier priority MIC increase. If earlier queue resources along with the portfolio increases require additional transmission in order to be deliverable than new policy upgrades will need to be approved (for details see Reliability Requirements BPM section 6.1.3.6 page 71).
3O	LSA	No comment	
3P	Northern California Power Agency	No comment	
3Q	Offshore Wind California	No comment	
3R	Redwood Region Partners	No comment	
3S	RWE Renewables	No comment	
3T	San Diego Gas & Electric	No comment	
3U	San Francisco Public Utilities Commission	No comment	
3V	Silicon Valley Power	No comment	
3W	Smart Wires Inc.	No comment	
3X	Sonoma Clean Power Authority	No comment	
3Y	Southern California Edison	No comment	
3Z	Tejon Ranch Company	No comment	

No	Submitting Organization	Comment Submitted	CAISO Response
3AA	Transmission Agency of Northern California	No comment	
3BB	Vineyard Offshore, LLC	No comment	
3CC	Pacific Gas & Electric	PG&E requests the CAISO provide additional clarity around Maximum Import Capability (MIC) availability to support the CPUC portfolios amounts, including Wyoming and Idaho wind resources in the 2023-2024 TPP. This includes clarity on the timeline for any upgrades required to meet these CPUC portfolios and the timeline for the Generation Interconnection Procedures (GIP) deliverability studies and implications of those studies on the allocation priority for the portfolio MIC amounts.	See response to section 3N above.
3DD	Natural Resources Defense Council, Inc.	No comment	

4. Please provide your organization's comments on Policy-driven Projects Recommended for Approval.

No	Submitting Organization	Comment Submitted	CAISO Response
4A	ACP-California	ACP-California appreciates CAISO's diligent work on the 2023-24 Draft Transmission Plan and supports the recommended approval of transmission to accommodate Offshore Wind resources in the North Coast as an important first step that provides flexibility and will support the grid by strengthening the backbone transmission system. We also seek additional transparency and clarity from CAISO around MIC expansions and how those are planned for, especially as it relates to the prior Draft Transmission Plan's (2022-23) recommendation of the Trout Canyon – Lugo line, which was ultimately held, and now no major transmission is deemed necessary in that region in the 2023-24 TPP.	The comment has been noted.
		<i>CAISO's Proposed Solution for Offshore Wind in Humboldt is an Imperative First Step Which Provides Flexibility and Overall Benefits to the Grid</i>	See response to 3A above.
		ACP-California greatly appreciates CAISO's proactive and strategic approach to recommending approval of transmission infrastructure to support Offshore Wind in the North Coast. The solution set proposed for approval by CAISO is a critical first step to meeting the state's OSW goals and providing California access to a high quality, large-scale offshore wind resource that will add diversity to the system. The proposed solution set (referred to as "Option E") includes: a 500 kV AC line from Humboldt to Fern Road, a new line from Humboldt to Collinsville (initially operated as AC but able to convert to HVDC), and a new 500 kV Substation at Humboldt along with a phase shifting transformer. This solution set offers significant benefits, including its flexibility. The ability to convert one of the lines to HVDC, when needed, will provide flexibility to integrate more resources in the future. Thus, the proposed solution can accommodate additional OSW lease areas in the region in the future. This option also provides valuable support to the backbone of the transmission grid and therefore offers significant benefits to the CAISO grid as a whole. ACP-California commends CAISO for identifying these projects ("Option E") as the preferred	The comment has been noted.

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>alternative for integrating North Coast OSW. We also hope to continue to work with CAISO to evaluate a broader range of upgrades that will be needed in both the North and Central Coast to meet the overall OSW planning goals. In the Central Coast, in particular, ACP-California urges CAISO to continue past discussion with leaseholders in the region, and build upon past TPP sensitivity studies, to examine the value of a new substation and reinforcement between Diablo Canyon and Morro Bay, which will be necessary to support interconnection of the full capacity of offshore wind available in the Morro Bay lease areas.</p> <p>Finally, with respect to the elements of the Offshore Wind transmission solutions that will be up for competitive solicitation, CAISO should also consider providing additional time for the responses to the competitive solicitation to ensure that the bids submitted are as robust as possible.</p> <p><i>CAISO Should Provide Additional Transparency on how it Plans for MIC Expansions Needed to Accommodate the CPUC Portfolios and Explain if the Use of a RAS in East of Pisgah Area is Sufficient to Address MIC Needs</i></p> <p>The Draft 2022-23 Transmission Plan included a recommendation to approve a new 500kV transmission line between Trout Canyon – Lugo. After alternative options were proposed for additional consideration, the project was <u>not</u> included in the Final 2022-23 Transmission Plan ultimately approved by the CAISO Board. And, in reassessing the needs in the 2023-24 TPP, CAISO has found that some modifications to the resource mapping and assumed pre-existing transmission mean this line is no longer necessary. In the 2023-24 Draft Transmission Plan, CAISO recommends relying on the existing Lugo – Victorville Remedial Action Scheme (RAS) to mitigate overloads and finds no transmission upgrade is required at this time.</p>	<p>The comment has been noted.</p> <p>See response to 3A above.</p> <p>The current need for MIC expansion due to the main portfolio can be accommodated without a new 500kV transmission line between Trout Canyon and Lugo, as proven by the TPP deliverability study.</p> <p>The same MIC expansion needs to go through the GIP deliverability study. If it passes, then no additional upgrades are need for this MIC portfolio expansion. If earlier queue resources along with the portfolio increases require additional transmission in order to be deliverable then new policy upgrades will need to be approved (for details see Reliability Requirements BPM section 6.1.3.6 page 71). That mitigation could be the same project as proposed before or a different project.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		While ACP-California understands this recommendation, we also seek additional clarity on how CAISO is considering MIC expansions that may be necessary (and would be supported by a transmission upgrade but would not be accommodated by utilization of an existing RAS). The Trout Canyon – Lugo 500 kV line would have improved deliverability of resources in the GridLiance West/Valley Electric Association area and provided additional opportunities for future transmission expansion to access geothermal resources in Nevada. The policy need for the line included accommodating in-state and out-of-state resources. And it is unclear how the RAS can accommodate these same needs. To help stakeholders better understand CAISO's process for assessing transmission expansion to accommodate higher levels of MIC, we ask that CAISO provide additional transparency on whether expanded MIC is needed for the base case and, if so, how the projects recommended for approval will achieve that objective. For this area, in particular, it would be helpful to include additional discussion on the curtailment of the MIC expansion request and how MIC expansion needs have changed from the 2022-23 assumptions to the 2023-24 assumptions.	
4B	AES	No comment	
4C	Bay Area Municipal Transmission Group (BAMx)	<p>Guardrails Are Needed to Ensure that Offshore Wind-Driven Transmission does not Become Stranded</p> <p>BAMx fully appreciates CAISO's due diligence in selecting a transmission project to identify the needed transmission infrastructure to access the offshore wind resources assumed in the CPUC IRP portfolios in compliance with the NERC and CAISO planning standards. Although the CAISO-recommended Option (Option E) to interconnect the new Humboldt 500kV substation to Fern Road and Collinsville is more cost-effective than the other four transmission options considered by the CAISO,^[1] we should recognize that this transmission to accommodate 1,460MW of full capacity delivery status offshore wind resource is by far the most expensive resource in terms of the transmission cost it would trigger. See the table below, which shows that the transmission cost for the Humboldt area offshore</p>	The ISO acknowledges and appreciates stakeholder concerns expressed through the transmission planning stakeholder process regarding the inherent uncertainty with the development of new technologies such as floating offshore wind off the California coast. In balancing the need to engage promptly on long lead time transmission yet remain in step with the numerous other parallel development paths needed to enable offshore wind to develop, the ISO is committed to both seeking to prudently manage expenditures that could be the subject of cost recovery processes, as well as providing industry transparency on the pace of transmission development activities and associated cost exposure. Accordingly, the functional specifications for these projects set out additional informational expectations to facilitate these efforts, and the ISO will explore how best provide industry transparency once a project sponsor has been selected through the ISO's competitive process.

No	Submitting Organization	Comment Submitted	CAISO Response																																		
		<p>wind is in the range of ~\$50/MWh, which is considerably higher than any out-of-state or even offshore wind (OSW) in the Central Coast. Furthermore, it demonstrates a significant pitfall in the transmission capability estimates provided by the CAISO to the CPUC in developing the IRP portfolios. In particular, the CAISO's latest transmission capability indicates that the transmission to access 2,000MW of Humboldt offshore wind would cost \$2,300 million, translating to approximately \$18.4/MWh. However, the CAISO recommended transmission under the Draft Plan would cost as high as \$49.80/MWh, 170% higher than the original estimate even after considering the higher capacity factor of Humboldt/North Coast wind resource relative to the other resources. Moreover, these transmission costs do not include the onshore export cables required to deliver the offshore wind to the onshore substation, such as the Humboldt 500kV substation. This demonstrates the need for a more robust transmission scope and costs into the CPUC IRP process.</p> <p>Table 1: A Comparison of Different OOS and Offshore Transmission Costs</p> <table> <tr> <th rowspan="2">Wind Resource</th><th rowspan="2">Capacity Factor (%)</th><th colspan="2">Transmission Cost</th></tr> <tr> <th>\$/kW-Yr</th><th>\$/MWh</th></tr> <tr> <td>Idaho Wind*</td><td>34%</td><td>\$60.61</td><td>\$20.35</td></tr> <tr> <td>Wyoming Wind*</td><td>49%</td><td>\$118.80</td><td>\$27.68</td></tr> <tr> <td>New Mexico Wind*</td><td>46%</td><td>\$71.20</td><td>\$17.67</td></tr> <tr> <td>Morro Bay Offshore**</td><td>46%</td><td>\$3.42</td><td>\$0.85</td></tr> <tr> <td>Humboldt Bay Offshore Wind**</td><td>58%</td><td>\$130.24</td><td>\$25.63</td></tr> <tr> <td>Humboldt Bay Offshore Wind CAISO Estimate***</td><td>58%</td><td>\$93.50</td><td>\$18.40</td></tr> <tr> <td>Draft Transmission Plan Humboldt Bay Offshore Wind****</td><td>58%</td><td>\$253.01</td><td>\$49.80</td></tr> </table>	Wind Resource	Capacity Factor (%)	Transmission Cost		\$/kW-Yr	\$/MWh	Idaho Wind*	34%	\$60.61	\$20.35	Wyoming Wind*	49%	\$118.80	\$27.68	New Mexico Wind*	46%	\$71.20	\$17.67	Morro Bay Offshore**	46%	\$3.42	\$0.85	Humboldt Bay Offshore Wind**	58%	\$130.24	\$25.63	Humboldt Bay Offshore Wind CAISO Estimate***	58%	\$93.50	\$18.40	Draft Transmission Plan Humboldt Bay Offshore Wind****	58%	\$253.01	\$49.80	<p>The ISO notes that the ISO transmission capability estimates used to develop the 2023-2024 portfolios did not include information regarding the Humboldt OSW constraint.</p> <p>As noted by the CPUC in the 2_CAIISO_Tx_Constraints tab of its portfolio dashboard workbook for the 2023-2024 TPP, transmission capability and cost information for the Humboldt Offshore Wind Line (Proposed) is an update added by the CPUC based on the [2021-2022] TPP report. CPUC further notes in its Modeling Assumptions for the 2023-2024 TPP "Though the RESOLVE model had to utilize one of the three North Coast Upgrades identified in the 2021-2022 TPP offshore wind sensitivity results in its modeling of offshore, CPUC staff are not recommending that specific transmission option or any transmission option." The 2021-2022 TPP report identified three alternatives for Humboldt offshore wind with costs ranging from \$2.3 billion to \$4.0 billion without selecting the preferred development. The \$2.9-\$4.1 billion cost for the recommended 500 kV alternative for Humboldt OSW in the current TPP is not far from that range while the alternative is superior to the previous alternatives in several respects.</p> <p>For an apple to apple \$/MWh comparison between the transmission requirements of OSW vs OOS wind the significant in-state transmission upgrades needed to support OOS wind such as the upgrades approved in the 2022-2023 TPP in southern California must be appropriately taken into account. It's not clear if the comparisons shown in the comment take this factor into account.</p>
Wind Resource	Capacity Factor (%)	Transmission Cost																																			
		\$/kW-Yr	\$/MWh																																		
Idaho Wind*	34%	\$60.61	\$20.35																																		
Wyoming Wind*	49%	\$118.80	\$27.68																																		
New Mexico Wind*	46%	\$71.20	\$17.67																																		
Morro Bay Offshore**	46%	\$3.42	\$0.85																																		
Humboldt Bay Offshore Wind**	58%	\$130.24	\$25.63																																		
Humboldt Bay Offshore Wind CAISO Estimate***	58%	\$93.50	\$18.40																																		
Draft Transmission Plan Humboldt Bay Offshore Wind****	58%	\$253.01	\$49.80																																		

No	Submitting Organization	Comment Submitted	CAISO Response																									
		<div><p>* Source: Inputs & Assumptions, 2022-2023 Integrated Resource Planning (IRP), October 2023</p><p>** Converted from \$/KW Source: Inputs & Assumptions, 2022-2023 Integrated Resource Planning (IRP), October 2024</p><p>*** Source: CAISO Transmission Capability Estimate as Input into 2024-2025 TPP per CPUC Dashboard 2024-2025</p><p>**** Source: Draft 2023-2024 Transmission Plan</p></div> <div><p>Table 2: Transmission capability estimates for use in the CPUC's IRP process - Revised 8/17/2023</p><table><tr><th colspan="7">Transmission capability estimates for use in the CPUC's IRP process - Revised 8/17/2023</th></tr><tr><th rowspan="2">Transmission Constraint</th><th rowspan="2">Affected Resource Locations</th><th rowspan="2">Condition Under Which Constraint is Binding (On peak and/or Off peak)</th><th colspan="2">Estimated FCR Capacity Based on On-peak Study Resource Output (\$/MW)**</th><th colspan="2">ADNU & Cost Estimate (\$/MW)</th></tr><tr><th>Transmission Plan Capacity</th><th>Incremental due to ADNU</th><th>ADNU (Time to Construct or RIG)</th><th>Cost (2023)**</th></tr><tr><td>Humboldt Offshore Wind constraint</td><td>North of Greater Bay Area</td><td>On Peak</td><td>0</td><td>2,000</td><td>New Offshore Transmission Line (120 months)</td><td>\$1,800</td></tr></table></div> <p>Theoretically, a resource could be justified with a very high transmission cost if it's very economical. BAMx also recognizes that there could be economies of scale that would drive down the resource costs over time. However, we know this is not the case for offshore wind. Based on the most recent 2023 National Renewable Energy Laboratory (NREL) Annual Technology Baseline (ATB), OSW's expected costs are significantly higher than its competing resources across the modeling horizon.^[2] As a result, the initial proposed Base portfolio and the Sensitivity portfolio in the CPUC Draft Base portfolio selected no OSW resources in the North Coast.^[3] Ultimately, by selecting 1.6GW of OSW on the North Coast in the 2024-2025 TPP, the CPUC Decision ignored its own criteria for resource selection, which requires procuring at the lowest possible cost, in favor of consistency with its past selection in the 2023-2024 TPP base case.^[4]</p> <p>The recent cancellation of two large OSW projects in New Jersey, whose financial challenges mirror those facing the U.S. OSW market, is still in its infancy.^[5] The same company is also reconsidering two more OSW projects intended to serve New</p>	Transmission capability estimates for use in the CPUC's IRP process - Revised 8/17/2023							Transmission Constraint	Affected Resource Locations	Condition Under Which Constraint is Binding (On peak and/or Off peak)	Estimated FCR Capacity Based on On-peak Study Resource Output (\$/MW)**		ADNU & Cost Estimate (\$/MW)		Transmission Plan Capacity	Incremental due to ADNU	ADNU (Time to Construct or RIG)	Cost (2023)**	Humboldt Offshore Wind constraint	North of Greater Bay Area	On Peak	0	2,000	New Offshore Transmission Line (120 months)	\$1,800	
Transmission capability estimates for use in the CPUC's IRP process - Revised 8/17/2023																												
Transmission Constraint	Affected Resource Locations	Condition Under Which Constraint is Binding (On peak and/or Off peak)	Estimated FCR Capacity Based on On-peak Study Resource Output (\$/MW)**		ADNU & Cost Estimate (\$/MW)																							
			Transmission Plan Capacity	Incremental due to ADNU	ADNU (Time to Construct or RIG)	Cost (2023)**																						
Humboldt Offshore Wind constraint	North of Greater Bay Area	On Peak	0	2,000	New Offshore Transmission Line (120 months)	\$1,800																						



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>York and Maryland.[6] As we know, the East Coast has long been considered a prime location for OSW. Much like the North Sea, its waters are relatively shallow, ideal for turbines. However, cancellations to planned projects are occurring after years of development work, even under these more favorable conditions. There are considerably more technological, permitting, and environmental challenges to the OSW development in the Pacific than those on the East Coast As included in the CAISO January 4th 20-Year Transmission Outlook Update presentation, access to OSW highly depends on the feasibility of the floating offshore turbines on a large scale and other transmission technologies, such as the availability of floating offshore HVDC technology.</p> <p>BAMx is fully aware of the California Energy Commission's effort to develop a strategic plan for offshore wind development in compliance with AB 525.[7] However, it is important to recognize the series of challenges to delivering, transmitting, and producing electricity from OSW plants, especially floating OSW. As stated in the "West Coast Offshore Wind Transmission Literature Review and Gaps Analysis." prepared by the Pacific Northwest National Laboratory ("PNNL Report," hereafter)[8], a considerable amount of work needs to be completed before choosing the preferred transmission option(s) for OSW. In particular, the PNNL Report identifies the following challenges for OSW plants.[9]</p> <ol style="list-style-type: none"> 1. Lack of prioritization for interregional coordination; 2. Limited representation of future supply and demand patterns; 3. Lack of technological readiness of floating transmission and OSW plant infrastructure, and undefined viable subsea cable routes; and 4. No validation of OSW generation attributes, etc. <p>As the PNNL report summarizes, "If guided intentionally, offshore wind may provide critical contributions to the bulk electricity transmission system through geographic and</p>	<p>The comment has been noted</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>technological diversity. However, modifying transmission systems to accommodate these resources incurs long planning processes, uncertain siting requirements and construction timelines, and potentially high costs." Significant uncertainty and challenges exist around OSW wind resource development, as identified in the PNNL Report, especially on the North Coast. Approving major transmission infrastructure based on speculative resource development may lead to underutilized assets at ratepayers' expense, if not stranded.</p> <p>The Draft Plan states that the (recommended offshore wind transmission (Option E) "Ensure(s) transmission will not be stranded in the event that offshore wind does not get developed as quickly as anticipated or if it shifts to a different call area."^[10] However, it does not illustrate what it means by this statement. It does not justify the use for other call areas. Nor does it address the issue of offshore wind not being developed in any of the call areas within the North Coast at the scale anticipated in the Base portfolio. To BAMx's knowledge, no other resources can be developed in the Humboldt area that can displace offshore wind to repurpose the recommended transmission effectively. The CAISO needs to clearly lay out the following before approving the recommended Option (Option E) to Interconnect Humboldt to Fern Road and Collinsville, as well as the additional projects triggered by the Humboldt offshore wind resources.</p> <ol style="list-style-type: none"> 1. How would the CAISO revisit and, if necessary, cancel the recommended project if the offshore wind is no longer possible at the scale currently envisioned? 2. Integrating North Coast OSW is a challenging objective with technical, environmental, and scheduling risks. Such risks suggest value in staging transmission improvements, where decisions on higher cost and technically challenging elements are made later in the process once better information is available. These environmental and permitting constraints have not been 	<p>The comment has been noted.</p> <p>The comment has been noted.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>considered when determining the recommended transmission option.</p> <p>3. What are the implications of the CAISO canceling the recommended project after it goes through the competitive solicitation process?</p> <p>4. Given the excessive transmission cost triggered by North Coast OSW, is the standard CAISO-wide TAC-based recovery the most equitable model, or should the CAISO explore the Subscriber Participating Transmission Owner (SPTO) Model, such as the one currently applied to the TransWest Express project and SunZia project to access OOS wind resources?</p> <p>The abovementioned questions must be answered before the CAISO management recommends the offshore wind-driven transmission projects to the Board. When these concerns are added to the fundamental flaw in selecting North is Coast OSW in the Base Case portfolio, it seems clear that approval of transmission for this area should be deferred to future TPP cycles.</p> <p>BAMx Supports the Use of Existing Lugo-Victorville RAS</p> <p>BAMx appreciates the CAISO's assessment in considering the existing Lugo Victorville RAS to mitigate the minor overloads on the Lugo Victorville 500 kV line.^[11] BAMx understands that in the 2024-2025 TPP, more resources are assumed behind the Lugo Victorville 500 kV, which could trigger additional network upgrades. We encourage CAISO to fully evaluate the multiple mitigation alternatives to address the policy and economic needs in the next TPP cycle.</p> <p>Need to Provide a Detailed Breakdown of Cost Estimates</p> <p>During the April 18th stakeholder meeting that provided the 20-year Transmission Outlook update, the CAISO included the per unit cost estimates (See Table 3 below) used to develop the cost estimates for the policy-driven project alternatives. BAMx could</p>	<p>The proposed project is a cost-effective, flexible solution to interconnect the offshore wind in CPUC base portfolio while having the flexibility for optimum expansion under various future technology development scenarios and offshore wind development levels.</p> <p>CAISO will continue to work with state agencies to ensure the timely implementation of the transmission projects.</p>



No	Submitting Organization	Comment Submitted	CAISO Response																						
		<p>replicate the capital cost for the recommended Option E interconnection. However, we could not replicate the cost of the additional mitigation upgrades, such as the North Dublin Vineyard 230 kV Reconductor and the Tesla - Newark 230 kV Line No. 2 Reconductor project. Due to this apparent inconsistency in capital cost development, please provide a detailed breakdown of the costs of all the projects recommended for approval in the Draft Plan.</p> <p>Table 3: Per Unit Cost Estimates^[12]</p> <table><tr><th>Transmission Infrastructure</th><th>Cost Estimate</th></tr><tr><td>500 kV Substation/expansion</td><td>\$100 M - \$150 M</td></tr><tr><td>500 kV AC line in the mountain</td><td>\$7 M - \$10 M/mi</td></tr><tr><td>500 kV AC line in the valley</td><td>\$5 M - \$7 M/mi</td></tr><tr><td>HVDC line onshore in the mountain</td><td>\$7 M - \$10 M/mi</td></tr><tr><td>HVDC converter station (2GW)</td><td>\$400 M - \$600M</td></tr><tr><td>HVDC converter station (3GW)</td><td>\$600 M - \$900M</td></tr><tr><td>HVDC offshore cable (2GW)</td><td>\$7 M - \$10 M/mi</td></tr><tr><td>High capacity 230 kV Cable</td><td>\$15 M - \$20 M/mi</td></tr><tr><td>Reconductor 230 kV Lines</td><td>\$3.5 M – \$4.5 M/mi</td></tr><tr><td>Reconductor 500 kV Lines</td><td>\$3.5 M – \$5 M/mi</td></tr></table>	Transmission Infrastructure	Cost Estimate	500 kV Substation/expansion	\$100 M - \$150 M	500 kV AC line in the mountain	\$7 M - \$10 M/mi	500 kV AC line in the valley	\$5 M - \$7 M/mi	HVDC line onshore in the mountain	\$7 M - \$10 M/mi	HVDC converter station (2GW)	\$400 M - \$600M	HVDC converter station (3GW)	\$600 M - \$900M	HVDC offshore cable (2GW)	\$7 M - \$10 M/mi	High capacity 230 kV Cable	\$15 M - \$20 M/mi	Reconductor 230 kV Lines	\$3.5 M – \$4.5 M/mi	Reconductor 500 kV Lines	\$3.5 M – \$5 M/mi	<p>The comment is noted.</p> <p>The per-unit cost estimates provide a high level insight into the potential cost of a transmission project in an informational study such as 20-year transmission outlook. The cost estimates for the upgrades to the existing system are provided by PTOs based on specific conditions and potential implementation challenges of a project.</p>
Transmission Infrastructure	Cost Estimate																								
500 kV Substation/expansion	\$100 M - \$150 M																								
500 kV AC line in the mountain	\$7 M - \$10 M/mi																								
500 kV AC line in the valley	\$5 M - \$7 M/mi																								
HVDC line onshore in the mountain	\$7 M - \$10 M/mi																								
HVDC converter station (2GW)	\$400 M - \$600M																								
HVDC converter station (3GW)	\$600 M - \$900M																								
HVDC offshore cable (2GW)	\$7 M - \$10 M/mi																								
High capacity 230 kV Cable	\$15 M - \$20 M/mi																								
Reconductor 230 kV Lines	\$3.5 M – \$4.5 M/mi																								
Reconductor 500 kV Lines	\$3.5 M – \$5 M/mi																								
4D	California Community Choice Association	<p><u>Introduction</u></p> <p>The California Community Choice Association (CalCCA) appreciates the California Independent System Operator</p>																							



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>(CAISO) staff's significant efforts to develop the 2023-2024 Draft Transmission Plan (the Plan). The Plan makes good progress in advancing transmission projects needed for grid reliability and needed to support 85 gigawatts of the new clean generation to meet Senate Bill 100 goals. The plan identifies 26 transmission projects, totaling an estimated cost of \$6.1 billion. Nineteen of the projects are reliability-driven and seven are policy-driven. Six of the seven policy--driven projects identified in the plan are driven by the offshore wind (OSW) generation mapped in the Humboldt call area. The cost estimate of these six projects is \$3.1-\$4.5 billion, a significant portion of the \$6.1 billion total estimated costs of the plan. CalCCA supports the adoption of the reliability-driven projects identified in the Plan. For the policy-driven projects, CalCCA recommends the approval process outlined below intended to ensure transmission planning takes into account upcoming regulatory steps likely to inform the pace of OSW development in the state.</p> <p><u>Proposed Approval Process for Policy-Driven Projects</u></p> <p>Given the significant cost associated with the policy-driven projects identified in the plan and the fact that OSW generation development across the country is still in its infancy, the CAISO should develop a two-step approval process that provides additional time for forthcoming regulatory steps to inform the pace of OSW development in the state. Pursuant to Assembly Bill (AB) 1373, the California Public Utilities Commission (CPUC) must determine if there is a need for the California Department of Water Resources (CDWR) to procure eligible energy resources, including OSW, by September 1, 2024. The direction provided by the CPUC in response to the requirements of AB 1373 will likely inform the need for OSW and at least some of the anticipated procurement steps necessary to meet such a need. The CAISO should wait to request the CAISO Board of Governors' approval of certain policy-driven projects until after September 1, 2024, to allow for additional time to take into account the direction provided by the CPUC in response to its</p>	<p>The comment has been noted. The current process reflects the transmission planning process established in the ISO's tariff.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>AB 1373 requirements. The CAISO should determine which projects to approve in May versus September as follows:</p> <ul style="list-style-type: none"> • Request Board of Governors' approval in May if a project is: <ul style="list-style-type: none"> ○ Reliability-driven; or ○ Policy-driven, identified in the plan for its ability to support the interconnection and transmission of OSW, and would have been found to provide benefits absent the inclusion of OSW in the portfolio (e.g., the interconnection of alternative clean generation downstream such as the 230 kilovolt (kV) mitigations in the PG&E North of Greater Bay Area). • Request Board of Governors' approval in September (or later in 2024 if needed) if a project is: <ul style="list-style-type: none"> ○ Policy-driven, <u>only</u> identified in the plan for its ability to support the interconnection and transmission of OSW and does not meet other policy-driven needs absent the inclusion of OSW in the portfolio. <p>Some policy-driven projects identified in the plan are driven by OSW but offer additional benefits of allowing for the interconnection of other non-OSW clean energy projects (the 230 kV mitigations in the PG&E North of Greater Bay Area). Other policy-driven projects may not provide benefits to the system absent OSW (the 500 kV infrastructure). The approach outlined above will provide the CAISO with the flexibility needed to ensure that, in the event OSW does not get developed as quickly as anticipated or shifts to a different area, transmission investments will not be stranded and will serve the purpose of integrating different sets of clean resources to the grid. Such a "least regrets" approach is prudent to support customer affordability while also developing the transmission infrastructure needed to support the interconnection of new clean generation.</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
4E	California Public Utilities Commission - Energy Division	<p>The Draft Transmission Plan identifies seven policy-driven projects, mostly associated with north coast transmission needed to accommodate offshore wind projects near Humboldt County. CPUC staff appreciates the significant amount of analysis on the various options for transmission paths for offshore wind resources that were considered by the CAISO, and we recognize that the CAISO's recommended projects are the most cost effective among all the alternatives.</p> <p>CPUC staff further notes that the uncertainty of the floating offshore wind industry development and the significant scale of the potential north coast transmission solutions (estimated up to \$4.3 billion in costs) present unusually high risks which ultimately could be borne by California ratepayers. CPUC staff anticipates closely monitoring the timing of offshore wind resource development so that these associated transmission needs are constructed on a similar pace and appropriate scale. Accordingly, CPUC staff appreciates the CAISO's recognition that there are risks of underutilization and stranded assets related to proposed north coast offshore wind-related projects and that the CAISO aims to "...ensure transmission will not be stranded in the event that offshore wind does not get developed as quickly as anticipated or if it shifts to a different call area."</p> <p>As for all transmission projects, CPUC staff encourages the CAISO to identify and implement ratepayer protection measures in the competitive bidding process, engineering, and planning and implementation phases of the transmission projects related to offshore wind. We encourage an ongoing assessment plan be established, and that any recommendations and alternatives to recommendations allow for stakeholder engagement and opportunity for input. In general, we encourage the CAISO to be as transparent as permissible under the CAISO's tariff in providing information and updates into all phases of planning and development of approved transmission projects.</p>	<p>The comment has been noted.</p> <p>See response to 4C above.</p>

No	Submitting Organization	Comment Submitted	CAISO Response
		CPUC staff anticipates working with the CAISO and other stakeholders to identify ways to provide updated guidance, beyond the approval of the 2023-2024 Transmission Plan but before any CPCN proceeding at the Commission, regarding these north coast transmission projects.	
4F	California Public Utilities Commission - Public Advocates Office	<p>Cal Advocates' comments regarding transmission investments needed to bring Offshore Wind (OSW) onto the California grid are as follows:</p> <ul style="list-style-type: none"> i. Alternative Call Areas: CAISO has stated that Alternative E of the Interconnection to Humboldt 115 kV System will "Ensure transmission will not be stranded in the event that offshore wind does not get developed as quickly as anticipated or if it shifts to a different call area."¹¹ CAISO appears to acknowledge the California Public Utilities Commission's (CPUC's) Integrated Resource Planning (IRP) portfolio resources while also anticipating that the OSW projects might need an "offramp" if the details of integrating Californian OSW change. Cal Advocates requests that CAISO provide some details on how these transmission assets would not be stranded if the location of OSW changes. CAISO should have a public plan in place for the specific proposed projects in Alternative E, in the event that the projects will not be used for the specific Humboldt wind call areas. ii. Line Routing Analysis: For the New Humboldt 500 kV substation, with a 260-mile High Voltage Direct Current (HVDC) line to the Collinsville station, Cal Advocates is concerned that there is no analysis of the feasibility of the proposed line routing. CAISO stated during the TPP Stakeholder meeting on April 9, 2024 that the routing would become clear during the competitive bidding process. However, ensuring that the proposed project is realistic before going to competitive bidding could streamline the bidding and proposal process, and prevent possible redundant line routing analysis. For 	<p>The proposed project is a cost-effective, flexible solution to interconnect the offshore wind in CPUC base portfolio while having the flexibility for optimum expansion under various future technology development scenarios and offshore wind development levels and locations.</p> <p>A high level corridor analysis has been completed by.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>this reason, Cal Advocates requests CAISO to complete a rudimentary line routing analysis.</p> <p>iii. Project Phasing: Cal Advocates also encourages phasing OSW development, and focusing development efforts in succession, rather than in parallel. This would maximize lessons learned for constructing transmission lines from the call area to land and allow CAISO and the PTOs to apply these lessons learned to subsequent OSW projects. Developing OSW in multiple call areas is important to reach California's climate change goals, but in the absence of any active floating OSW pilots in California, it would benefit the state to be deliberate about how and when it proceeds with transmission projects to bring floating OSW power to interconnection points on land.</p> <p>iv. Explore other line uses: It is possible that the proposed new transmission lines could be useful for moving power from the California-Oregon Intertie to load centers. For this reason, Cal Advocates requests further study of the potential additional line activity once the proposed OSW lines are in place.</p> <p>A. <u>Consider Alternative Financing to Manage the Ratepayer Impacts of Proposed OSW Transmission Investments.</u></p> <p>Given the significant costs and risks associated with new transmission line development, Cal Advocates supports the exploration of alternative financing for the proposed OSW investments. Alternative financing, in contrast to traditional transmission access charge cost recovery, could potentially reduce the total cost burden on ratepayers as well as assist with phasing in project debt over a greater time period. The CEC laid out a few alternative financing options in its 2023 Integrated Energy Policy Report. These options include exploring options for federal funds, issuing new bonds, allocation of funds from</p>	<p>The comment has been noted.</p> <p>The proposed project is a cost-effective, flexible solution to interconnect the offshore wind in CPUC base portfolio while having the flexibility for optimum expansion under various future technology development scenarios and offshore wind development levels and locations. The ISO will continue to coordinate with the CPUC and CEC on the portfolios related to offshore wind development.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>existing credit trading or the General Fund, or expansion of existing financing mechanisms such as the Climate Catalyst Fund at the California Infrastructure and Economic Development Bank.[2] Cal Advocates supports greater exploration of these options amongst the relevant state agencies since bonds financing for OSW transmission would result in collecting project funds not just from ratepayers and public financing for OSW would lower the total financing costs for the proposed investments.</p> <p>i. <u>Cal Advocates also requests CAISO and NorthernGrid to explore options to jointly develop OSW transmission.</u></p> <p>Both California and Oregon are pursuing OSW development in close proximity to each other at Humboldt and Brookings, respectively. Due to the proximity of these OSW development areas, the Environmental Defense Fund suggested that there is an opportunity for CAISO and NorthernGrid to jointly develop transmission to integrate OSW in Northern California and Oregon into the bulk high-voltage system.[3] Cal Advocates supports this approach since jointly owned transmission facilities can spread the cost and responsibility for owning and maintaining a transmission facility more broadly and, as a result, reduce the total project cost for California ratepayers. The Federal Energy Regulatory Commission (FERC) has also encouraged joint partnerships for interregional transmission projects to mitigate financing and siting risks associated with transmission projects.[4] Further, FERC states that “given the nature of a joint-ownership arrangement, individual parties working together may achieve efficiencies in addressing their collective transmission needs and, therefore, achieve lower overall costs compared to developing transmission facilities to resolve more individualized needs in a more piecemeal manner.”[5]</p> <p>For reference, the following are examples of successful jointly owned transmission in the west</p>	<p>See above.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>a. The Pacific Direct Current Intertie (PDCI) is an 841-mile 500 kilovolt (kV) transmission line from northern Oregon to southern California. Bonneville Power Administration, Los Angeles Department of Water and Power, Southern California Edison Company and the Cities of Burbank, Glendale and Pasadena jointly built, own, and operate this line.^[6]</p> <p>b. The Mead-Phoenix is a 256-mile 500 kV transmission line that extends from Phoenix, Arizona to the southwest of Boulder City, Nevada. Western Area Power Administration, Salt River Project, Southern California Public Power Authority, and the Cities of Modesto, Santa Clara and Redding jointly constructed and now operate and maintain this line.^[7]</p> <p>ii. <u>Cal Advocate also suggests the state agencies explore establishing a transmission authority to attract public-private partnerships and secure alternative financing for OSW development and other significant transmission investments needed to meet the state's clean energy targets.</u></p> <p>Both New Mexico and Colorado established transmission authorities to assist with new transmission developments in their states. These transmission authorities are the New Mexico Renewable Energy Transmission Authority and the Colorado Electric Transmission Authority, respectively. Both entities can issue and sell bonds to finance projects and enter into agreements with private developers to jointly develop new transmission. These entities also assist with planning and permitting new transmission development.^[8]</p> <p>The following are examples of projects in California that were developed by Joint Power Authorities in the west.</p> <p>a. The <u>California-Oregon Transmission Project (COTP)</u>, which is a 340-mile 500 kV transmission line between the California-Oregon border and Central California.</p>	See above.



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>The Transmission Agency of Northern California (TANC) planned, designed, and constructed this line for its members. These members include the cities of Alameda, Biggs, Gridley, Healdsburg, Lodi, Lompoc, Palo Alto, Redding, Roseville, Santa Clara, and Ukiah as well as the Sacramento Municipal Utility District, the Modesto Irrigation District, and the Turlock Irrigation District. The Plumas-Sierra Rural Electric Cooperative is an Associate Member.^[9] TANC now owns about 87 percent of the project, and is the project manager, coordinating the use of COTP facilities among project participants. Other participants in COTP are Western Area Power Administration, PG&E, City of Redding, and the Carmichael Water District.^[10]</p> <p>b. The <u>Southern Transmission System</u>, which is a 488-mile 500kV transmission line extending between the Intermountain Power Project and the Adelanto Switching Station. The Los Angeles Department of Water and Power operates and maintains the line.^[11] Southern California Public Power Authority joint planned, financed, constructed this transmission line for the Cities of Anaheim, Burbank, Glendale, Los Angeles, Pasadena, and Riverside.^[12]</p>	
4G	California Wind Energy Association	<p><u>Proposed Humboldt Upgrades</u></p> <p>CalWEA appreciates and supports CAISO's intent to model the Humboldt offshore wind projects in the base case such that capacity will be reserved throughout the system, including downstream constraints, and we trust that CAISO will ensure that the associated TPD capacity will be reserved for these QC15 projects in new policies to be adopted in Track 3 of the 2023 IPE process.</p> <p>CalWEA is concerned, however, that the proposed upgrades intended for Humboldt offshore wind resources will be insufficient to maximize the benefits of the proposed transmission investments and will not provide sufficient certainty</p>	<p>The proposed project is a cost-effective, flexible solution to interconnect the offshore wind in CPUC base portfolio while having the flexibility for optimum expansion under various future technology</p>

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>to investors that need to be assured that deliverability capacity will be available. CAISO staff stated on the April 9 stakeholder call that deliverability upgrades will be considered in the Generation Interconnection and Deliverability Allocation Procedures (GIDAP); this is not appropriate because the deliverable capacity benefits of offshore wind are a primary driver for the inclusion of these resources in the CPUC's base case portfolio and thus should be included in the policy upgrades.</p> <p>As proposed, offshore wind injects to the bulk grid at Fern Road and Collinsville. Both upgrades push flows onto the Collinsville - Tesla 500kV line and the Windmaster-Delta Pump 230kV line. Therefore, while the upgrades would provide grid access for offshore wind, these downstream constraints would prevent offshore wind projects from delivering to CAISO loads, and thus from obtaining deliverability. Extending the upgrades to the Tesla substation is necessary to relieve the downstream constraints and enable the offshore wind projects relying on these upgrades to obtain deliverability at a low incremental cost. Without providing deliverability, there is a greater potential for stranded costs because the upgrades will not enable additional RA capacity from north of Greater Bay Area.</p> <p>To further improve the effectiveness of the TPP upgrade, CAISO should refine the design of the Collinsville substation upgrade and Humboldt-Collinsville upgrades with comprehensive planning analysis. This analysis should illuminate comparative costs and benefits, as well as siting challenges. The analysis should compare:</p> <ol style="list-style-type: none"> 1. Humboldt-Collinsville vs. Humboldt-Tesla (avoiding Collinsville) vs. Humboldt-Collinsville-Tesla 2. Different series compensation levels on the Fern Road to Tesla corridor to optimize utilization of both the 500kV path and the 230kV path transmission facilities. 	<p>development scenarios and offshore wind development levels and locations.</p> <p>The downstream constraints were also considered in the in the Policy deliverability study and necessary downstream upgrades are also recommended for approval along with the recommended 500 kV interconnection option. No additional need for downstream upgrades were identified.</p> <p>Based on PG&E Transmission Interconnection Handbook (https://www.pge.com/assets/pge/docs/about/doing-business-with-pge/g2.pdf, table G2) Tesla 500 kV substation cannot accept new</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>Regarding the new Humboldt-Collinsville 500kV line, please clarify:</p> <ol style="list-style-type: none"> 1. The cost estimate for initial AC buildout 2. The incremental capacity provided by the HVDC conversion. It seems that the limitation for accessing Humboldt offshore wind is from the outage of the Humboldt-Collinsville 500kV line. In that case, converting the line from AC to DC would not increase system capacity and would provide very little incremental benefit. That limited benefit will be even less if the upgrade is not extended to the Tesla substation. 3. How the HVDC line will be operated, such that additional benefits would be gained regardless of the selected line configuration. (We assume that, regardless of operating mode (AC or DC), the extension to Tesla would remain AC.) <p><u>Morro Bay Offshore Wind</u></p> <p>CalWEA recommends that CAISO include a 500kV switchyard at Morro Bay in the TPP, as PG&E has already advised Q14 interconnection customers to relocate from the Diablo Canyon substation to the Morro Bay substation. A 500kV substation requires up to seven years to plan and build, and thus planning should start now to enable the 3.3 GW of development by 2033 that the CPUC has included in the latest Proposed System Plan. Further, CAISO should plan for an efficient collector substation for the three offshore wind lease areas to avoid multiple smaller collectors.</p>	<p>POIs. In addition, no overloads were identified on Collinsville – Tesla 500 kV line in the study.</p> <ol style="list-style-type: none"> 1. The cost estimate in the draft plan is for the initial AC buildout 2. From NERC reliability standard, the simultaneous outage of both poles of an HVDC Bipole is considered a P7 (N-2) contingency where an outage of AC line is a P1 (N-1) contingency. 3. Only New Humboldt – Collinsville line will be converted to HVDC operation. <p>The ISO will consider expansion/re-build of the existing Diablo Canyon 500 kV switchyard or building a new 500 kV switching station in the area in the future TPP cycle to facilitate offshore wind interconnection in the Diablo area in accordance with the future policy portfolio.</p>
4H	Catherine Buchanan	No comment	
4I	CEERT and LEAP	<p>Offshore Wind Policy-Driven Transmission Projects</p> <p>A key driver of the 2023-2024 Transmission Plan is the proposed development of just over 4.7 GW of offshore wind, with 3.1 GW located along the Central Coast (the Morro Bay call area) and 1.6 GW in the North Coast area (the Humboldt call</p>	The comments have been noted.



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>area). The inclusion of offshore wind resources as part of the 2023-2024 Transmission Plan is an important part of a multi-year effort by California government to create a comprehensive course of action for the development of offshore wind.</p> <p>Developing wind generation in the deep waters off California's coast requires the installation of wind turbines on floating platforms that will be tethered to the seabed. This approach differs from development in shallower locations like the East Coast, where wind turbines have fixed bottom foundations. The California Energy Commission (CEC) acknowledges that offshore wind development off the California coast will require the construction of massive floating platforms as well as the development of vessels to tow them to the lease areas for installation.</p> <p>Other technologies, such as dynamic high-voltage cables, also need further development for the West Coast deep water environment. The CEC envisions the orderly development of the multiple components necessary for offshore wind commercialization in California. The CEC's roadmap articulates the need for close coordination between port expansion, the development of transmission infrastructure, and the maturation of offshore wind supply chains with the expectation that projects can become operational by 2035.</p> <p>In the 2023-2024 transmission planning process the CAISO staff proposed a new transmission solution to deliver 1.6 GW of energy from the Humboldt area to the CAISO bulk system. That solution consists of one 500 kV AC line to the Fern Road substation in Shasta County and a second 500 kV AC line to the Collinsville substation in the Bay Area.</p> <p>The draft Transmission Plan indicates that these proposed transmission additions would create a new parallel transmission path to the existing 500 kV lines that run down the Central Valley from the Fern Road substation to the Tesla substation. In the CAISO's view a new north-south transmission path would</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>facilitate future upgrading of the existing lines on the California-Oregon Inter tie.</p> <p>CEERT agrees that a new transmission loop would avoid the possibility that the transmission investment for offshore wind from Humboldt would be stranded in the event that the offshore wind projects do not get developed as anticipated.</p> <p>However, CEERT believes that this is not sufficient justification to build the proposed transmission projects absent more certainty regarding the development of the offshore wind resource. It seems unlikely that the Fern Road to Collinsville loop going through a new 500 kV substation in Humboldt would be as a chosen cost-effective alternative for a new north-south transmission path in the absence of the opportunity to develop the Humboldt area offshore wind resource.</p> <p>CEERT believes that it is important to start to make progress in developing transmission for potential North Coast offshore wind development. Therefore, CEERT supports the CAISO staff recommendations for the policy-driven projects included in the 2023-2024 Transmission Plan. However, CEERT believes there is substantial uncertainty that the Humboldt offshore wind resource will be operational by 2035.</p> <p>For these reasons, CEERT believes it is prudent to proceed with the award of competitively solicited transmission development agreements for the new Humboldt 500 kV substation and the 260 mile 500 kV AC line to the Collinsville substation and the 140 mile 500 kV AC line from the Humboldt 500 kV substation to the Fern Road substation. The selected developers should be encouraged to obtain necessary permits with a guarantee of cost recovery of the permitting costs. However, a final decision to proceed to construction of these projects should await further information about the viability of the Humboldt offshore wind project and its timing.</p>	<p>CAISO will continue to work with state agencies to ensure the timely implementation of the transmission projects.</p>

No	Submitting Organization	Comment Submitted	CAISO Response												
		<p>Therefore, CEERT recommends that the CAISO structure the competitive solicitation for these projects in a way that would maintain optionality for alternative projects in future transmission plans.</p> <p>PG&E Greater Fresno Area Policy-Driven Projects</p> <p>CEERT and LEAP are disappointed that the CAISO did not recommend any policy-driven transmission projects for the PG&E Greater Fresno Area. This failure to recommend any policy-driven projects comes with the recognition in the Transmission Plan that there will be substantial curtailment of renewable energy when off-peak conditions occur throughout the year. According to pages 80 and 81 of the Transmission Plan, deliverability constraints in the Greater Fresno Area would occur both during normal grid conditions and during N-1 contingencies. The following table shows the amount of renewable curtailment behind the constraint in the base case.</p> <p>PG&E Greater Fresno Area Off-Peak Deliverability Constraints</p> <table><tr><th>Constraint</th><th>Loading</th><th>Renewable Curtailment (MW)</th></tr><tr><td>Moss Landing-Las Aguilas 230 kV line</td><td>160%</td><td>408</td></tr><tr><td>Tesla – Los Banos 500 kV line</td><td>180%</td><td>9459</td></tr><tr><td>Tracy – Los Banos 500 kV line</td><td>153%</td><td>9032</td></tr></table> <p>CEERT and LEAP believe that the failure to propose policy-driven transmission projects for overloads that occur during normal operating conditions will jeopardize the potential development of the amounts of solar and battery storage</p>	Constraint	Loading	Renewable Curtailment (MW)	Moss Landing-Las Aguilas 230 kV line	160%	408	Tesla – Los Banos 500 kV line	180%	9459	Tracy – Los Banos 500 kV line	153%	9032	<p>Critical constraints identified in off peak study have been evaluated as part of the economic study. The economic study section of the Plan includes further details about the related congestion.</p>
Constraint	Loading	Renewable Curtailment (MW)													
Moss Landing-Las Aguilas 230 kV line	160%	408													
Tesla – Los Banos 500 kV line	180%	9459													
Tracy – Los Banos 500 kV line	153%	9032													



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>projects included in the base case portfolio. In addition to these base case constraints, the CAISO identified another 23 constraints which would result in substantial curtailment under N-1 conditions. Mitigation for the majority of these constraints would require the transmission owner to reconductor specific transmission lines. No mitigations are recommended.</p> <p>If this omission of recommended policy-driven mitigation measures for transmission system constraints cannot be addressed in the 2023-2024 Transmission Plan then CEERT strongly recommends that these constraints be prioritized in the 2024-2025 Transmission Plan.</p>	
4J	County of Humboldt	<p>The County of Humboldt appreciates the California Independent System Operator's (CAISO) work on the 2023-2024 Draft Transmission Plan, particularly the detailed Policy Assessment and increased focus on Humboldt Offshore Wind (OSW). Humboldt has had few major substation and transmission upgrades since the mid-20th-century, and the county is greatly in support of upgrades in the region.</p> <p>The CAISO Should Consider Design Options that Maximize Flexibility</p> <p>Due to existing transmission capacity issues, Humboldt County currently cannot provide electricity to new services in parts of the county, specifically in Southern Humboldt where a new hospital is planned, new businesses are looking to open and housing is desperately needed. In addition, many parts of the county do not even have access to the grid. Offshore wind transmission must be designed and sited intentionally to enhance energy access, resilience, reliability and affordability; provide for the infrastructure necessary to support the incoming economic development through new loads (e.g. expanded housing and commercial development, transportation and building electrification, essential services, data centers) and the development of local renewable energy resource interconnection (e.g. microgrids, solar, storage technologies) to enable communities to affordably meet their energy needs through local</p>	<p>The load driven concerns are assessed in the reliability assessment part of the TPP, which utilizes CEC approved demand forecast. To help the Humboldt local transmission system, recommended offshore wind interconnection option includes connection between the new proposed Humboldt 500 kV station and the existing Humboldt 115 kV substation through a phase shifting transformer. This will bring a new source into the Humboldt system.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>generation. In short, the CAISO needs to ensure that transmission is built with provisions for straightforward and timely connection of new loads and resources.</p> <p>In addition, to prepare for a variety of OSW scale scenarios, the county supports alternatives that include downstream upgrades, such as reconductoring projects. These would relieve the deliverability constraints in the Northern PG&E transmission systems and allow for the long-delayed development of generation projects along selected transmission corridors.</p> <p>Specifically, if reconductoring provides sufficient capacity for Humboldt OSW, even if there is a slight cost premium, it should be considered due to the deliverability benefits to the region.</p> <p>CAISO Should Reconsider Geothermal Upgrades</p> <p>The County of Humboldt joins RCEA in being supportive of Sonoma Clean Power's efforts related to geothermal development, which cannot occur without significant transmission upgrades. Like OSW, geothermal resources have very little siting flexibility, and as such, require dedicated transmission planning. The County of Humboldt encourages CAISO to adopt a similar approach to geothermal as we request for OSW: that is, any transmission upgrades must allow for deliverability improvements to constrained regions and new opportunities for interconnection for other resource types.</p>	<p>The CAISO performs Policy assessment using resource portfolio provided by CPUC. The assessment results and corresponding recommended mitigations are consistent with the transmission upgrade needed to support deliverability of such resources.</p>
4K	Equinor US LLC	<p>Equinor appreciates the opportunity to offer comments to the CAISO on the Draft TPP with regards to the transmission plan for offshore wind in the Humboldt area. This is an important first step that provides necessary infrastructure for delivery of clean energy to load centers in the northern part of California, including the greater bay area. This transmission project provides very useful information about the cost of transmission to deliver offshore wind and its impacts on ratepayers.</p>	<p>The comment has been noted</p>
4L	Fervo Energy Company	<p>Fervo appreciates CAISO's diligent work on the 2023-24 Draft Transmission Plan and hopes to contribute to policy-driven project recommendations in future cycles. While all policy-driven</p>	<p>The comment is noted.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>projects recommended for approval this year are located in the northern part of the state with objectives to accommodate Offshore Wind, Fervo would like to highlight the availability and growing geothermal energy resources in the Southwestern United States that could assist in meeting critical California clean energy policy objectives.</p> <p>Fervo's Cape Station Project, as mentioned earlier, will deliver 400 megawatts of zero-emitting clean firm resources to California by 2028, fulfilling 40% of the LSE's midterm reliability procurement obligation ordered by the CPUC in D. 21-06-035. Fervo is optimistic that development of our zero-emitting clean firm resource will continue at scale and continue to support California in meeting its ambitious goals. We hope to support the CAISO in coordinating policy-driven transmission projects that will continue to show results in meeting these goals by their desired deadlines. We hope to work with CAISO to evaluate a broader range of upgrades that will be needed in the Southwestern regions of the state to meet geothermal energy planning goals.</p> <p>Along these lines, Fervo asks that CAISO provide more transparency on its plans for MIC expansions needed to accommodate CPUC portfolios and its plan if the use of the Remedial Action Schemes (RAS) in regions such as East of Pisgah Area. Fervo seeks additional clarification on how CAISO is considering MIC expansions that may be necessary (and would be supported by a transmission upgrade but would not be accommodated by utilization of an existing RAS). The Trout Canyon – Lugo 500 kV line would have improved deliverability of resources in the GridLiance West/Valley Electric Association area and provided additional opportunities for future transmission expansion to access geothermal resources in Nevada. The policy need for the line included accommodating in-state and out-of-state resources. And it is unclear how the RAS can accommodate these same needs. To help</p>	<p>See responses to 3A, 3N and 4A above.</p>

No	Submitting Organization	Comment Submitted	CAISO Response
		stakeholders better understand CAISO's process for assessing transmission expansion to accommodate higher levels of MIC, we ask that CAISO provide additional transparency on whether expanded MIC is needed for the base case and, if so, how the projects recommended for approval will achieve that objective. For this area, in particular, it would be helpful to include additional discussion on the curtailment of the MIC expansion request and how MIC expansion needs have changed from the 2022-23 assumptions to the 2023-24 assumptions.	
4M	Golden State Clean Energy	No comment	
4N	LS Power	No comment	
4O	LSA	<p>The Large-scale Solar Association (LSA) urges CAISO to establish a contingency plan to minimize the risk of stranded assets if offshore wind does not materialize where and when expected. LSA acknowledges that CAISO has the authority to reserve transmission for resources included in the CPUC's resource plan that have limited geographic alternatives. However, offshore wind is still a relatively new technology with significant uncertainty about where and when it will be developed. The California Energy Commission has documented some of the challenges associated with forecasting offshore wind development in its AB 525 Interim Reports.^[1] These reports describe challenges like the potential impacts on coastal resources, opportunities for suitable sea space, the need for continued expansion of the supply chain, and availability of federal tax incentives after 2025, all of which could impact offshore wind projections.^[2]</p> <p>In addition, CAISO's projected cost for building the infrastructure needed to support offshore wind is significant, totaling over \$4 billion, and the timeline for constructing the proposed upgrades is over 10 years with in service dates in 2035. Considering the uncertainties inherent in developing new offshore wind technologies and the high price tag and long timelines needed to build the transmission, CAISO has an obligation to establish a contingency plan to protect ratepayers from the risk of building</p>	Please see response to 4C above.



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>transmission assets that could become stranded if offshore wind does not materialize as expected.</p> <p>LSA recommends the following actions:</p> <ol style="list-style-type: none"> 1. CASIO should provide more explicit information about how the proposed offshore wind transmission upgrades can support other resources. For example, the final 2023-24 Transmission Plan should indicate whether lower/higher levels of offshore wind would continue to make these upgrades cost effective and how much additional solar/storage/onshore wind could be accommodated if lower levels of offshore wind are built. The CPUC has provided sensitivities showing various levels of offshore wind, which could support this analysis. This information, even if provided qualitatively, would assure stakeholders that CAISO is considering the higher levels of risk associated with approving over \$4 billion in transmission infrastructure to support an emerging technology. 2. CAISO should establish construction offramps for approved offshore wind upgrades to limit losses if the CPUC reduces the volume of offshore wind in future resource plans or if it otherwise becomes clear between planning cycles that specific offshore wind resources will not come to fruition as anticipated. If CAISO approves the proposed upgrades and proceeds to the normal TPP Phase 3 competitive solicitation process, it will select a project sponsor who would then initiate the development process. LSA recommends that CAISO establish a schedule of offramps during the construction process (e.g. at the end of design engineering and just before construction or ordering long-lead-time equipment), for potential course corrections and to give CAISO an opportunity to confirm whether the approved capacity can be used for other purposes. 3. Finally, CAISO must establish a plan to determine how to allocate deliverability created for but not ultimately 	

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>utilized by offshore wind. If CAISO approves upgrades for offshore wind but it does not materialize as expected, CAISO must determine: (1) when to allocate deliverability created for offshore wind to other resources; and (2) how to allocate deliverability to those resources fairly. CAISO staff indicated during the April 9th stakeholder call that they would include this issue in Track 3 of the Interconnection Process Enhancements initiative, which LSA supports.</p> <p>LSA appreciates CAISO's efforts to support the state's goals and the promising contributions of offshore wind but urges CAISO to do its part to understand and prepare for the uncertainty involved in creating a market for this new technology.</p>	
4P	Northern California Power Agency	No comment	
4Q	Offshore Wind California	<p>The California Independent System Operator's ("CAISO") draft 2023-2024 Transmission Plan ("Draft Plan") "identifies the next installment of critical infrastructure development that will be needed to bring historic amounts of new clean energy onto the grid, including the first projects to deliver offshore wind from California's North Coast."^[i] Offshore Wind California ("OWC") appreciates CAISO's diligent efforts to advance California's ambitious climate and energy goals, and fully supports adoption of the Draft Plan.</p> <p>To achieve net-zero emissions,^[ii] reduce direct greenhouse gas emissions by 85%,^[iii] accommodate rapid electrification of California's building and transportation sectors,^[iv] and ensure the reliability of the grid, California's energy resource mix must evolve significantly.^[v] Offshore wind will be a critical resource for achieving California's climate goals while meeting its clean-energy needs.^[vi]</p> <p>The California Energy Commission ("CEC") has set California offshore wind planning goals of up to 5 GW by 2030 and 25 GW by 2045.^[vii] To meet these goals, California cannot afford to delay investing in transmission development to support offshore</p>	The comments have been noted.



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>wind projects.^[viii] Earlier this year, the CEC published its draft AB 525 Offshore Wind Strategic Plan, emphasizing that “[l]arge investments in transmission upgrades and new transmission infrastructure will be needed to accommodate offshore wind development to meet the state’s planning goals and deliver offshore wind power to local communities and the larger grid to serve major load centers.”^[ix] As noted in a report by the Brattle Group, “[s]tarting to plan <i>today</i> for the transmission infrastructure development pathway that can integrate this [significant] amount of offshore wind generation, and do so cost-effectively over time, will achieve significant economic, environmental, and social benefits.”^[x]</p> <p>CAISO’s 2023-24 Draft Plan meets this call to action. The “policy-driven” projects identified in the Draft Plan are critical first steps for the future of offshore wind, including three major transmission lines that would deliver clean electricity generated by floating offshore wind turbines off the coast of Humboldt County. As noted by Neil Millar, CAISO’s vice president for Infrastructure and Operations Planning: “These projects off California’s North Coast area represent the first wave of development for offshore wind to meet the state’s portfolio needs while also being flexible enough to expand in the future to meet any increased requirements.”^[xi]</p> <p>California is positioned to play a critical role in enabling the scalable deployment of offshore wind technology and unlocking its broad climate, clean-energy, and grid-reliability benefits. The Draft Plan is an important milestone that demonstrates California is capable of responsibly deploying offshore wind at scale. Investing in the future of offshore wind presents significant opportunities as well as challenges. The Draft Plan’s proposed \$4.586 billion investment will deliver big benefits for residents, workers and ratepayers, and play a critical role in helping California meet its climate, clean-energy, and grid-reliability goals.</p>	

No	Submitting Organization	Comment Submitted	CAISO Response
		Accordingly, OWC commends CAISO for preparing this plan as an essential next step to meet the transmission needs of California's course and commitment to offshore wind in the State's growing clean-power portfolio. We urge the Board of Governors to adopt the Draft Plan.	
4R	Redwood Region Partners	<p>Dear Director Billinton:</p> <p>On behalf of the Blue Lake Rancheria, Environmental Protection Information Center, and the Redwood Region Climate and Community Resilience Hub, we are pleased to submit the following comments and recommendations for the California Independent System Operator's (CAISO) 2023-2024 Draft Transmission Plan (Draft Transmission Plan), developed as part of the annual Transmission Planning Process (TPP). The following comments focus on the Northern California Coast region implications of the Draft Transmission Plan.</p> <p>Background</p> <p>As a community deeply connected to and dependent on the natural world, we support urgent and immediate action to decarbonize our economy and act on climate change. Simultaneously, we are committed to working in partnership with Tribal Nations; federal, state and local agencies; community based organizations; resident groups; and developers to ensure that if offshore wind and related transmission projects both move forward, they are done so with strong community, cultural, economic, and environmental guardrails and investments, and with thorough analysis, design, avoidance, and mitigation.</p> <p>The Northern California Coast region (hereafter referred to as 'Redwood Region') has been subjected to boom-and bust industries for decades, including mining, logging, cannabis and energy production developments such as dams. Our natural resources, cultural traditions, and people have been exploited by these industries leaving a trail of damage and harm to our communities and environment. Local Tribal Nations have experienced land theft and state-sanctioned genocide, and</p>	<p>The comments have been noted.</p> <p>The comment has been noted.</p>

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>continue to face some of the highest rates of Missing and Murdered Indigenous Peoples (MMIP) in the US.</p> <p>Having expansive transmission development in the area to support wide-scale offshore wind raises concerns that past injustices will be repeated, as outlined in a recent article by local partners and the Brookings Institute (1). As such, the final Transmission Plan should provide clear direction to ensure that regional Tribal Nations and local communities are fully engaged in all aspects of the planning processes. The final Plan should also include opportunities for impacted Tribal Nations and local communities to directly participate in the competitive solicitation process that occurs in Phase 3. Finally, any transmission infrastructure deployed to facilitate the deliverability of offshore wind in the Redwood Region must prioritize serving local communities and Tribal Nations first.</p> <p>Summary</p> <p>The following list summarizes our recommendations below:</p> <ol style="list-style-type: none"> 1. Establish a diverse committee of impacted parties to ensure equitable scoring criteria are used for the Phase 3 solicitation process in addition to existing financial and technical qualification criteria. 2. Enhance the TPP process to include specific participation from Tribal Nations and local communities to assess potential local benefits and impacts. 3. Make Tribal Sovereignty a central tenet of future transmission decision-making processes by launching an initiative to adopt a Tribal Consultation Policy and identify options for transmission planning and implementation Co-Management Agreements. 4. Work with Tribal Nations and local communities to ensure future planning continues to increase reliability and energy justice in the broader Redwood Region. 	



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>Discussion</p> <p>1. We support a number of aspects of the Draft Transmission Plan</p> <p>We appreciate various aspects of the Draft Transmission Plan. Most significantly, the recommendations to invest in transmission infrastructure on the North Coast. As California adds offshore wind to diversify the state's renewable energy portfolio, we strongly support the proposed Draft Transmission Plan as a long-term strategy to retire the Humboldt Bay Generating Station (and gas generation more broadly) (2).</p> <p>The Redwood Region will require substantial transmission upgrades to facilitate offshore wind and to wean the region off of localized natural gas energy production by accessing the state-wide grid. If offshore wind is developed on the North Coast, it will have the potential to provide local capacity and infrastructure investments needed for local resiliency and energy reliability for the Redwood Region (3). Current transmission lines are insufficient to transport enough supply to meet the region's energy demand, meaning that without upgraded transmission lines or large-scale, consistent, and localized renewable energy production, the Region cannot reach its emissions goals, which are particularly important if this place is to become an offshore wind energy hub. The Draft Plan would make substantial progress toward mitigating this need and help ensure offshore wind infrastructure projects, such as the heavy lift marine terminal at the Port of Humboldt, are able to operate at zero emissions. Though not currently reflected in the draft plan, additional investment (i.e., a 125kV transmission line to the Samoa Peninsula) will be necessary to ensure that the heavy lift marine terminal has access to adequate electric capacity. The Samoa Peninsula is currently served by a 60kV line which will not be sufficient to completely electrify a future heavy lift marine terminal. Further, due to the remoteness of certain underserved populations in the region, we need assurances that appropriate</p>	<p>The load driven concerns are assessed in the reliability assessment part of the TPP, which utilizes CEC approved demand forecast. To help the Humboldt local transmission system, recommended offshore wind interconnection option includes connection between the new proposed Humboldt 500 kV station and the existing Humboldt 115 kV substation through a phase shifting transformer. This will bring a new source into the Humboldt system. The CAISO will continue to monitor the future load growth in the region to support offshore wind development through the CEC demand forecast process and will develop transmission projects as needed in the future cycles.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>resources will be provided to secure diversified access to electrification that will be unable to be served by the grid.</p> <p>We also appreciate CAISO's effort to integrate grid-enhancing technologies (GETS) into Humboldt's power system to improve reliability (4). Infrastructure needs are great in the Redwood Region, and these needs will increase if the region becomes a central component to the offshore wind industry through port development, energy generation, supply-chain infrastructure, and the transmission needed to bring power to the central grid. Adding a phase-shifting transformer that intends to make the power grid more reliable is a great first step to improving the region's reliability. We elaborate on additional needs to improve reliability below.</p> <p>Finally, we support the Draft Plan's orientation regarding stronger coordination between CAISO, the California Energy Commission (CEC), and the California Public Utilities Commission (CPUC) to ensure consistency across planning processes (5). This not only supports an efficient and holistic planning process overall, but also improves the ability of public participation efforts as regulatory processes are overwhelming and out of reach for many stakeholders. Coordinating more closely across the agencies enables more targeted opportunities for stakeholders to engage, and for their feedback to be incorporated across various processes.</p> <p>2. We urge CAISO to establish a diverse committee of impacted parties to ensure equitable scoring criteria are used for the Phase 3 solicitation process in addition to existing financial and technical qualification criteria.</p> <p>Two proposed lines that go through the Redwood Region are required to proceed through a competitive solicitation process. As these lines transverse Tribal lands, it is imperative to include</p>	<p>The comment has been noted.</p> <p>The comment has been noted.</p> <p>The comment has been noted.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>impacted Tribal Nations and local communities as part of the solicitation process. We therefore urge CAISO to establish a diverse committee composed of Tribal Nations and local community stakeholders, similar to the CPUC procurement review groups (6). This would ensure that the solicitation language, eligible criteria, and scoring metrics are appropriately designed to meet all of the state's goals.</p> <p>While we understand that the current solicitation process is constrained and linked to the federal regulatory process, stakeholder inclusion at this stage is necessary to ensure the long-term viability and compatibility of transmission projects in the regions in which they are placed. This includes meeting Tribal, environmental, and social justice state requirements (7) in addition to ensuring bidders have the financial and technical requirements. Specifically, if CAISO has the flexibility and authority to adjust the scoring criteria, this group would help expand the qualifications criteria to attract entities with a broader commitment to cultural, environmental, and community safety and well-being.</p> <p>Specifically, the scoring criteria should go beyond the current requirements for technical, financial, and legal expertise, to prioritize bidders that</p> <ul style="list-style-type: none"> • Agree to engage in good faith negotiations with local Tribal Nations to develop tribal agreements related to co-management, co-ownership, financial resourcing options, and other areas of interest to local Tribes. • Agree to engage in good faith negotiations with community representatives to develop community benefits and mitigation agreements. • Commit to active and timely data sharing with Tribal Nations. • Commit to active and timely data sharing with interested communities. 	



No	Submitting Organization	Comment Submitted	CAISO Response
		<ul style="list-style-type: none"> • Incorporate best practices to address Missing, Murdered and Indigenous Peoples (8) and other community safety issues into company policy. • Prioritize local workforce development throughout all stages of the project • Outline and commit to a local hiring plan and targeted hiring goals for members of Tribal Nations, women, people of color, and other under-represented groups. • Describe how they would approach, resource, and commit to avoidance, minimization, mitigation, and monitoring measures and adaptive management over the life of the project . • Resolve to work in close collaboration and partnership with local Tribal Nations to protect and preserve environmental and culturally sensitive areas. • Have experience in co-designing transmission infrastructure siting for avoidance of or mitigation of impacts; co-ownership opportunities (consider the Morongo Tribe precedent (9)); co-management of right-of-ways and compensation for their expansion when traversing Tribal ancestral territories • Resolve to work in close collaboration with local governments to coordinate planning and build out efforts and incorporate local needs and interests. <p>3. CAISO should enhance the TPP process to include specific participation from Tribal Nations and local communities to assess potential local benefits and impacts.</p> <p>We understand that CAISO assesses proposed lines based on reliability-driven, economic-driven, and policy-driven approaches (10). We also appreciate that ecological assessments will be done for each individual project before commencing construction. However, we urge CAISO to enhance the TPP process by including specific participation from local Tribal</p>	<p>The ISO understands and appreciates these concerns, and intends to improve opportunities for earlier engagement with Tribal Nations, community organizations, and local governments in the next cycle (2025-2026) of the Transmission Planning Process. This process will explore joint outreach with the CPUC and other local regulatory</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>Nations, community, organizations, and governments. This could be accomplished by adding a step during Phase 2 of the TPP that involves stakeholder dialogue with Tribal Nations and local communities to assess local benefits and impacts as part of the evaluation for transmission line routes (11). We therefore request that CAISO open a docket to consider revisions to its transmission planning process structure to facilitate this additional step, similar to the 2022 initiative to facilitate transmission planning process enhancements (12).</p> <p>Such a review would allow for more targeted involvement from Tribal Nations and local communities. This effort should also provide such entities with sufficient information as early as practicable so they can fully understand the range of potential benefits and impacts of how the proposed line would affect their area (e.g., Tribal cultural sites, view sheds, etc.). This is critical as the TPP process is currently dominated by industry and utilities groups who have the resources and staffing available to participate in these processes.</p> <p>This proposed “locally-driven” evaluation step would not only assess harms and benefits to a region but also would integrate expertise that Tribal Nations and local communities have on the ground in their region – a clear need as California moves toward its renewable energy future and ensures the transition is safe, responsible, and just. Given the late date of the 2023-2024 transmission planning process, we propose that at minimum the final report should include the following language in the Executive Summary “Conclusions & Recommendations” as well as part of the Phase 2 overview of the transmission process to set forth an additional layer of analysis in future project reviews:</p> <p>“Given the growing importance of transmission expansion and the need to ensure Tribal Nations and local communities are involved in these processes, CAISO should open a new initiative in 2024 to consider enhancements to its transmission planning process for future plans. Such enhancement should include, but not</p>	<p>authorities, and the ISO will consider adding more formal opportunities for discussion with Tribal Nations and local communities prior to transmission approval.</p>

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>be limited to, (1) collaboration with impacted Tribal Nations, (2) collaboration with local communities who reside adjacent to proposed transmission development, and (3) an additional analysis of potential benefits and impacts to the region, Tribal Nations, and local communities.”</p> <p>4. We urge CAISO to make Tribal Sovereignty a central tenet of future transmission decision-making processes by launching an initiative to adopt a Tribal Consultation Policy and identify options for transmission planning and implementation Co-Management Agreements.</p> <p>We understand that the pace of CAISO’s 2023-2024 Transmission Plan resource development is driven in part by the need to address the climate crisis. In order to decarbonize the electrical grid and meet growing demand (13), the state needs to make improvements to existing transmission lines as well as introduce additional transmission lines to ensure grid efficiency. It is, however, extremely important that the transmission planning process better incorporate the interests, leadership, and decision-making authority of Tribal Nations, including meaningful consultation and Tribal agreements.</p> <p>The long history of boom-and-bust cycles of development in the Redwood Region, land theft, and state-sanctioned genocide have included unjust, inequitable transmission infrastructure development. Past transmission lines were centered around extractive industries, were planned with little regard for cultural sites and environmentally sensitive areas, and did not provide equitable access to energy for Tribal communities. To ensure this does not happen again, transmission development should be planned collaboratively with Tribal Nations using co-management models and should center and incorporate Indigenous scientific expertise, traditional knowledge, and</p>	<p>The ISO appreciates and understands this comment, and will seek to improve opportunities to incorporate the interests, leadership, and decision-making authority of Tribal Nations. We plan to engage with Tribal Nations going forward and will outline opportunities for improved Tribal outreach and engagement in the 2025-2026 Transmission Planning Process.</p> <p>The ISO’s Transmission Planning Process is governed by the ISO’s tariff, which prescribes strict criteria for use in decision-making. The ISO will work with Tribal Nations and FERC to identify any appropriate changes to the Transmission Planning Process to improve consultation and engagement</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>cultural understanding. This approach could also support incorporation of Tribal energy and climate interests into the current and future transmission plans.</p> <p>In recent years, both state (14) and federal agencies have made significant strides toward improving relationships with Tribal Nations by entering into agreements for environmental and cultural resource management. We appreciate the current effort to develop a similar Tribal Consultation Policy and strongly urge CAISO to directly collaborate with Tribal Nations as they create such a policy. In addition, we request that CAISO identify co-management options for transmission planning and implementation. Co-management agreements are imperative to recognize, uphold and honor Tribal sovereignty.</p> <p>In addition, we propose that CAISO, along with other energy agencies, draft a memorandum of understanding (MOU) that agrees to a consistent set of Tribal consultation and co-management processes. This could be modeled on the December 2022 signed MOU improving the planning coordination across CAISO, the CEC, and the CPUC (15). One key component of such an MOU is to agree to work in formal partnership with regional Tribes to assess Tribal cultural resource impacts, including identifying areas with highly sensitive cultural resources, and requiring developers to avoid or minimize impacts to these sites.</p> <p>This MOU should also incorporate the requirements that result from TPP enhancements to Phase 2 noted above, and must ensure there is consistency across state energy agency processes given the various levels of jurisdiction and approvals these projects require. For example, the CAISO's TPP authority should be coordinated with the CPUC's permitting and siting authority.</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>5. We recommend that CAISO and other energy agencies work with Tribal Nations and local communities to ensure future planning continues to increase reliability and energy justice in the broader region.</p> <p>As noted above, we appreciate the proposal for improving reliability and efficiency through grid-enhanced technologies. We also appreciate the local connection proposal. However, we note that much more is needed in the Redwood Region to ensure energy justice. In particular, the region's transmission system is limited and relatively separate from California's major transmission networks that run north and south. Most of the power is imported into the region from the east via 115kV lines, with the Humboldt Bay Generating Station, a gas-fired power plant, serving the local and regional load.</p> <p>Unfortunately, electrical infrastructure capacity in the Redwood Region is strained and underdeveloped, particularly in more rural parts of the region, reinforcing the socioeconomic gaps faced by local communities and Tribal Nations. Rural parts of the region, particularly outside of the Humboldt Bay area, consistently lose power due to natural disasters, extreme weather, and public safety power shutoffs (PSPS). This includes the north, east and southern parts of Humboldt County as well as most of Trinity County. It also includes lands of the Hoopa Valley Tribe, Karuk Tribe, Nor Rel Muk Wintu Nation, Tsnungwe Tribe, Yurok Tribe, Sinkyone territory and Mattole territory. Many areas are located at the remote end of the existing electrical grid, which imposes challenges on energy access and reliability. In addition to energy reliability challenges, the region's power infrastructure now faces additional risks from the increasing frequency and intensity of extreme weather events caused or exacerbated by climate change.</p> <p>While we appreciate the Draft Plan's proposal to deliver offshore wind to the community through a local connection, there continues to be a need for increased local connection, reliability,</p>	<p>The ISO will seek to engage with Tribal Nations going forward, including earlier outreach and engagement with Tribes regarding potential approval of transmission lines.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>as well as transmission and distribution upgrades. Ensuring a higher capacity through such improvements will help keep homes, businesses, schools, governments and communities powered. Improvements such as these will also help communities and the economy grow and support a narrowing of the rural/urban divide.</p> <p>Offshore wind and transmission deployment must also be designed and sited intentionally to enhance energy resilience, reliability, affordability, and access; provide for the infrastructure necessary to support the incoming economic development and the development of local clean energy resources (e.g., microgrids, solar, and storage technologies); avoid and minimize natural and cultural resource impacts; support rural and Tribal economic vitality and competitiveness; and enable communities to affordably meet their local energy needs through ownership of clean energy resources in order to stay safe at home in the face of increasing climate impacts.</p> <p>To support transitioning the Redwood Region to cleaner grid resources, we recommend that CAISO work with Tribal Nations and local communities to develop recommendations in the 2024-2025 transmission planning process currently underway that would address reliability inequities. This approach should also incorporate our comments noted above regarding authentic engagement and partnership with Tribal Nations and local communities.</p> <p>Conclusion</p> <p>Thank you for the opportunity to provide our comment. We look forward to working with CAISO and other interested stakeholders throughout the bidding process and exploration of 2024-2025 transmission planning process.</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
4S	RWE Renewables	<p>RWE Offshore Wind Holdings, LLC (RWE) has a leading offshore wind development portfolio in the United States and currently holds California lease area OCS-P 0561, one of the Northern California lease areas auctioned by the Bureau of Ocean Energy Management in December 2022. RWE appreciates the opportunity to provide input to CAISO's draft 2023-2024 transmission plan.</p> <p>The transmission proposal for connecting North Coast offshore wind is a significant step in helping the state achieve its GHG reduction goals, in particular by building offshore wind in line with the strategic plan outlined under Assembly Bill 525. As noted in the strategic plan, offshore wind presents an opportunity for California to continue to advance the state's clean energy and climate goals while creating economic development and workforce benefits. Delivering this plan requires not just that offshore wind projects advance in a timely fashion, but that the necessary transmission and port infrastructure enabling offshore wind construction and operation are also developed in time.</p>	The comment has been noted



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>The following recommended policy-driven projects to integrate offshore wind in the North Coast are therefore not just essential, but are urgent in paving the way to achieve California's climate goals:</p> <ul style="list-style-type: none"> • New Humboldt 500 kV substation with a 500 kV line to Collinsville [HVDC operated as AC] • New Humboldt to Fern Road 500 kV line • New Humboldt 115/115 kV phase shifter with 115 kV line to Humboldt 115 kV substation <p>1. RWE supports the proposal for new Humboldt transmission projects that both integrates North Coast offshore wind and enhances the resiliency of the local transmission system</p> <p>RWE applauds the fact that improving local grid reliability is a key consideration in CAISO's proposal for the Humboldt interconnection. Such projects are especially valuable because they not only increase the state's access to a critical resource like offshore wind but they can also deliver tangible benefits to local communities and Tribal Nations. Winning local support is a key building block of a successful project outcome, and RWE supports this win-win approach to planning.</p> <p>2. New Humboldt 500 kV Substation initial configuration needs to plan enough bays and capacity for at least two existing offshore wind leases in Humboldt area</p> <p>Per Appendix I of the draft plan, the new Humboldt 500kV substation will have a breaker and a half bus configuration with one 500/115 kV transformer and two 500kV lines initially planned. In this arrangement, three circuit breakers are used in a bay for two independent circuits. One independent circuit will be limited to connect 1,150 MW of offshore wind generation</p>	<p>This is addressed in the revised draft</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>based on the maximum generation tripping under N-1 contingency.</p> <p>RWE believes that to accommodate the three initial 500kV lines/transformers and approximately 3~4GW of offshore wind generation from two existing leases in Humboldt area, a minimum of three bays are required in the new Humboldt 500kV substation. CAISO should consider enough bays and capacity to accommodate at least the two offshore wind leases in Humboldt area and be included in the functional specification scope for the new Humboldt 500kV substation in Appendix I.2.2. We also encourage CAISO to consider future expansion for connecting Del Norte and Cape Mendocino areas.</p> <p>3. Design of transmission corridors for the first two projects should consider synergies with future expansion</p> <p>The two proposed transmission lines will require permitting and the designation of two independent transmission corridors. Traversing such long distances and crossing so many different types of land use will be a major hurdle to delivering such projects into service. Therefore, any potential synergies with future transmission expansion must be considered in developing the first two transmission corridors.</p> <p>4. Local benefits, community engagement, and tribal engagement should be considered in the competitive solicitation process</p> <p>Per the draft plan, the CAISO will initiate the competitive solicitation process for the eligible projects identified once the 2023-2024 transmission plan is approved by the CAISO Board of Governors in May, 2024. As noted in Appendix I, the CAISO recognizes there may be some uncertainty regarding routing and siting of the 500 kV AC transmission line. As such, the CAISO will seek cost and risk mitigation strategies from project</p>	<p>The comment has been noted</p> <p>The comment has been noted.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>sponsors in their bid applications in the competitive solicitation process including potential alternatives and mitigation measures.</p> <p>RWE appreciates that the CAISO is considering siting and permitting risk mitigation strategies as part of the process for evaluating project sponsors. RWE encourages including local benefits, community engagement, and tribal engagement as another critical element to ensure delivery of the approved transmission line in a timely manner. While CAISO's transmission planning process does not specifically cover the lower voltage distribution grid, improvements in the local distribution network can nevertheless be made possible by new transmission assets that are designed with this need in mind. Aligning the needs of the local distribution network through proactive engagement with Tribal Nations, local communities and other stakeholders will ensure the new transmission assets enable, rather than hinder, further improvements in the local distribution network.</p>	
4T	San Diego Gas & Electric	No comment	
4U	San Francisco Public Utilities Commission	No comment	
4V	Silicon Valley Power	No comment	
4W	Smart Wires Inc.	<p>SmartWires appreciates the opportunity to provide comments on the CAISO 2023-24 Draft Transmission Plan. Our feedback emphasizes the importance of using neutral descriptions for technologies that can fulfill the required functions, rather than specifying particular technologies. While seemingly trivial, this approach can significantly impact the implementation of approved projects, especially those with expected operation dates as far out as 2035.</p> <p>In particular, we would like to highlight the advantages of Smart Wires' SmartValve solution over traditional series compensation and flow control solutions in the context of two main projects, which are listed in the CAISO's list of Policy-driven projects recommended for approval as the "Collinsville 230 kV Reactor" and the "New Humboldt 115/115 kV Phase Shifter with 115 kV line to Humboldt 115kV Substation". Smart Wires suggests that</p>	Comment noted.



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>these projects be renamed to the “Collinsville 230 kV Series Compensation” and the “New Humboldt 115 kV Flow Control Device with 115 kV line to Humboldt 115kV Substation”. These changes would provide for more neutral descriptions of technologies.</p> <p>One of the most widely used power flow control devices is the Phase Shifting Transformer (PST). Recent industry experiences have shown increasing maintenance costs and failure rates when using PSTs to control flows in high IBR resources environments. There’s evidence for that in a DOE report on GETs (Grid Enhancing Technologies) and the recent VELCO ISO-NE presentation. Most PSTs use mechanical changes in tap position on their windings to change their phase angle, which creates a non-linear stepped change in phase angle. The resulting change in power flow from series compensation devices can also cause the control system to see an overcorrection and reverse its action, leading to hunting.</p> <p>The SmartValve solution utilizes state-of-the-art power electronics to intelligently control power flow across meshed transmission grids. Unlike traditional passive devices such as series reactors or phase shifting transformers (PSTs), SmartValve devices are active equipment that do not have the constant reactive power consumption (VAR), high losses, and large magnetic fields associated with series reactors. SmartValve technology offers operational flexibility by allowing for a continuous range of operable series compensation levels without mechanical switching, while do not pose the risk of stimulating sub-synchronous resonances (SSR). It can be dispatched from the Energy Management System (EMS) and configured to inject voltage under specific operational scenarios while remaining in monitoring mode (bypass) the rest of the time, thus minimizing system losses.</p> <p>Furthermore, SmartValve devices do not reduce short-circuit currents, which can be advantageous as the penetration of renewable generation in the form of inverter-based resources</p>	

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>(IBR) increases. This increase in IBR is expected to displace synchronous generators resulting in a general reduction in short circuit current. Traditional series reactors, by design, reduce short-circuit currents, which can exacerbate the trend towards reducing short circuit current, and lead to voltage instability and compromise the effectiveness of protective devices during fault events. In contrast, SmartValve devices inject voltage in series across their terminals and seamlessly bypass within a remarkably short time frame during fault events, ensuring minimal impact on short-circuit currents and protection relays.</p> <p>SmartValve devices are also designed for increased resilience and reliability, with maximum levels of redundancy for component failure. Each module has multiple 1 MVar converters equipped with internal bypass, preventing a single point of failure to maintain line continuity even during device failures.</p> <p>In terms of installation and scalability, SmartValve uses a modular design with standard devices, allowing for optimized sizing to match the system need. The modular design also allows for manufacturing and faster installation compared to traditional solutions. As the renewable resources increase over time, additional SmartValve devices can be added to the original deployment quickly and cost-effectively to adjust the solution as network needs evolve.</p> <p>SmartWires will be happy to provide assistance to CAISO and the transmission owner(s)/developer(s) to support the development of these projects. Thank you for your consideration of these comments, and we look forward to working with the CAISO and relevant stakeholders to cost-effectively enhance the Grid.</p> <p>If you have any questions or concerns about these comments, please contact Alex Al-Homsi at alex.alhomsi@smartwires.com.</p>	
4X	Sonoma Clean Power Authority	SCP is greatly appreciative of CAISO's excellent work in identifying the transmission infrastructure needs to deliver the CPUC's base portfolio. The CAISO's transmission planning	



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>process sets an excellent example for the rest of the nation, particularly given California is at the forefront of planning a large, highly renewable grid. The stakeholder process is also very robust — SCP particularly appreciates the written responses the team provides to feedback from past meetings. In reviewing the policy-driven upgrades for the 2023-2024 TPP, SCP offers the following comments:</p> <p><i>Support for Humboldt Alternative that Includes Downstream Upgrades</i></p> <p>SCP is strongly supportive of CAISO's preference for a Humboldt Offshore Wind alternative that includes downstream upgrades that will be necessary for near-term reliability and climate goals regardless of the scope or pace of offshore wind development. Moving forward with the 230 kV reconductoring projects that de-bottleneck the PG&E transmission system will address acute issues with deliverability in many parts of Northern California and provide both immediate and long-term benefits to meeting the state's decarbonization and reliability goals.</p> <p>The 2023 GIP process resulted in no deliverability through most of Northern California due to the Delevan-500 kV Constraint and Bay Area Constraint and the test run of Cluster 15 in the 2023 Interconnection Process Enhancements showed 89 projects will be not eligible for study due to the lack of TPD behind the Vaca Dixon-Tesla 500 kV constraint and 38 projects behind the Windmaster-Delta pump 230 kV constraint. Projects impacted by PG&E constraints in Northern California include onshore wind, geothermal, and battery storage that will be critical in advancing reliability, affordability, and climate progress and aligned with the resource needs in the Preferred System Plan. The CAISO should approve the 230 kV projects this May even if it needs to defer a final decision on the infrastructure that specifically supports Humboldt offshore wind development.</p>	<p>The comment has been noted</p> <p>The proposed project, including downstream mitigations, are a cost-effective, flexible solution to interconnect the offshore wind in CPUC base portfolio while having the flexibility for optimum expansion under various future technology development scenarios and offshore wind development levels and locations. Based on the resource portfolio studied, the CAISO didn't find need for any addition upgrade in the area.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p><i>Consider Design Options for Downstream Upgrades that Maximize Flexibility</i></p> <p>SCP encourages the CAISO to consider design options for the downstream 230 kV projects that expand their ability to alleviate system constraints and provide the flexibility to respond to changes in future policy resource portfolios. As an example, if expanding the scope of reconductoring or utilization of advanced conductors provides capacity beyond what is required for Humboldt offshore wind but provides a significant increase in near-term deliverability for the region at a small cost, those options should be explored to support a competitive diversity of resource locations and technologies that can lower total energy costs. Although the current TPP process is very proscriptive at delivering the lowest-cost solution for the CPUC's deterministic Preferred System Plan, small increases in scope that increase the long-term benefits of investments could be explored and could deliver significant value to ratepayers.</p> <p>This is particularly true in the PG&E area, where the interconnection queue demonstrates there is significant commercial interest yet the supply of resources with near-term deliverability is extremely limited. There is precedent for this approach—the CAISO's selection of an alternative for Humboldt offshore wind that can be converted to HVDC is a great example of selecting an alternative with a small cost premium but potential to provide significant value. The CAISO should consider the design upgrades to the 230 kV system through the same lens: what design configuration delivers the most long-term value to ratepayers when looking at potential needs beyond the base portfolio? Looking at the outer 2039 planning year in the forthcoming 2024-2025 CPUC portfolio could provide an indication of the potential need: the PG&E North of Greater Bay Study Area is expected to host 6.2 GW of resources vs. the 3.9 GW in the base portfolio for the 2023-2024 TPP and 4.7 GW in the PG&E Greater Bay Study Area vs. 3.3 GW in the 2023-2024 TPP. SCP asks the CAISO to consider whether using advanced conductors or reasonable adjustments to the scope of the</p>	<p>Comment noted.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>proposed 230 kV projects provide additional flexibility in the region to interconnect resources that will be needed to meet SB 100 targets and address near-term concerns on reliability and resource adequacy scarcity.</p> <p><i>Consider Additional Opportunities for Staging and Expanding Utility of Humboldt-specific 500 kV Investment</i></p> <p>SCP shares the discomfort voiced by other stakeholders with the scale of investment in infrastructure with the singular purpose of interconnecting Humboldt offshore wind—which is a project with significant technological, permitting, and commercial risks. The CPUC’s own analysis in developing the 2023 Preferred System Plan demonstrated the risk of the state changing course on offshore wind: when removing LSE plans from consideration and updating its assumptions on cost (which many still view as very optimistic), the CPUC’s cost-optimized portfolio contained no offshore wind. However, given the climate stakes and importance of achieving state reliability and climate goals, inaction is not an option in the face of uncertainty — SCP believes it is prudent to take a staged approach to expanding transmission infrastructure that can serve multiple purposes and lower the risk of creating stranded costs for ratepayers due to project delays or cancellation.</p> <p>As described above, SCP appreciates the CAISO’s selection of an alternative that includes downstream upgrades that provide utility beyond the Humboldt offshore wind project. However, the vast majority of the proposed portfolio of policy upgrades (500 kV Humboldt substation, 500 kV Humboldt to Fern Road line, and 500 kV Humboldt to Collinsville) serve the sole purpose of providing deliverability for Humboldt offshore wind (\$2.9-\$4.2 billion of the \$3.1-\$4.5 billion cost). SCP recommends that the CAISO consider design options for the 500 kV infrastructure that provide capacity for a more diverse set of resources, such as routing the Collinsville line through areas with other resource potential (onshore wind, solar, geothermal), or alongside infrastructure that is likely to be constrained at full build-out</p>	<p>Please see response to 4C above.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>(PG&E's existing 500 kV system). 500 kV infrastructure that can be approved and built first, with investment decisions on Humboldt-specific investments staged based on the maturity of the offshore wind project. Staging infrastructure investment and considering design alternatives that increase flexibility may appear more costly compared to the current alternative but will provide a more robust infrastructure plan that can adapt and respond to the many uncertainties and risks associated with the current state of California's resource planning. Those incremental costs may also be wholly offset by lower generation and capacity costs, which should be considered in finding the lowest total cost for ratepayers.</p> <p>When the infrastructure to interconnect Humboldt offshore wind is approved, SCP strongly supports CAISO's decision to include an interconnection to the Humboldt 115 kV system in-scope. As the CAISO points out, providing a local interconnection will vastly improve reliability in the region, provide capacity for load growth (which is very constrained), and provide a path to retire local gas generation.</p> <p><i>Approve 115 kV Upgrades in Geysers as Part of TPP and Consider Design Options that Increase Flexibility</i></p> <p>SCP asks that the CAISO reconsider its decision to fund local upgrades in the North of Greater Bay area on the 115 kV system through the interconnection process and approve the identified mitigations as part of this year's TPP. The base portfolio includes 179 MW of geothermal near the Geysers and a similar level of geothermal development is reaffirmed in the portfolio for the 2024-25 TPP (144 MW). SCP is working on a large initiative to attract new geothermal technologies and capacity to the region, with a goal of adding 600 MW reinforced through cooperation agreements with three geothermal developers. That initiative is quickly building momentum, with a demonstration project recently selected for award negotiations for a grant from</p>	<p>The issues observed in the area are local in nature and the CAISO believes these are appropriate to be handled through the generation interconnection process.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>the Department of Energy and significant progress by partners on site control and evaluation of technical feasibility.</p> <p>Unlike solar and storage resources, geothermal resources have limited geographic flexibility. It is critically important that adequate transmission capacity is available in areas with strong geothermal potential to attract development. In its last progress report on mid-term reliability, the CPUC reported only 358 MW of the order for 1 GW of firm zero-emission resources by 2028 was under contract. In working with its geothermal development partners, SCP has learned that a significant amount of future potential in the region is alongside the 115 kV corridor. Alleviating constraints on the 115 kV system in the Geysers and avoiding the cost and schedule risks of supporting expansion through the interconnection process could be extremely helpful in the state meeting its clean firm resource procurement requirements. There are also energy storage projects under development in the Geysers area that could benefit from the proposed mitigations, as well as a shovel-ready geothermal project in Cluster 14. There is a precedent for approving local upgrades as part of the TPP: a number of local projects to re-conductor and upgrade lines in SDG&E territory in the 2022-23 TPP is just one example.</p> <p>In finalizing the design and scope of upgrades to the 115 kV system around the Geysers, SCP asks the CAISO to take a similar perspective as described above for the 230 kV downstream upgrades—the CAISO should consider small increases to the project scope or utilization of new technologies if additional deliverability can be enabled beyond the requirements of the base portfolio. In the CPUC's high-gas retirement sensitivity for the forthcoming 2024-25 TPP, 1.07 GW of geothermal is needed in the PG&E North of Greater Bay Study Area by 2039. Leaning forward on adding incremental transmission capacity in the region where reasonable offers an opportunity to significantly de-risk the deployment of the clean firm resources the state will need by the end of the next decade.</p>	

No	Submitting Organization	Comment Submitted	CAISO Response
4Y	Southern California Edison	No comment	
4Z	Tejon Ranch Company	No comment	
4AA	Transmission Agency of Northern California	No comment	
4BB	Vineyard Offshore, LLC	<p>Vineyard Offshore, LLC (“Vineyard Offshore”) is developing one of five California offshore lease areas as a floating offshore wind project that will deliver clean, reliable power to California and will help California meet its climate targets.[1] Vineyard Offshore appreciates the opportunity to provide comments in response to CAISO’s draft 2023-2024 transmission plan[2] and emphasizes that the value of offshore wind be reflected in CAISO’s transmission planning. CAISO’s efforts to develop and refine the draft 2023-2024 transmission plan are timely and critical.</p> <p>Vineyard Offshore supports the transmission projects that cost effectively achieve the dual purposes of reinforcing the existing CAISO system and supporting the development of North Coast offshore wind. For offshore wind development, this solution provides the necessary clarity to pursue this valuable in-state resource and significant flexibility for cost effectively scaling up offshore wind capacity over time. For system reliability, it improves the reliability of the backbone 500 kV system by creating an additional north-south path and strengthening the local AC system in Humboldt County.</p> <p>CAISO’s proactive development of transmission upgrades can support multiple future offshore wind generation resources. CAISO considered several potential configurations for these upgrades throughout the stakeholder process and developed an innovative and forward-looking solution that achieves multiple benefits. Importantly, planning for the clean resources and grid investments needed through 2035 and beyond is necessary now to ensure that appropriate</p>	The comment has been noted



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>transmission infrastructure and clean energy resources are built to meet California's environmental and energy reliability goals. CAISO should continue to advance development of North Coast transmission with consideration of other long-term efforts in connection with the State's overall strategy for developing and evolving offshore wind. Vineyard Offshore emphasizes the importance of coordinated and proactive long-term transmission planning to cost effectively meet California's climate goals. Such a proactive approach to transmission planning, as reflected in CAISO's draft 2023-2024 transmission plan, is particularly vital for long-lead time resources such as offshore wind.[3]</p> <p>CAISO's proposed projects effectively plan for the resource portfolios developed by the California Public Utilities Commission ("CPUC"), including the base case with 1,607 MW of North Coast offshore wind and the sensitivity case with 8,035 MW of North Coast offshore wind. Studying the higher capacity case allows CAISO to consider the initial needs for developing North Coast offshore wind while laying the groundwork for cost effective upgrades to continue to expand North Coast offshore wind capacity in the future. Doing so results in lower costs for later phases of offshore wind capacity, de-risks future transmission upgrades for offshore wind capacity, and provides longer-term clarity for offshore wind developers. Selecting an option that can accommodate additional offshore wind capacity will promote the cost-effective offshore wind development and prepare the system to meet increasingly stringent decarbonization objectives beyond the timeframe of the current study. Vineyard Offshore appreciates CAISO's proactive approach to identifying and planning the development of solutions to comprehensively meet the future needs of the CAISO transmission system.</p> <p>Vineyard Offshore recommends that CAISO pursue approaches to maximize the utilization of the proposed policy-driven projects. To do so, Vineyard Offshore requests that CAISO identify additional headroom at the Humboldt 500 kV substation for interconnecting resources beyond 1,607 MW of offshore wind</p>	<p>This is addressed in the revised draft</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>(but prior to the AC-DC conversion of the Humboldt-Collinsville 500 kV line) and provide that information to the CPUC for use in future resource planning studies, including the resource portfolio for the 2025-2026 transmission planning process. Identifying the additional headroom allows the CPUC to maximize the utilization of the available interconnection capability at the Humboldt 500 kV substation enabled by the policy-driven projects, which will reduce the average costs of clean energy generation delivered via these upgrades.</p> <p>Vineyard Offshore recommends that the competitive solicitation process for these projects consider several important aspects of its design for future cost-effective interconnection of offshore wind resources at the Humboldt 500 kV substation. The location of the Humboldt 500 kV substation will determine where offshore wind developers must interconnect their resources. Bidders in their proposals and CAISO in its evaluation should consider the environmental impacts and permitting risks of the substation, the associated transmission lines to Fern Road and Collinsville, and the offshore wind export cables that will interconnect at Humboldt 500 kV. Consideration of these potential development factors allows relevant facilities to be built without significant delays and with support from the local communities. By way of example, we note that the ability to minimize the impacts of offshore and onshore transmission cables was a key consideration in the selection of a single corridor solution by the New Jersey Board of Public Utilities in its initial State Agreement Approach process for procuring offshore wind transmission.^[4]</p> <p>CAISO should also identify locations where there is sufficient land near the Humboldt 500 kV substation for constructing DC converter stations for the planned AC-to-DC conversion of the first Humboldt-Collinsville 500 kV line, the second DC line, and the future OSW export DC cables (as projected in the OSW Sensitivity case). We also recommend that CAISO put a significant emphasis in its evaluation on transmission developers' experience working closely with local communities</p>	<p>The revised draft includes the area for the Humboldt 500 kV substation that takes into account the implementation of the substation and future HVDC converter station along with the 500 kV ac lines, the interconnection of the offshore wind export cables.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>to build consensus on the various aspects of the design and locations of the transmission facilities.</p> <p>Vineyard Offshore will support in the technical development for the success of this project. We appreciate the opportunity to provide these comments on CAISO's draft 2023-2024 transmission plan and look forward to continuing to ensure full support of the State of California's commitment to offshore wind, including off the North Coast, through CAISO's transmission plan.</p>	
4CC	Pacific Gas & Electric	<p><u>New Humboldt Projects to Access Offshore Wind</u></p> <p>PG&E supports initiatives that help California meet its 2045 clean energy goals, and is prepared to support the infrastructure upgrades necessary to integrate offshore wind into the resource mix. As such, PG&E supports starting the transmission buildout now for Humboldt offshore wind to meet the expected timeline of the wind resources coming online in the mid- to late-2030s. However, given the unprecedented nature of these projects to interconnect a nascent technology (i.e., offshore wind on floating platforms), careful consideration of the integration process with the wind resources and associated infrastructure upgrades is essential to ensure these enhancements are both effective and economical. In recognition of the extended timeline required to implement and operationalize offshore wind resources off the California coast and the primary intent of the two recommended 500 kV Humboldt projects being to access offshore wind, it is imperative that a well-structured review plan be developed as early as possible. PG&E encourages the CAISO to develop a plan that includes an annual review of the scale and timeline of these two significant projects to ensure it is aligned with the timeline with the offshore wind projects. One approach could be a "gating" process for the two 500 kV Humboldt projects, such that if there are evident material delays in implementation of offshore wind resources or changes to the scale of resources, then appropriate schedule and/or scope modifications should be established for construction of the transmission projects.</p>	<p>Please see response to 4C above.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>Through the competitive solicitation process for the two 500 kV Humboldt projects, PG&E recommends the CAISO consider the following in its evaluation process of the project sponsor bids. First, given the route of the two new 500 kV lines will most likely traverse through Tier 2 and Tier 3 High-Fire Threat Districts, it is important the CAISO consider how the proposed projects would mitigate fire ignition risk to ensure safe and reliable service. Second, based on the long-duration timeline to develop the two 500 kV transmission projects, there is an inherent greater risk of uncertainty in the ultimate cost. Thus, PG&E suggests there be regular updates between the selected project sponsor and CAISO on the status of the projects, cost incurred to date and projected costs. Utility customers will ultimately bear the costs of the projects in rates and the ability of the selected project sponsor to pass on costs that may ultimately be drastically higher than originally expected by CAISO and stakeholders should be mitigated as much as possible before a cost recovery case is filed at FERC.</p> <p>Regarding the proposed 230 kV transmission on PG&E's existing system upgrades to address offshore wind downstream mitigation needs, PG&E recommends that a comprehensive evaluation be conducted. Given the significant capital investments involved and the existing approved projects in TPP and GIDAP, we recommend a collaborative approach between PG&E and CAISO to perform an in-depth analysis to find the optimal and cost-effective solution. Specifically, PG&E has concerns about the proposed North Dublin -Vineyard 230 kV Reconductor project with the estimated cost of \$116M - \$232M. Currently, the corridor has two other projects in the plan: the Lone Tree-Cayetano-Newark Corridor Series Compensation which is a reliability driven project and the North Dublin – Cayetano 230kV Line Reconductor project, which is primarily driven by generation interconnection needs. Therefore, we strongly recommend that CAISO conduct detailed studies to better understand the interdependencies of the constraints within this corridor. A thorough analysis is necessary to determine if the proposed reconductoring is indeed the best solution or if</p>	<p>Comment noted.</p> <p>Comment noted.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>other, more cost-effective methods could better serve the long-term needs. Additionally, understanding the long-term loading expectations for this corridor is critical. This insight will guide the selection of technology and upgrades, ensuring that the solutions are not only scalable but also capable of accommodating future capacity requirements without necessitating additional costly upgrades. To address these concerns, it is vital to assess the collective impact of these projects on the corridor's loading and reliability, rather than addressing each line in isolation. This approach will ensure that the solutions implemented will enhance the overall efficiency and capacity of the transmission network.</p> <p>In regard to CAISO's proposed Option E as the preferred alternative with 500 kV lines from new Humboldt Substation to Fern Road and Collinsville Substations, respectively. The new transmission lines will introduce a new power path in parallel to the California-Oregon Intertie (COI), with approximately 1,600 MW of offshore wind coming in as an additional source. As a result, PG&E recommends the CAISO in upcoming TPPs perform additional studies investigating different scenarios to understand if there are any unintended impacts on COI rating and Total Transfer Capability (TTC), and coordinate with the selected project sponsor(s) for the two projects to ensure there are plans to mitigate any identified impacts to COI. In addition, PG&E also recommends that Sub Synchronous Control Interaction (SSCI) and Sub-Synchronous Resonance (SSR) risk be evaluated with the selected project sponsor for the 500 kV line connecting to Fern Road Substation, where large size STATCOMs are located.</p> <p>PG&E looks forward to collaborating closely with CAISO and the selected project sponsor(s) on these evaluations. By aligning our efforts and focusing on comprehensive, forward-looking planning, we can ensure that the investments made into the grid infrastructure yield maximum benefits in terms of reliability, compliance, and economic efficiency, while supporting the state's renewable energy objectives effectively.</p>	<p>The comment has been noted</p>

No	Submitting Organization	Comment Submitted	CAISO Response
4DD	Natural Resources Defense Council, Inc.	No comment	

5. Please provide your organization's comments on the Economic Assessment.

No	Submitting Organization	Comment Submitted	CAISO Response
5A	ACP-California	No comment	
5B	AES	No comment	
5C	Bay Area Municipal Transmission Group (BAMx)	Some transmission solutions, namely the <i>second Mead S Sloan Canyon 230 kV line</i> and <i>Moss Landing Las Aguilas 230 kV line reconductoring</i> , were found to have sufficient economic benefits based on the available cost estimate. However, the CAISO decided not to approve these transmission upgrades as economic-driven projects in this planning cycle. BAMx supports CAISO's proposed approach to continue investigating congestion mitigations in the subsequent planning cycles based on the new CPUC IRP resource assumptions.	This comment has been noted. The ISO will continue to monitor and assess congestions in the Path 15 and Path 26 corridors, PG&E Fresno and Greater Bay areas, and the GLW/VEA and East of Pisgah areas in the 2024-2025 planning cycle.
5D	California Community Choice Association	No comment	
5E	California Public Utilities Commission - Energy Division	No comment	
5F	California Public Utilities Commission - Public Advocates Office	<p>Cal Advocates supports CAISO's recommendation to continue studying the costs and benefits as well as the need for the proposed new 500 kilovolt (kV) line between the Lugo and Trout Canyon substations referred to as the Trout-Canyon Lugo line.^[1] CAISO put the Trout-Canyon Lugo line on-hold in the 2022-2023 TPP cycle to allow for an alternative analysis with the Mead – Adelanto Project Upgrade (MAP) Upgrade project. For reference, the MAP Upgrade has a cost estimate of \$1.5 billion^[2] and the Trout-Canyon Lugo line had an estimated cost between \$1.5 to \$2 billion in 2022, but its costs are now estimated at \$2 billion.^[3] The 2023-2024 TPP analysis determined that neither project has a benefit-to-cost ratio greater than one.^[4] However, only the MAP Upgrade project addressed congestion on Path 61 and the Lugo to Victorville 500 kV line.^[5]</p> <p>Regarding the policy need for the Trout-Canyon Lugo line project, as CAISO Vice President Neil Millar explained in the February 15, 2024 PANC monthly meeting, the results from the 2023-2024 Transmission Plan study do not support moving forward with the Trout-Canyon Lugo line as a policy project at this time. However, Vice President Millar predicts that the study</p>	<p>This comment has been noted. The ISO will continue to monitor and assess congestions in the East of Pisgah area and Path 61 corridor in the 2024-2025 planning cycle.</p> <p>Regarding the policy need for the Trout-Canyon Lugo line project, as CAISO Vice President Neil Millar explained in the February 15, 2024 PANC monthly meeting, the results from the 2023-2024 Transmission Plan study do not support moving forward with the Trout-Canyon Lugo line as a policy project at this time. However, Vice President Millar predicts that the study results for the 2024-2025</p>

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>results for the 2024-2025 TPP cycle will demonstrate a need for the Trout-Canyon Lugo project based on CPUC's final resource portfolios for study in the 2024-2025 TPP cycle.^[6]</p> <p>For this reason, Cal Advocates requests that CAISO continue to evaluate the MAP Upgrade project as an alternative to the Trout-Canyon Lugo line to meet the state's policy needs for two reasons: (1) the MAP Upgrade project can mitigate congestion on Path 61 as well as the Lugo to Victorville 500 kV line unlike the Trout-Canyon line, and (2) the MAP Upgrade project involves increasing the capacity of an existing line and is less risky than the Trout-Canyon Lugo line. In contrast, the Trout Canyon Lugo line involves establishing a new high voltage corridor and building a new high voltage line. Most new transmission corridors face opposition for aesthetic and environmental concerns from the public and, for this reason, the Trout-Canyon Lugo line is likely to have more cost increases.^{[7], [8]}</p>	<p>TPP cycle will demonstrate a need for the Trout-Canyon Lugo project based on CPUC's final resource portfolios for study in the 2024-2025 TPP cycle.</p>
5G	California Wind Energy Association	No comment	
5H	Catherine Buchanan	No comment	
5I	CEERT and LEAP	<p>CEERT and LEAP appreciate the explanation of the production cost simulation the CAISO conducted to assess the economic benefits of transmission projects that mitigate congestion and curtailment on the transmission system. It is CEERT's understanding that the CAISO economic analysis includes transmission projects that have already been identified through earlier reliability- and policy-driven studies. The purpose of the economic studies is to identify additional cost-effective transmission projects beyond those that are being recommended for reliability- or policy-driven needs.</p> <p>The CAISO's analysis shows a significant amount of congestion on the Path 15 and Path 26 sections of the grid stemming from solar generation in Southern California and the San Joaquin Valley.</p>	<p>The ISO's transmission planning economic assessment is based on the TEAM methodology (https://www.caiso.com/Documents/TransmissionEconomicAssessmentMethodology-Nov2017.pdf). The main purpose of economic assessment is to identify transmission upgrade that can create economic benefit to ISO ratepayers than the cost of the upgrade. Economic assessment results can also be used to help selecting favorite alternatives from economic perspective for reliability or policy upgrades when multiple alternatives are identified.</p> <p>The ISO studied Path 15 and Path 26 corridors congestion in the 2023-2024 TPP. There were multiple alternatives were selected to receive detailed analysis, some of which showed meaningful economic benefit to ISO ratepayers. However, the ISO decided to defer recommendation of any of these alternatives in this planning cycle for the reasons outlined in the draft TPP report Chapter 4 and</p>



No	Submitting Organization	Comment Submitted	CAISO Response																												
		<p>Transmission congestion mostly results in the curtailment of wind and solar generation on the CAISO transmission system. Increasing levels of curtailment of solar and wind generation indicate that there is a need to upgrade or expand grid infrastructure. Often when solar and wind resources are curtailed there is an increase in greenhouse gas emissions from the increased dispatch of fossil fuel generation situated at other locations of the grid. The table below highlights the renewable energy zones where curtailment is occurring at relatively high levels.</p> <p style="text-align: center;">Wind and Solar Curtailment in the Base Case Resource Portfolio</p> <table border="1"> <thead> <tr> <th>Renewable Zone</th><th>Curtailment (GWh)</th><th>Curtailment Ratio</th><th>Portion of Total Curtailment</th></tr> </thead> <tbody> <tr> <td>PG&E Greater Fresno</td><td>4,267</td><td>18.8%</td><td>22.5%</td></tr> <tr> <td>Valley Electric (Southern Nevada)</td><td>2,622</td><td>22.9%</td><td>13.8%</td></tr> <tr> <td>SCE Northern (Antelope Valley)</td><td>2,560</td><td>5.7%</td><td>13.5%</td></tr> <tr> <td>SCE North of Lugo (San Bernardino)</td><td>1,449</td><td>14.1%</td><td>7.6%</td></tr> <tr> <td>Arizona (Palo Verde)</td><td>1,355</td><td>12.1%</td><td>7.1%</td></tr> <tr> <td>Total</td><td>18,972</td><td>8.8%</td><td></td></tr> </tbody> </table> <p>The CAISO observed that congestion on the Path 15 Corridor and on the Moss Landing – Las Aguilas 230 kV line have increased significantly since the last CAISO Transmission Plan. However, the CAISO did not recommend any transmission projects in the 2023-2024 Transmission Plan based on its economic production cost modeling.</p> <p>CEERT and LEAP express our disappointment that the CAISO has not recommended economic projects that would reduce curtailment and allow for the future growth of solar and storage development in the San Joaquin Valley</p>	Renewable Zone	Curtailment (GWh)	Curtailment Ratio	Portion of Total Curtailment	PG&E Greater Fresno	4,267	18.8%	22.5%	Valley Electric (Southern Nevada)	2,622	22.9%	13.8%	SCE Northern (Antelope Valley)	2,560	5.7%	13.5%	SCE North of Lugo (San Bernardino)	1,449	14.1%	7.6%	Arizona (Palo Verde)	1,355	12.1%	7.1%	Total	18,972	8.8%		<p>Appendix G. The ISO will continue to monitor and assess congestions in these corridors or areas in the 2024-2025 planning cycle.</p>
Renewable Zone	Curtailment (GWh)	Curtailment Ratio	Portion of Total Curtailment																												
PG&E Greater Fresno	4,267	18.8%	22.5%																												
Valley Electric (Southern Nevada)	2,622	22.9%	13.8%																												
SCE Northern (Antelope Valley)	2,560	5.7%	13.5%																												
SCE North of Lugo (San Bernardino)	1,449	14.1%	7.6%																												
Arizona (Palo Verde)	1,355	12.1%	7.1%																												
Total	18,972	8.8%																													
5J	County of Humboldt	No comment																													
5K	Equinor US LLC	No comment																													
5L	Fervo Energy Company	No comment																													



No	Submitting Organization	Comment Submitted	CAISO Response
5M	Golden State Clean Energy	<p>Golden State Clean Energy, LLC (“GSCE”) supports the California ISO deferring approval of upgrades related to its economic assessment of Path 15 and the Moss Landing-Las Aguilas 230 kV line. We appreciate the robust economic assessment of Path 15 and the Moss Landing-Las Aguilas 230 kV line involving multiple upgrade alternatives to mitigate congestion on these pathways. Rather than the single reconductoring project found economic in this cycle, a more comprehensive package of transmission upgrades will be needed to fully unlock Fresno and Kern area solar and storage and ensure these resources are deliverable to the Greater Bay Area and elsewhere in the region. This more comprehensive approach will better help northern California reduce its reliance on gas-fired power plants and provide better access to low-cost renewables that can drive down the cost of wholesale power for the region’s ratepayers. We therefore agree with CAISO further assessing Path 15 and Moss Landing-Las Aguilas in the 2024-2025 transmission planning process where even more Fresno and Kern area resources will be studied and local Greater Bay Area assumptions will change.</p> <p>As part of this further analysis in the 2024-2025 transmission planning process, GSCE urges CAISO to use the sensitivity study to right size any transmission upgrades it may find needed in this area. The sensitivity study will provide important insight into longer-term Fresno and Kern area resource development and Greater Bay Area gas retirement and local reliability needs. Planning for transmission upgrades that can accommodate the region’s longer-term needs, as represented by the sensitivity study, will provide a more efficient long-term transmission investment while enabling the interconnection of new resources that can come online in the late 2020s and early 2030s. When considering the opportunity to right-size transmission upgrades based on the sensitivity study, CAISO should ensure it captures the LCR reduction benefits that the Greater Bay Area and other local areas can realize by having increased access to renewable and clean resources in the Fresno and Kern area. We also believe that CAISO could provide the CPUC with valuable</p>	<p>This comment has been noted. The ISO will continue to monitor and assess congestions in the Path 15 and Path 26 corridors, and in the PG&E Fresno and Greater Bay areas in the 2024-2025 planning cycle.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>information on the sensitivity study if CAISO considers retiring alternative gas-fired power plants that best improve the economics of the comprehensive package of transmission upgrades being studied to address Path 15 and the Moss Landing-Las Aguilas 230 kV line.</p> <p>It is important that the 2024-2025 transmission planning process help close the resource gap over the next ten years by approving transmission upgrades that balance the state's long-term needs with nearer-term resource certainty. During the April 9, 2024, stakeholder meeting to discuss this cycle's draft plan, many questions and comments noted the risk and uncertainty of the investments being proposed for the 2023-2024 Transmission Plan. In contrast to the uncertainty underlying that proposed plan, solar and battery storage has a proven track record in California, with the major limiting factor at this time being access to transmission. A transmission investment comparable to this cycle's proposed plan could enable tens of gigawatts of new solar and storage to interconnect, providing both near-term renewable energy and resource adequacy resources.</p> <p>In the 2024-2025 transmission planning process, we urge CAISO to seriously consider the policy and economic value that is provided by upgrading Path 15, lines delivering Fresno and Kern area resources to the Greater Bay Area through Moss Landing, and Path 26.</p>	
5N	LS Power	No comment	
5O	LSA	No comment	
5P	Northern California Power Agency	No comment	
5Q	Offshore Wind California	No comment	
5R	Redwood Region Partners	No comment	
5S	RWE Renewables	No comment	
5T	San Diego Gas & Electric	No comment	
5U	San Francisco Public Utilities Commission	No comment	
5V	Silicon Valley Power	No comment	
5W	Smart Wires Inc.	No comment	

No	Submitting Organization	Comment Submitted	CAISO Response
5X	Sonoma Clean Power Authority	<p><i>Move forward with mitigating NP15 congestion and renewable curtailment without waiting for the next CPUC portfolio</i></p> <p>As a Northern California LSE buying load at NP15 with solar resources in the PG&E Fresno area, SCP is concerned with the CAISO's reluctance to move forward with mitigations that can reduce congestion and curtailment with a benefit to cost ratio greater than 1.0 due to uncertainty in the impact of the forthcoming CPUC portfolio. Although the base portfolio for the 2024-25 TPP does show a reduction in PG&E Fresno solar (3.5 GW vs. 5.9 GW), the high gas-retirement sensitivity for the 2024-25 TPP shows 11.2 GW of solar by 2039. These large fluctuations are unavoidable in the current deterministic planning process, as uncertainties in cost, resource availability, and technology continue to evolve. Given the enormous importance of building infrastructure to support clean, reliable, and affordable resources for Californians the CAISO must avoid deferring action in the face of uncertainty and develop a framework for approving mitigations that aren't waiting on a subsequent PSP cycle.</p>	<p>First of all, an interim solution such as reconductoring 230 kV line still requires certain lead time to be implemented. Considering the fast evolution of resource assumption for the PG&E Fresno/Kern area in the CPUC portfolio, such interim solution could become inadequate even before it is implemented. Therefore, comprehensive and long-term transmission solutions for this area need to be further assessed based on the new CPUC portfolio with considering gas-fired generation retirement. The ISO has provided detailed explanation in the draft TPP report for why the ISO deferred recommending any transmission upgrades for approval in the PG&E Fresno area and Path 15 corridor.</p>
5Y	Southern California Edison	No comment	
5Z	Tejon Ranch Company	No comment	
5AA	Transmission Agency of Northern California	No comment	
5BB	Vineyard Offshore, LLC	No comment	
5CC	Pacific Gas & Electric	No comment	
5DD	Natural Resources Defense Council, Inc.	No comment	

6. Please provide your organization's additional comments on the Draft 2023-2024 Transmission Plan April 9, 2024 stakeholder call discussion.

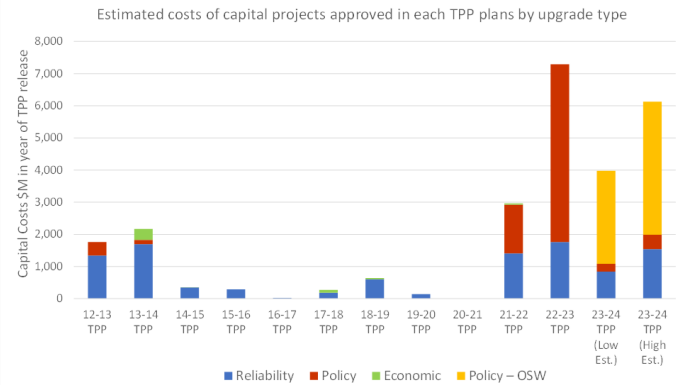
No	Submitting Organization	Comment Submitted	CAISO Response
6A	ACP-California	No comment	
6B	AES	<p>AES appreciates CAISO's consideration of Grid-Enhancing Technologies (GETs) in the transmission planning process and believes the strategic deployment of GETs can improve the grid's throughput reliably and efficiently.¹ In addition, AES concurs with CAISO that technologies like Dynamic Line Rating (DLR) and Topology Optimization (TO) can provide valuable operational benefits by unlocking additional transmission capacity. However, AES would like to emphasize that these technologies would be safer and more straightforward to utilize in operations if they were comprehensively analyzed during the planning stage.</p> <p>For example, TO would be less likely a solution in operations if a substation's busbar is not designed to accommodate alternative topologies due to factors such as the breaker scheme or short circuit ratio, or other protection related issues. As for DLR, while forecasting the line rating in the long term presents technical challenges, AES encourages CAISO to analyze and learn from real-time ambient adjusted rating (AAR) data – mandated by FERC Order 881 – to investigate the possibility of increasing the granularity of line ratings in planning and interconnection.</p>	The comment is noted.
6C	Bay Area Municipal Transmission Group (BAMx)	<p>Need to Understand the TAC Impact of the Recommended Transmission Projects Fully</p> <p>The Draft Plan does not include an estimate of future High Voltage Transmission Access Charge (HV TAC) rates at this time. The CAISO may be currently updating the "starting point" for the HV TAC estimating tool to January 1, 2024. Given the urgency of showing the TAC impact of the projects, the CAISO has recommended approval as part of the current planning cycle. BAMx developed an HV TAC forecast for the period of 2024-2037, as shown in the figure below. In this analysis, BAMx used the last version of the CAISO's TAC Estimating model developed for the 2022-2023 TPP and updated the model to</p>	The TAC impact is included in the Revised Draft.



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>include the CAISO January 01, 2024, TAC Rates (updated as of March 8, 2024). The newly added capital expenditures associated with the transmission projects and their schedule were based on the projects found to be needed in the 2023-2024 TPP as per the Draft Plan.^[1] That is, those included in</p> <ul style="list-style-type: none"> • Table 8.2-1: New Reliability Projects Found to be needed; and • Table 8.2-2: New Policy-driven Transmission Projects Found to be needed. <p>Also, note that we used only the high-voltage components for the approvals. For example, out of \$1,542 million in reliability project approvals, only \$299 million was considered for HV TAC impact, as most of the reliability projects approved are low-voltage facilities.</p>	
6D	California Community Choice Association	No comment	
6E	California Public Utilities Commission - Energy Division	<p>2022 Preferred System Plan and Base Case Portfolio</p> <p>This annual TPP assessment utilized the “2022 Preferred System Plan” (PSP) portfolios adopted by the Commission in D.23-02-040, which was designed to drive greenhouse gas emissions down to a 30 million metric ton (MMT) target in 2030. The base case portfolio, for both reliability and policy-driven purposes, was used to determine transmission investments needed for 69 gigawatts (GW) nameplate of new clean generation and storage by 2033 and 85 GW nameplate (including 24 GW of energy only resources) of new clean generation and storage by 2035.</p> <p>This base portfolio included 4.7 GW of offshore wind resources, divided between the offshore wind (OSW) lease areas off the central and north coasts. The sensitivity study conducted by the CAISO assumed a portfolio of 75 GW nameplate (including 15 GW of energy only resources) of new clean resources and</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>storage in 2035, including 13.4 GW of offshore wind resources by 2035, that was designed to update transmission capability and upgrade assumptions relevant to offshore wind for ongoing use in planning.</p> <p>The base portfolio is based on modeling to optimize clean energy resource procurement and reflects a cost-effective system plan to reach these aggressive greenhouse gas emissions targets, while ensuring reliability. Notably, the CPUC's modeling takes into account the capital costs of new resources, including any necessary new transmission infrastructure, and the variable costs of reliably operating the grid. Thus, the CAISO's analysis and the resulting identification of transmission projects needed to accommodate this rapid build-out of clean energy resources represents a cost-efficient path toward the achievement of a carbon-free CAISO grid by 2045.</p> <p>Included in this cost-effective approach is a recognition that not all of the new resources required to meet GHG goals will be 'fully deliverable'; some new resources are expected to interconnect to the grid and reduce greenhouse gas emissions even while operating as 'energy only resources' that do not directly contribute to reliability during stressed grid conditions. While the CAISO grid has not seen large volumes of energy only resources develop yet, we expect this trend to change in the coming decade.</p> <p>The CPUC's resource portfolio and the CEC's high electrification demand assumptions are the key inputs driving the transmission infrastructure that CAISO staff has identified for development within the 2023-2024 Draft Transmission Plan -- especially for the offshore wind policy-related projects. This continues a notable trend that started with the 21-22 TPP of more transmission projects that are primarily driven by state policy, as illustrated by this chart</p>	

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>Estimated costs of capital projects approved in each TPP plans by upgrade type</p>  <p>Source: CAISO data and CPUC Staff Analysis (April 2024)</p> <p>We note that for the 2023-2024 TPP cycle, the base portfolio that was analyzed was very similar to the sensitivity case that the CAISO analyzed in the 2022-2023 TPP cycle, using similar policy targets and load assumptions, and reflects the potential for increased electrification occurring in other sectors of California's economy. Thus, CAISO's previously approved upgrades in the 2022-2023 TPP adequately met the transmission needs in many locations for resources in the portfolio that was used as the base case for this 2023-2024 TPP. The Commission (in D.23-02-040) encouraged getting this kind of a "head start" on needed transmission projects wherever possible, noting the longer development lead times for major transmission projects.</p> <p>Overall, CPUC staff greatly appreciates CAISO's efforts to produce this comprehensive transmission analysis, which is extremely important for reliability while achieving the state's clean energy goals. We support this 2023-2024 Draft Transmission Plan, including the north coast transmission projects, in which the CAISO has identified the transmission buildout currently needed to reliably integrate the resource mix</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>that will keep the state on the optimal and most cost-effective pathway to meet established state goals.</p> <p style="text-align: center;"><i>Load Forecast Information Sharing</i></p> <p>During the April 9, 2024 meeting, stakeholders described difficulty both gathering information that is not a part of the original forecast and finding CEC and CAISO confirmation for load forecasts. CAISO's MarketParticipant Portal does not appear to show base cases with different load forecasts, and the only verification a stakeholder can perform is to compare the load in the base cases to the information provided by the CEC. Can the CAISO please provide documentation of its process for validating and aligning the load forecast, with a specific example of the forecast PG&E used, for evaluating proposed projects?</p> <p style="text-align: center;"><i>Previously-Approved Projects Costing Less than \$50 Million</i></p> <p>The following questions and comments are related to Table 8.1-1 of the Draft 2023-2024 Transmission Plan (Status of Previously Approved Projects Costing Less than \$50 Million):</p> <ol style="list-style-type: none"> a. 10 SCE projects had changes to their in-service dates (ISD) and now are delayed approximately one to two years, with four of these SCE projects approved within the last two TPP cycles. Not all of these project changes appeared in the CAISO's most recent Transmission Development Forum, but CPUC staff requests the CAISO or SCE provide a detailed explanation of the reasons for, and impacts of, these changes in in-service dates. b. There appears to be many projects in Table 8.1-1 that were previously identified as costing significantly more than \$50 million. Can the CAISO please confirm that the projects listed here do cost less than \$50 million, and identify if there were any errors in including projects on this Table? If this is accurate for any projects, can 	<p>Some details on each PTO's load forecasting process can be found in the TPP Study Plan. The ISO will look to expand on it in the next cycle Study Plan.</p> <p>SCE will provide this information in the next Transmission Development Forum meeting.</p>



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>CAISO please explain why the projects that previously had higher cost estimates experienced cost decreases?</p> <p style="text-align: center;">Conclusion</p> <p>It is important to reiterate how the CPUC's integrated resource planning process continually interacts with the CAISO's Transmission Planning Process to identify cost-effective ways to achieve this transition in the state's electric grid. Along with these expected large increases in transmission investments, CPUC staff anticipates intensified efforts to ensure ratepayers are getting good value. We encourage CAISO to continue to engage with PTOs to report on expected projects throughout the development time frame, and to monitor the actual vs. expected costs of new transmission.</p> <p>For example, CPUC staff looks forward to working with the CAISO and others to consider possible refinements to the methodology for estimating costs of transmission projects. We will be seeking ways and possibly new tools to minimize cost escalations, enhance the competitiveness of bidding to develop certain transmission projects and utilize timely updates on transmission limits to enhance RESOLVE capacity resource modeling. The CAISO's Transmission Development Forums have been helpful in providing information and greater public visibility on transmission project delays. We all need to work together to ensure that transmission owners are encouraged at every opportunity to reduce costs while completing the necessary upgrades. Together with the Transmission Development Forum, the CPUC's Transmission Project Review Process expands the transparency of projects to include project costs. Together, these have helped improve coordination with resource developers and provided valuable details for ratepayer advocates and other stakeholders. We hope to build on these efforts to enhance the cost-effectiveness of California's resource and transmission investment.</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
		Finally, CPUC staff supports the effort of the CAISO to implement its responsibilities in the 2022 Memorandum of Understanding (MOU) between the CAISO, California Public Utilities Commission (CPUC), and California Energy Commission (CEC) to tighten linkages among resource and transmission planning activities, interconnection processes, and resource procurement. CPUC staff requests that the Final Transmission Plan and similar documentation in future refers to the CPUC's procurement role as follows: The CPUC will provide clear direction to load-serving entities to procure to meet the state's reliability and greenhouse gas-reduction needs, and, to the appropriate extent, the information necessary for them to focus energy procurement in key transmission zones, in alignment with the transmission plan.	
6F	California Public Utilities Commission - Public Advocates Office	The 2023-2024 TPP's non-OSW related projects will have a slight impact on the High Voltage Transmission Access Charge (HV TAC) rate, which is vastly overshadowed by the impact that OSW projects will have on the HV TAC rate by 2037. Chart 1 below shows the comparison among Cal Advocate's estimated base rate, ¹¹ the rate impact from non-OSW related 2023-2024 TPP projects, and the rate impact from all 2023-2024 TPP projects. Cal Advocates estimates that the TAC rate will be \$22.88 per Megawatt hour (MWhr) by 2037. However, approximately 30% of the increase in the TAC rate by 2037 is caused by the three OSW projects and the three associated downstream mitigation projects proposed in Alternative E. Based on that increase, it will cost California ratepayers an additional \$2.54/MWhr by 2037 to incorporate OSW's transmission needs from the Humboldt call area. Cal Advocates estimates that the HV TAC rate be 96% higher in 2037 than it is currently, an increase from \$11.7/MWhr to \$22.88/MWhr. The OSW projects proposed in the TPP will continue to increase the TAC rate in 2038 and further years as depreciation of project costs accumulates beyond the initial years of capital expenditure in the mid 2030's. This increase highlights the importance of keeping transmission revenue requirement costs low and ensuring transmission projects will not result in stranded or impaired assets. Cal Advocates is encouraged to see that two	The transmission high-voltage access charge impacts has been added to the Revised Draft in section 8.6.



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>of the Alternative E projects are to be competitively bid, which can help keep costs low, especially if there is a hard cost cap on the project.</p> <p>Chart 1: 2023-2024 TPP Project Impact on HV TAC Rate</p> <p>2023 - 2024 TPP Project Impact on HV TAC Rate</p> <p>75% increase from current rate</p> <p>96% increase from current rate</p> <p>Legend:</p> <ul style="list-style-type: none"> TAC baseline incl. estimated additional capital TAC baseline incl. 2023-2024 non-offshore wind projects TAC baseline incl. all 2023-2024 TPP projects Current TAC rate 	
6G	California Wind Energy Association	Advanced conductors and other grid-enhancing technologies should be encouraged and evaluated in the competitive solicitation process to maximize carrying capacity at low incremental cost.	The CAISO considers existing system upgrades using advanced conductors and other grid-enhancing technologies when considering transmission upgrades. These types of upgrades to existing facilities are usually not eligible for competitive solicitation. However stakeholders can proposed them in the request window or in their comments.
6H	Catherine Buchanan	The underlying theme for the development of offshore wind is to be proactive to decrease the effect of human impact on climate change by reducing the use of fossil fuels that generate electricity. How can offshore wind be considered better than fossil fuels since the development of the offshore wind turbines	The resource portfolios are developed by the CPUC and provided to the ISO to assess the transmission needs.



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>and transmission lines are built with and rely on the use of fossil fuels, and the destruction of the balsa tree forests?</p> <p>In order to reduce the use of fossil fuels, why is the electricity generating infrastructure located hundreds of miles away from the end user? The offshore wind farm in Humboldt Bay is slated to deliver electricity to 1.5 million newly constructed homes in the San Francisco Bay Area. The hundreds of miles of high voltage lines are going to be made of copper with an insulating cover made of plastic or some derivative of plastic sheath, and the towers that will carry the cables will be made of steel. Please keep in mind, this is only one offshore wind farm location. There are at least 10 proposed locations, with more in the planning. Each location is estimated to have 250 turbines.</p> <p>Where is the copper going to come from that will be used for the high voltage lines? The copper is going to come from copper mining activities and the copper mines are open pit mines. The heavy equipment that is used to dig thousands of feet into the earth are larger than the double wide mobile home that is used for our office space, and I do not know of any heavy equipment that has been developed to be non-fossil fuel. The open pit that is dug thousands of feet into the earth, goes straight into the ancient groundwater that is heavily laden with salt. The salt water is much denser than freshwater, so that the freshwater is able to float on top of the salt water. The number one waste product for open pit mining activities is the pumping out of the ancient groundwater effectively removing the support structure that enabled the freshwater to float atop. There are proposals to have more open pit mines in our California forests that will dramatically increase the depth to freshwater groundwater and be out of the reach of the tree roots. The State of California has historically experienced cyclical droughts. The only way our trees have survived is because many of our trees have deep roots, greater than 70 feet deep, and were able to reach the groundwater. Now we have extremely dry forests, and no one seems to be addressing the fact that we have over 100,000 abandoned mines in the State of California that are actively</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>draining the water from our trees, or diverting the water away from infiltrating into the ground caused by the severe change in topography. The mining activities have greatly exacerbated the problems caused from a warming planet, inducing the trees to increase the evapotranspiration, reaching for the groundwater that is no longer there. The steel needed for the transmission towers to carry the cables, will the steel ore be mined or will it be recovered through an intensive recycling program? The typical habit here in the United States is once the mining company is finished, the owners declare bankruptcy and walk away from the mess, which continues to exacerbate conditions adding to climate change.</p> <p>With the thousands of miles of transmission lines over the entire build out, what is the loss of electricity on the lines? Has the efficiency been calculated with the losses included in the calculations? Are the losses 20%, 50% 80% of the generated electricity from the turbines?</p> <p>And speaking of losses, as the winds increase in strength, the turbines cannot be active in high winds. How much down time will the turbines experience to avoid the turbines from exploding over the ocean? How will this affect the transmission lines when the turbine falls into the ocean? How will clean-up activities be conducted to minimize the diesel fuel from spilling into the ocean?</p> <p>From what chemicals will the protective sheaths be made that will encase the copper lines that will carry the high voltage? The current materials are made from petrochemicals, which are produced from crude oil refining, which is still fossil fuel usage. What is the production needed from fossil fuels to produce the protective cover of the high voltage copper lines? With the push to go fossil fuel free, why are there new leases for offshore oil platforms in the Gulf of Mexico?</p> <p>The blades of the turbines are lined with balsa wood from the Amazon rainforest.</p>	



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>(https://stopthesethings.com/2021/12/18/billions-of-wind-turbine-blades-built-with-balsa-wood-stripped-from-amazons-forests/).</p> <p>The contradiction of using offshore wind to combat climate change while simultaneously gutting the rainforest of its mature trees that are essential for taking in carbon dioxide that is one of the greenhouse gases that pushes climate change is incomprehensible.</p> <p>As the cables are pulled over the California mountains, how many mature trees will be cut down to make room for the steel towers and the roads required for maintenance and repairs? Removing mature trees reduces the ability to remove carbon dioxide from the atmosphere, which is contrary to combating climate change.</p> <p>Requesting sensitive information from Tribes regarding their sacred sites is also incomprehensible because there is no guarantee for the safety of the information to prevent theft of the sacred sites. Cultural monitors are needed on-site. Appropriate actions need to be taken to ensure sacred sites are not disturbed, and that entails proper consultation prior to and during earth moving activities.</p> <p>There is still no talk of the EMF that the high voltage transmission lines will create when they are suspended in salt water over the entire west coast that will greatly affect the aquatic life that can detect a 0.000000001 volt</p> <p>I fail to understand how locating the electricity generation hundreds of miles away from any new development is the best method for reducing greenhouse gases. All of the activities that are required to produce the turbines, high voltage cables, and steel towers will add to the problems of climate change. Decentralization of the electricity generation to be built close and/or within the boundaries of the new development will significantly reduce the requirement for thousands of miles of copper cable, plastic sheath, and steel towers. Diversification of</p>	



No	Submitting Organization	Comment Submitted	CAISO Response																																												
		electricity generation is what is needed that is located near the development. Offshore wind is not the answer.																																													
61	CEERT and LEAP	<p>The overwhelming majority of projects in the Cluster 15 queue are either standalone batteries or batteries paired with solar generation. The following table shows the number of interconnection requests and the requested capacity by each of the transmission zones in the CAISO system.</p> <p>Cluster 15 Interconnection Requests by Transmission Zone</p> <table border="1"> <thead> <tr> <th>Transmission Zone</th><th>Total Interconnection Requests</th><th>Megawatts Requested at the Point of Interconnection</th><th>Interconnection Requests for Standalone Battery Systems</th></tr> </thead> <tbody> <tr> <td>SCE Northern (Tehachapi and Ventura)</td><td>38</td><td>20,688</td><td>22</td></tr> <tr> <td>SCE Eastern (Riverside and Arizona)</td><td>34</td><td>19,312</td><td>16</td></tr> <tr> <td>East of Pisgah (San Bernardino and Nevada)</td><td>45</td><td>23,235</td><td>16</td></tr> <tr> <td>Greater Fresno Area</td><td>117</td><td>51,751</td><td>44</td></tr> <tr> <td>Greater Bay Area</td><td>54</td><td>16,686</td><td>40</td></tr> <tr> <td>Kern (Excluding Tehachapi)</td><td>34</td><td>7,664</td><td>17</td></tr> <tr> <td>Los Angeles Metro</td><td>23</td><td>9,770</td><td>23</td></tr> <tr> <td>North Bay Area (Central Valley and Coast)</td><td>59</td><td>14,836</td><td>32</td></tr> <tr> <td>North of Lugo (San Bernardino and Inyo)</td><td>50</td><td>19,703</td><td>27</td></tr> <tr> <td>SDG&E/Imperial Valley</td><td>53</td><td>18,625</td><td>31</td></tr> </tbody> </table> <p>It can be seen from this table that the quantities of interconnection requests within each transmission zone are very robust. The interconnection process reform proposes ranking the projects within each transmission zone. Reform of the interconnection process is clearly needed so that meaningful interconnection studies can be initiated for Cluster 15 in 2025.</p> <p>A very large number of interconnection requests for renewable energy projects are located in the Greater Fresno</p>	Transmission Zone	Total Interconnection Requests	Megawatts Requested at the Point of Interconnection	Interconnection Requests for Standalone Battery Systems	SCE Northern (Tehachapi and Ventura)	38	20,688	22	SCE Eastern (Riverside and Arizona)	34	19,312	16	East of Pisgah (San Bernardino and Nevada)	45	23,235	16	Greater Fresno Area	117	51,751	44	Greater Bay Area	54	16,686	40	Kern (Excluding Tehachapi)	34	7,664	17	Los Angeles Metro	23	9,770	23	North Bay Area (Central Valley and Coast)	59	14,836	32	North of Lugo (San Bernardino and Inyo)	50	19,703	27	SDG&E/Imperial Valley	53	18,625	31	The comment has been noted.
Transmission Zone	Total Interconnection Requests	Megawatts Requested at the Point of Interconnection	Interconnection Requests for Standalone Battery Systems																																												
SCE Northern (Tehachapi and Ventura)	38	20,688	22																																												
SCE Eastern (Riverside and Arizona)	34	19,312	16																																												
East of Pisgah (San Bernardino and Nevada)	45	23,235	16																																												
Greater Fresno Area	117	51,751	44																																												
Greater Bay Area	54	16,686	40																																												
Kern (Excluding Tehachapi)	34	7,664	17																																												
Los Angeles Metro	23	9,770	23																																												
North Bay Area (Central Valley and Coast)	59	14,836	32																																												
North of Lugo (San Bernardino and Inyo)	50	19,703	27																																												
SDG&E/Imperial Valley	53	18,625	31																																												



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>Area. In fact, the proposed project capacity at points of interconnection within the Greater Fresno Area exceeds the resource capacity assigned to the area by more than five-fold. There are 16 projects that are seeking to interconnect at 500 kV at major Path 15 substations. In addition there are another 101 projects seeking interconnection at lower voltage levels in the San Joaquin Valley.</p> <p>While there are advantages to geographic diversity for solar generation that includes projects it should not be forgotten that there are economic and community benefits associated with a 10 to 20 year project development pipeline. CEERT and LEAP urge energy policymakers to prioritize development of solar, storage and new transmission in the San Joaquin Valley.</p> <p>A core objective of transmission planning in coordination with interconnection process reform and procurement is to keep the State on track to meet its policy commitment to decarbonize the economy. It is also important that the investments that need to be made benefits underserved areas of the state like the San Joaquin Valley. We appreciate the CAISO taken this recommendation into consideration as it furthers transmission planning processes.</p>	
6J	County of Humboldt	<p>CAISO Should Reassess Transmission Developer Selection Criteria</p> <p>To ensure equity in transmission development, we recommend that developer selection criteria prioritize bidders that have a proven history of, or include a detailed development plan that includes:</p> <ul style="list-style-type: none"> Engaging in good faith negotiations with local governments, communities and Tribal Nations to develop community benefits and mitigation agreements. Prioritizing local workforce development throughout all stages of the project. Outlining and committing to a local hiring plan and targeted hiring goals for local residents, members of 	The comment has been noted.



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>Tribal Nations, women, people of color, and other under-represented groups.</p> <ul style="list-style-type: none"> • Outlining a plan to ensure maximum tax revenues, including but not limited to sales and property tax, will be returned to local communities. • Resolving to work in close collaboration and partnership with local Tribal Nations to protect and preserve environmental and culturally sensitive areas. • Co-designing transmission infrastructure siting for avoidance of or mitigation of impacts, and building local capacity to take part in the project. • Resolving to work in close collaboration with local governments to coordinate planning and build out efforts and incorporate local needs and interests. <p>This will grant communities a clear pathway to engage in the routing, siting, and planning of potential transmission projects.</p> <p>Thank you for the opportunity to provide our comment. We look forward to working with CAISO and other interested stakeholders throughout the bidding process and exploration of 2024-2025 transmission planning process.</p>	
6K	Equinor US LLC	<p>Equinor appreciates this opportunity to engage in the Draft TPP stakeholder discussion. During the call, questions and comments were brought up regarding the Morro Bay 500 kV substation and an underlying presumption that each of the three offshore wind developers intend to interconnect their projects at the Diablo Canyon substation. Given the early stage of development the Offshore projects are in currently, Equinor suggests that the assumptions for interconnecting at Diablo Canyon need revision for multiple reasons:</p> <ol style="list-style-type: none"> 1. The technical and environmental challenges at Diablo Canyon make landfall and the installation of export cables particularly difficult. 2. The rugged terrain around Diablo Canyon limits the availability of flat land necessary for the expansion of both the existing 	The comment has been noted

No	Submitting Organization	Comment Submitted	CAISO Response
		<p>Diablo Canyon substation and any new project-specific substations.</p> <p>3. If the Diablo Canyon nuclear plant remains operational past 2030, the required substation expansion would need to be significantly larger, leading to substantially increased costs.</p> <p>4. Any delays in upgrading the transmission infrastructure, would limit offshore wind deliverability, which would significantly affect project timelines due to the compounding effects resulting from offshore wind and transmission both being long lead time infrastructure projects.</p> <p>Considering these limitations and complications, Equinor recommends that the next TPP should instead consider the nearest viable alternative to Diablo Canyon, which is Morro Bay. Analyzing this alternative would yield beneficial insights on what transmission projects could potentially be required to achieve deliverability for offshore wind projects interconnected at Morro Bay.</p>	
6L	Fervo Energy Company	No comment	
6M	Golden State Clean Energy	No comment	
6N	LS Power	No comment	
6O	LSA	No comment	
6P	Northern California Power Agency	No comment	
6Q	Offshore Wind California	No comment	
6R	Redwood Region Partners	No comment	
6S	RWE Renewables	No comment	
6T	San Diego Gas & Electric	No comment	
6U	San Francisco Public Utilities Commission	No comment	
6V	Silicon Valley Power	No comment	
6W	Smart Wires Inc.	No comment	
6X	Sonoma Clean Power Authority	SCP appreciates CAISO's responsiveness to prior feedback that the TPP process should include detailed documentation on the scope of policy-driven MIC expansion. Table 6.1-5 in the Draft	Thank you for your support.



No	Submitting Organization	Comment Submitted	CAISO Response
		<p>TPP is very useful in calibrating the magnitude and location of expanded import capacity. To provide additional clarity on the risk and process for expanding import capacity to support state policy, SCP asks the following questions:</p> <ol style="list-style-type: none"> 1. What is the risk of policy-driven MIC in Table 6.1-5 failing the GIP study? What is the timing for the GIP for policy-driven projects and if they fail, will projects to alleviate constraints identified in GIP be considered in a subsequent TPP? 2. Is the ISO considering reserving TPD associated with policy-driven MIC expansion (similar to offshore wind), particularly for unique resources like out-of-state geothermal and wind? 3. Is the comment in the TPP that "the ISO confirms that not all import branch groups or sum of branch groups have enough MIC to achieve deliverability for all external renewable resources... in 2033" (page 131) specific to the SUMMIT intertie in Table 6.1-6 or is that a broader statement that there are MIC needs not in the tables or in 6.1-5 that the ISO sees as not sufficient? 4. Harry Allen has no existing MIC but the planned MIC expansion will make it a viable import point in the future (subject to GIP). Is this interpretation of the table correct? 5. Is there coordination with the CPUC to use the results from 6.1-5 to inform the busbar mapping for future portfolios? Note: ultimately, the remapping is something that needs to be fed back to LSEs and developers so that they can't start securing the TSRs to get these resources to the spots with planned capacity. SCP supports incorporating policy-driven MIC in the future outlook—is this something that will happen after the GIP? 	<p>If a policy-driven MIC required expansion fails the GIP deliverability study then new transmission solutions need to be proposed and approved in the next TPP cycle as described in Reliability Requirements BPM section 6.1.3.6.</p> <p>This is a point for future consideration.</p> <p>It refers to the Summit intertie, the only one that currently is behind a constraint without an approved TPP solution.</p> <p>The interpretation is correct. Also, Harry Allen is a catch all proxy intertie for Wyoming and Idaho wind, given currently there are no other scheduling points available from those wind areas.</p> <p>CAISO coordinates bus-bar mapping with the CPUC and will continue to do so.</p> <p>This section of the TPP report will be updated every year with the last information resulting from the NQC, TPP and GIP deliverability studies.</p>

No	Submitting Organization	Comment Submitted	CAISO Response															
6Y	Southern California Edison	<p>1. Section 8.3 Grid-Enhancing Technologies (GETs), on pg. 159</p> <p>SCE requests the following revisions to “Table 8.3-1: Flow Control, Advanced Conductor and Dynamic Reactive Support Approved Projects” as described below.</p> <p>In-service Date (ISD) Revisions:</p> <ul style="list-style-type: none">• Big Creek Rating Increase Project – Revised ISD 2020 <p>Projects to add that were approved in prior transmission planning cycles and include application and deployment of advanced conductors:</p> <ul style="list-style-type: none">• Moorpark-Pardee No. 4 230 kV Line – TP Approved Year and ISD• Laguna Bell-Mesa No. 1 230 kV Line Rating Increase Project – TP Approved Year and ISD• San Bernardino-Vista 230 kV 1 Line Upgrade – TP Approved Year and ISD• San Bernardino-Etiwanda 230 kV 1 Line Upgrade – TP Approved Year and ISD <table><tr><th>Projects</th><th>Transmission Plan approved</th><th>In service Date (planned or achieved)</th></tr><tr><td>Advanced Conductors</td><td></td><td></td></tr><tr><td>Big Creek Rating Increase Project</td><td>2016-2017</td><td>2020</td></tr><tr><td>Moorpark-Pardee No. 4 230 kV Line</td><td>2017-2018</td><td>2022</td></tr><tr><td>Reconductor Lugo-Victor 230 kV No. 1, 2, 3 & 4 lines</td><td>2022-2023</td><td>2032</td></tr></table>	Projects	Transmission Plan approved	In service Date (planned or achieved)	Advanced Conductors			Big Creek Rating Increase Project	2016-2017	2020	Moorpark-Pardee No. 4 230 kV Line	2017-2018	2022	Reconductor Lugo-Victor 230 kV No. 1, 2, 3 & 4 lines	2022-2023	2032	The Revised Draft has been updated to include.
Projects	Transmission Plan approved	In service Date (planned or achieved)																
Advanced Conductors																		
Big Creek Rating Increase Project	2016-2017	2020																
Moorpark-Pardee No. 4 230 kV Line	2017-2018	2022																
Reconductor Lugo-Victor 230 kV No. 1, 2, 3 & 4 lines	2022-2023	2032																



No	Submitting Organization	Comment Submitted			CAISO Response
		Laguna Bell - Mesa No. 1 230 kV Line Rating Increase Project	2021-2022	2024	
		San Bernardino-Vista 230 kV 1 Line Upgrade	2022-2023	2028	
		San Bernardino-Etiwanda 230 kV 1 Line Upgrade	2022-2023	2031	
6Z	Tejon Ranch Company	No comment			
6AA	Transmission Agency of Northern California	<p>TANC appreciates the CAISO's draft iteration of the 2023-2024 TPP, including initial studies and plans for integrating the planned Humboldt off-shore wind resources into the CAISO system.</p> <p>TANC acknowledges the preliminarily indicated impacts to various segments of TANC's primary asset, the 500kV California-Oregon Transmission Project (COTP), a key piece of infrastructure to the California-Oregon Intertie, the California bulk grid, and the Western regional bulk grid.</p> <p>TANC requests continued transparency and collaboration on identifying and mitigating those impacts to the COTP, the COI, and the greater Northern California 500kV system.</p> <p>Additionally, has the CAISO considered the possibility of utilizing COTP facilities and/or ROWs to integrate off-shore wind generation? For example, using the Olinda substation as a potential point to inject Humboldt and the greater North Coast regional off-shore wind resources into the 500kV system for eventual distribution to Central Valley, Northern California, and/or Greater Bay Area load centers? If so, does the CAISO plan on including an analysis as part of the current or future TPP cycles or in another proceeding?</p>			<p>The comment has been noted.</p> <p>The interconnection of the offshore wind resources have been interconnected to the CAISO controlled grid in these assessments to reflect the needs identified in the CPUC portfolios.</p>
6BB	Vineyard Offshore, LLC	No comment			
6CC	Pacific Gas & Electric	No comment			
6DD	Natural Resources Defense Council, Inc.	No comment			

