SB 1174: 2025 Transmission System Assessment

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Integrated Resource Planning – Transmission & Interconnection section

Energy Division

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California Public Utilities Commission

SB 1174 (Hertzberg, 2022)

Required Legislative Report

- Incorporated into 2025 Annual RPS Report to the Legislature.
- *SB 1174 requires… "a report on any changes to previously reported in-service dates of transmission and interconnection facilities necessary to provide transmission deliverability to eligible renewable energy resources or energy storage resources that have executed interconnection agreements, and to identify the reason for any changes to the status of in-service dates."*

Motivation

- Concerns about interconnection delays of clean energy projects raised by multiple stakeholders.
- Staff analysis to understand & address interconnection and transmission project delays through the TED Task Force, CAISO's Transmission Development Forum, Transmission Project Review Process (TPR), and other initiatives.

SB 1174 Analysis

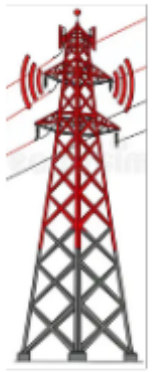
Analysis Objectives

- Identify capacity of generation and storage resources delayed or "at risk" of becoming delayed due to delayed transmission projects that these resources depend on.
- Identify specific transmission projects holding up the largest number of gigawatts (GW) of resources.
- Understand the median delay time for each delay reason.

Uses

- Identify reasons for transmission delays that have the highest impact on generation and storage resources, and that are associated with the largest changes to in-service dates.
- Help CPUC, TED Task Force, developers, utilities, and the legislature to focus their attention on specific projects, and general areas for process improvements.

Explaining Delayed, At Risk, Not Delayed Resources



Day 1 (Original ISD)

Day 100 (Planned ISD)

Transmission Project Delay

Day 1 **Estimated Median Delay** (150 days)

Day 150

Delayed
(since resource ISD is before planned transmission ISD)

At Risk
(since resource ISD is after planned transmission ISD but within median delay time)

Not Delayed
(since resource ISD is beyond planned transmission ISD and median delay time)

Day 70 (Planned ISD)

Day 120 (Planned ISD)

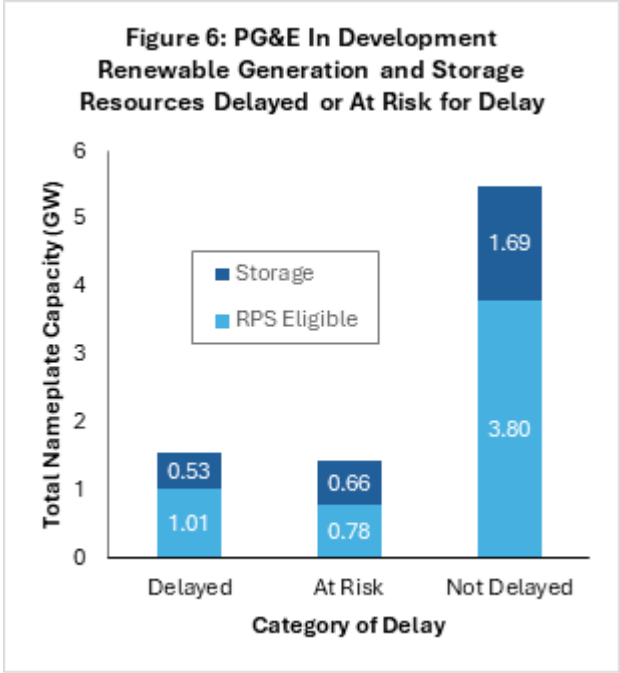
Day 170 (Planned ISD)

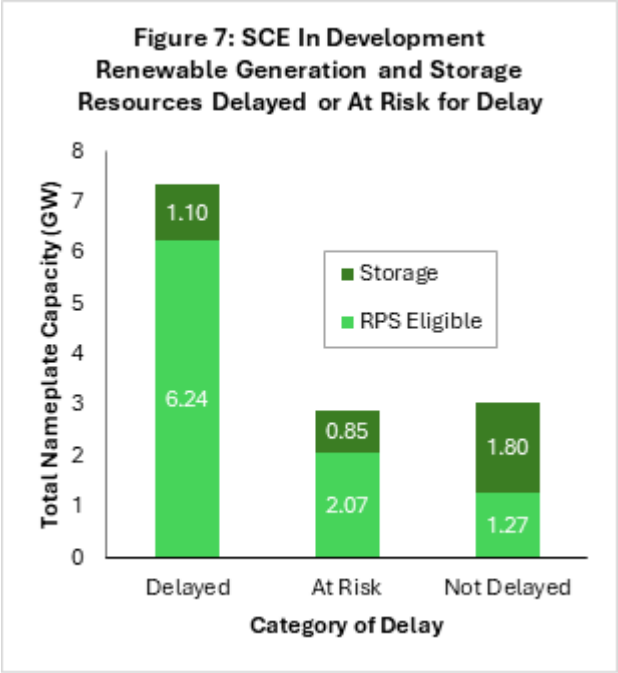
Generation/Storage Resources Dependent on Transmission Project

ISD = In-Service Date for a transmission project or energy/storage resource

Total Resources Impacted By Delayed Tx Projects

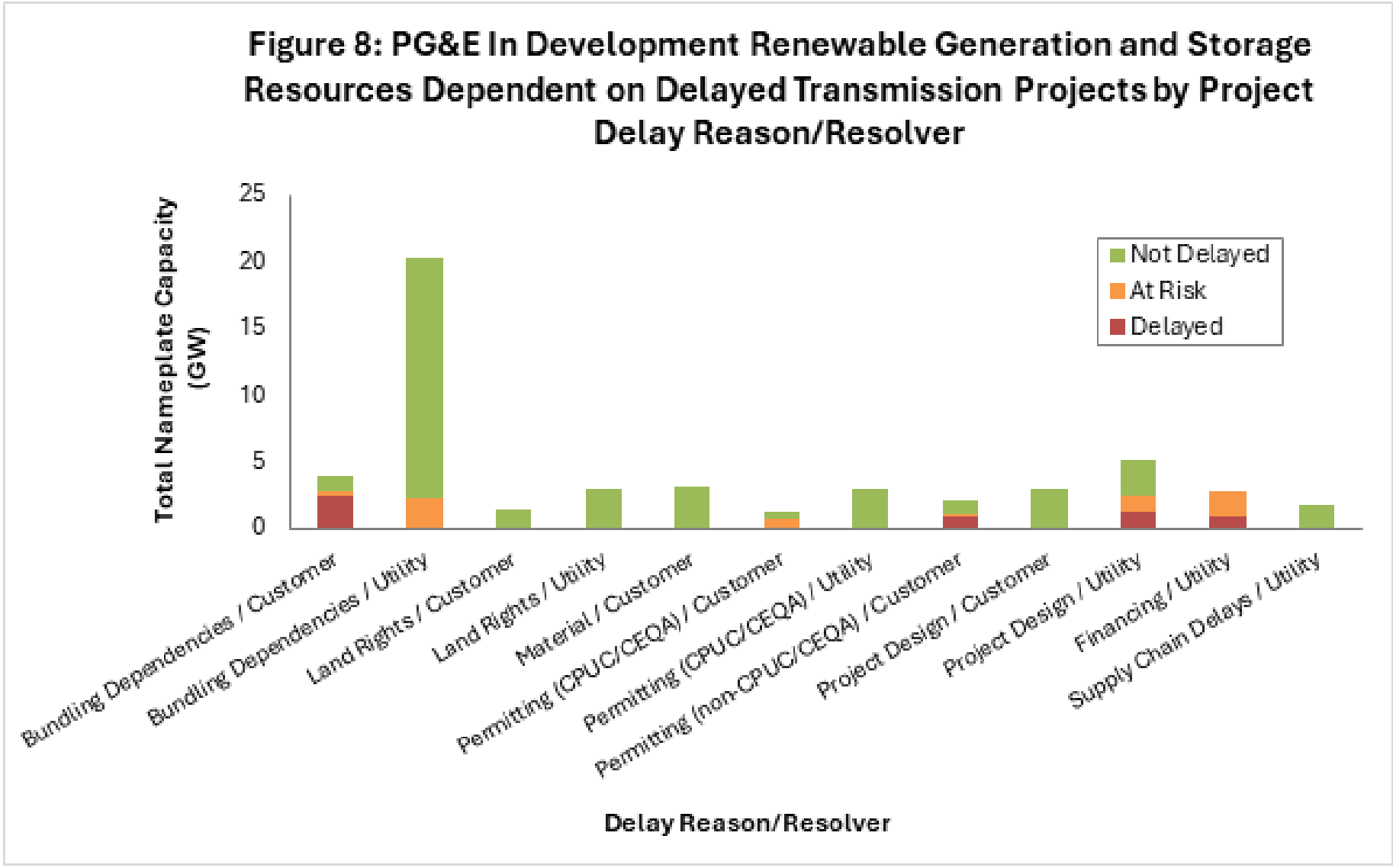
- There are approximately 40.5 GW of new renewable generation and storage resources with signed interconnection agreements in SCE and PG&E areas, and about 8.9 GW (~22%) of those resources are expected to be delayed due to transmission delays.
- SDG&E reported no delayed transmission projects and wasn't included in this analysis.





Transmission Owner	Total Generation & Storage Resources (GW)	Resources Dependent On Delayed Tx (GW)	Resources Dependent On Delayed Tx (%)	Resources Delayed (GW)	Resources Delayed (%)	Resources "At Risk" (GW)	Resources "At Risk" (%)
PG&E	16.2	8.5	52.2 %	1.5	9.5 %	1.4	8.9 %
SCE	24.3	13.3	54.9 %	7.3	30.3%	2.9	12.0 %
Total	40.5	21.8	53.9 %	8.9	21.9 %	4.4	10.8 %

PG&E Quantity Of Resources Delayed For Each Reason

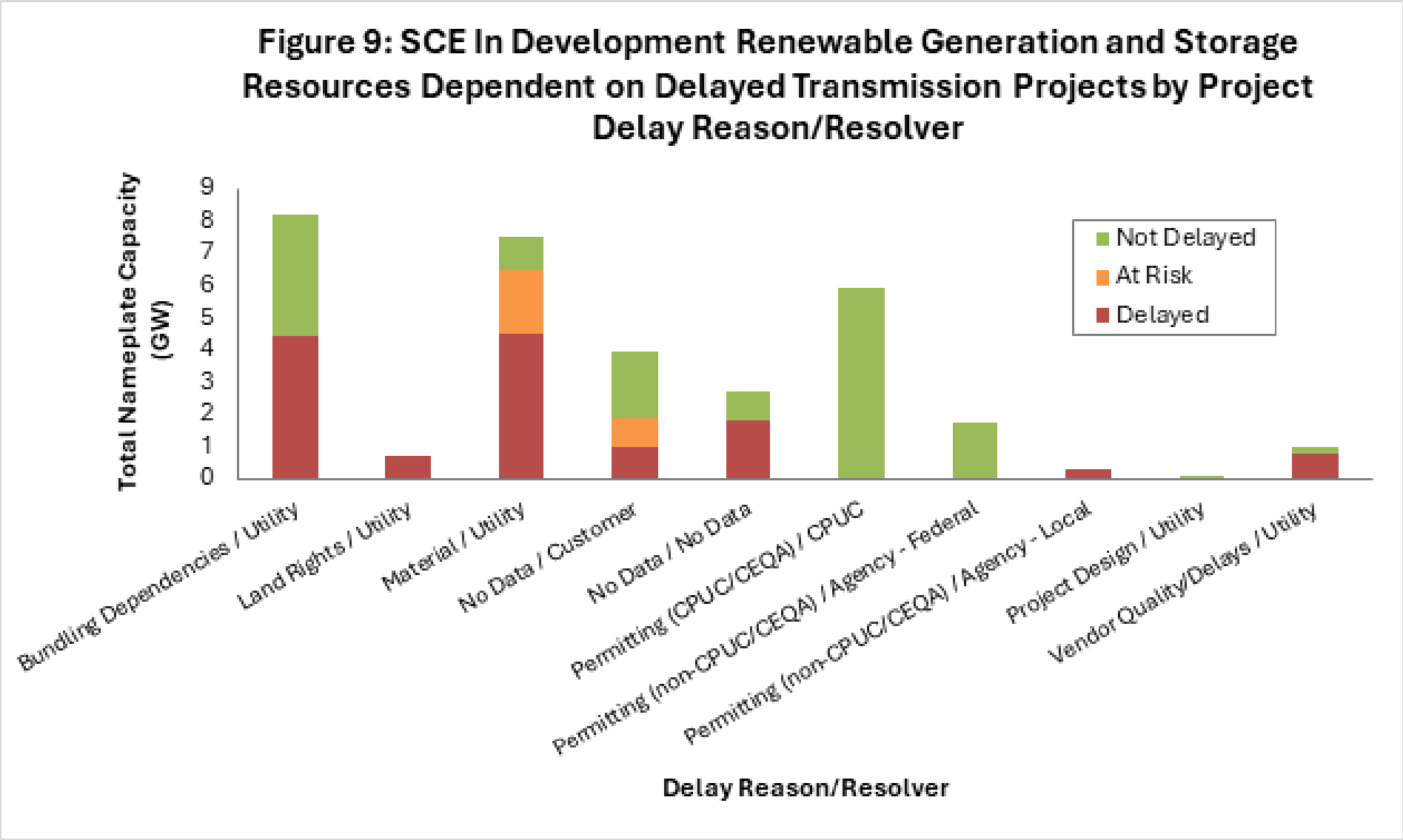


- *Note: These plots count generators impacted by multiple Tx projects multiple times, showing the relative impact of each delay reason.*

PG&E Key Delay Reasons

- For PG&E, 2.5 GW of in-development renewable generation and storage resources are expected to be delayed due to "bundling dependencies" (chain reactions of transmission project delays). PG&E fully attributed its interconnection customers as the "delay resolvers" for these transmission project delays.
- Financing and project design/redesign delays are also expected to have significant impacts on in-development resources.

SCE Quantity Of Resources Delayed For Each Reason



- *Note: These plots count generators impacted by multiple Tx projects multiple times, showing the relative impact of each delay reason.*

SCE Key Delay Reasons

- For SCE, transmission project delays due to "materials" are expected to delay the interconnection of 4.5 GW of in-development resources, and put an additional 2 GW of resources "at risk" of delay. Materials delays are related to the procurement of long lead-time materials like circuit breakers, transformers, and specialized steel structures.
- Bundling dependencies were associated with the second most delayed and at-risk resources at 4.4 GW. For these transmission project delays SCE attributed itself as the delay resolver.
- Nearly 3.7 GW of in-development resources are associated with delayed transmission projects where "no data" was given as the reason for delay. For just over half (51%) of these 3.7 GW, SCE claims that delays are customer initiated, and SCE does not necessarily know the reason for the delay.

PG&E High Impact Transmission Projects

High impact projects identified by CPUC Energy Division staff:

Table 11: PG&E High Impact Transmission Projects		
PG&E Transmission Project	Total Capacity Delayed (MW)	Total Capacity At Risk (MW)
Vaca Dixon Substation 230 kV Circuit Breakers 442, 452 and 462 overstress	450	900
Q1496 Descendant Ranch (multiple upgrades)	500	0
BORDEN-GREGG upgrades	232	0

Other high impact projects identified by PG&E:

- **Conversion of Midway Substation 230 kilovolt (kV) Bus D to Breaker-and-a-Half:** PG&E states that this project has experienced bundling dependency delays, with the potential to impact **15.95 GW** of resources. Many of these dependent resources do not yet have interconnection agreements and aren't represented in the SB 1174 data. On mitigation PG&E states that "To address the delay, construction sequencing and buying equipment earlier will curtail the long-term delays and construction impacts."

- **The Gates 230 kV Reactors Bus E-F (Reliability Network Upgrade 1596):** PG&E states that "The primary delay was due to the supply chain triggering an 11 months behind with an impact of 2 GW." To address the delays PG&E will be shifting material from another project.

SCE High Impact Transmission Projects

High impact projects identified by CPUC Energy Division staff:

Table 12: SCE High Impact Transmission Projects		
SCE Transmission Project	Total Dependent Delayed (MW)	Total Dependent At-Risk (MW)
Lugo-Victorville 500 kV Transmission Line Upgrade	2,567	0
Devers-Valley No.1 500 kV Line Upgrade	2,300	0
San Bernardino-Vista 230 kV 1 Line Upgrade	1,400	0
Mesa - Mira Loma 500 kV UG Third Cable	1,400	0
Lugo-Victorville Centralized RAS	1,070	0
ED&P scope of work for 500kV Gen-Tie TOT905/Q1647 Angora Solar Farm	700	0
Gracesol Substation: Colorado River Substation-(IRNU-Shared) - TOT1006 (Q1761) Grace Energy Center	500	0

Other high impact projects identified by SCE:

- **Eldorado-Lugo-Mohave RPS upgrade:** SCE lists "Permitting (CPUC/CEQA)" as the reason for delay for this upgrade, but this project experienced significant delays associated with completion of the NEPA document by the BLM and National Park Service. There was also an amended application during the permitting process. CPUC prepared a Mitigated Negative Declaration for the project timed to sync up CPUC's CEQA process with the NEPA process.

Recommendations

- PTOs should consider allocating more time/resources in the early transmission project planning phase to determine more realistic ISDs and project costs. As part of its Order 1920 compliance filing, CAISO proposed a reassessment of the sequencing of its existing transmission planning process which may give PTOs a longer window to study new transmission projects. Better estimations of transmission project timelines may alleviate chain reactions of project delays ("bundling dependencies").
- PTOs should continue to engage in proactive procurement of long lead-time materials, and evolve their procurement strategies.
- CPUC staff and PTOs should continue to consider additional ways to more effectively obtain better data on the permitting timelines of each transmission project (such as what is underway with the new CPUC General Order 131-E pilot program).
- Transmission owners, CAISO, CPUC, and other state agencies should work closely to develop consistent metrics that identify "high impact" transmission projects whose delays pose a high risk to system or local reliability.

Next Steps

- Highlight key issues through 2026 Transmission Development Forum. These issues can also be highlighted in other forums on accelerating transmission and interconnection (like IEPR).
- Can raise during 2026 state agency workshops on accelerating interconnection.
- SB 1174 assessment can be used as a reference by state agencies and transmission owners to help direct their efforts.

Appendix: PTO Delay Mitigation Efforts

PG&E Delay Mitigation Efforts (July 2024 – July 2025)

- PG&E identified "Customer" as the delay resolver in 49 percent of delayed projects and states that it supports interconnection customers with: pre-submission permitting/environmental review, customer design package review, utility and telco coordination dependencies and issues, and clearance sequencing.
- PG&E stated that it has freed up investment capital to advance project funding to allow earlier procurements to combat long lead-times. These mitigation efforts address "Material" delays, which PG&E identified as a delay reason for 3 percent of its delayed transmission projects.
- While not described as a primary delay reason for any transmission projects, PG&E recognized workforce availability as a contributing factor to delays and stated that it has implemented "proactive measures" to optimize available labor resources.

SCE Delay Mitigation Efforts (July 2024 – July 2025)

- To address materials delays, SCE has executed a sourcing plan using a 5-year forecast and negotiated contracts with manufacturers to reserve production slots for power transformers and circuit breakers. SCE plans to have enough circuit breakers in the ordering cycle to reduce the waiting time for customer generator interconnection by half.
- In 2024 SCE successfully hired six additional technical professionals across key disciplines, including protection engineering, protection testing, and grid controls. SCE noted that delays are more closely tied to timing and sequencing of tasks, rather than workforce shortages.
- Reviewed its Centralized Remedial Action Scheme (CRAS) process and reduced the overall schedule from 36 months to 30-33 months, and improved overall workflow efficiency.
- Identified customer-driven milestones which has improved communication and increased certainty of project scope.
- SCE submitted its FERC Order No. 2023 compliance filing in August 2024, and new Wholesale Distribution Access Tariff (WDAT) requirements for QC15 projects. SCE stated that "these changes will allow SCE to streamline resource allocation, enhance scheduling accuracy, and allow for more focused and efficient execution of interconnection studies and stakeholder coordination".
- SCE worked with customers by helping them to understand requirements through an updated interconnection handbook, proactively ordering common circuit breakers, and establishing most effective interconnection points.
- To address transmission and interconnection delays to in-service dates in 2025, SCE has reorganized teams responsible for initiating generator interconnection agreements and managing contracts after execution, eliminating multiple touch points and hand-offs.
- Continues to actively enhance its Grid Interconnection Processing Tool to improve data quality and tracking for both CAISO and WDAT Interconnection Requests.