CLEAN AIR TASK FORCE

Transmission Development in California – What's the Slowdown?

January 2023

Introduction

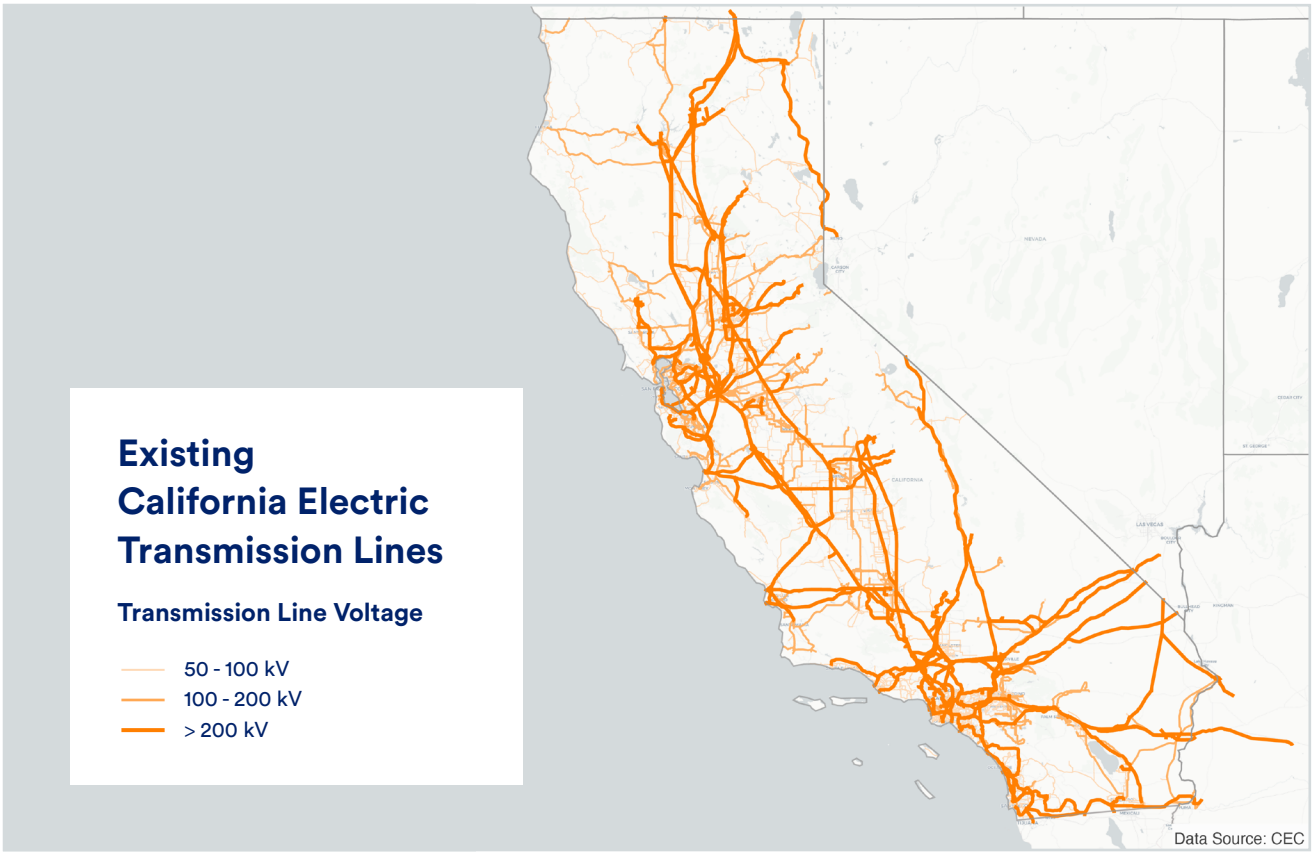
The electricity transmission system – the backbone of the power system – is the key to clean, cost-effective, and reliable electricity delivery to Californians. New high-voltage cables, enhanced existing cable networks, and supporting infrastructure connect electricity generating resources to local distribution networks where energy is most needed. A modern transmission network also facilitates import of low-cost electricity from other states, supplementing electricity supply and easing energy burdens for California communities. Increasingly ambitious climate and energy laws in California, coupled with decreasing clean energy technology costs, drive the development of new, decarbonized resources which require a robust transmission network to bring energy to demand centers.

A recent report by Clean Air Task Force (CATF) and Environmental Defense Fund (EDF), *Growing the Grid: A Plan to Accelerate California's Clean Energy Transition*, demonstrates that delivering on California's climate goals will require a significant upgrade and expansion of the state's transmission network.[1] While the enormity of the investment challenge that lies ahead is becoming increasingly understood, key factors contributing to significant cost overruns and delays in transmission development are less clear. In this report CATF explains the California transmission development process and identifies opportunities to accelerate permitting, manage ratepayer impacts, and proactively develop transmission so vitally needed to reach the state's clean energy goals.

100% of California's retail electricity needs are required to be supplied with **renewable and zero-carbon resources by 2045**

$30B in new transmission is needed over the next two decades to **meet these targets**

[1] Clean Air Task Force (CATF) and Environmental Defense Fund (EDF), "Growing the Grid: A Plan to Accelerate California's Clean Energy Transition", October 2022. https://www.catf.us/resource/growing-grid-plan-accelerate-californias-clean-energy-transition/



In 2018 California passed Senate Bill 100 requiring 100% of the state's retail electricity needs be supplied with renewable and zero-carbon resources by 2045. **Meeting this goal will require an unprecedented build out of new clean energy generation accompanied by similarly unprecedented new transmission capacity build.** In its first 20-Year Transmission Outlook published in 2022, the California Independent System Operator (CAISO) projected more than $30 billion in new transmission need over the next two decades to meet these targets. While CAISO's 2020-2021 plan forecasted an additional 1,000 MW of renewable energy capacity per year over the next decade, its 2022-2023 draft plan projects 4,000 MW of capacity added annually, signifying accelerated growth projections and highlighting the criticality of efficient and rapid deployment.[2]

Today, the transmission development process is lengthy and complex, frequently requiring a decade or more per major project and ongoing coordination between CAISO, the California Public Utilities Commission (CPUC), and utilities to plan, permit, and construct projects. Long timelines and crippling delays continue to challenge current and future build rates.

CAISO's most recent Transmission Plan for 2021-2022 illustrates the extent of current delays. Ongoing projects approved before this plan with anticipated costs exceeding $50 million have accrued, on average, more than five years of delay. The length of delays often exceeds the original estimated project duration. For the fourteen projects past their original in-service date, delays average three times the projects' anticipated duration. Without revisions to current planning and permitting processes, it will be tremendously difficult for California to connect new generation to the grid in time to meet its clean energy and climate goals.

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[2] California Independent System Operator (CAISO), "20-Year Transmission Outlook", May 2022. http://www.caiso.com/InitiativeDocuments/20-YearTransmissionOutlook-May2022.pdf

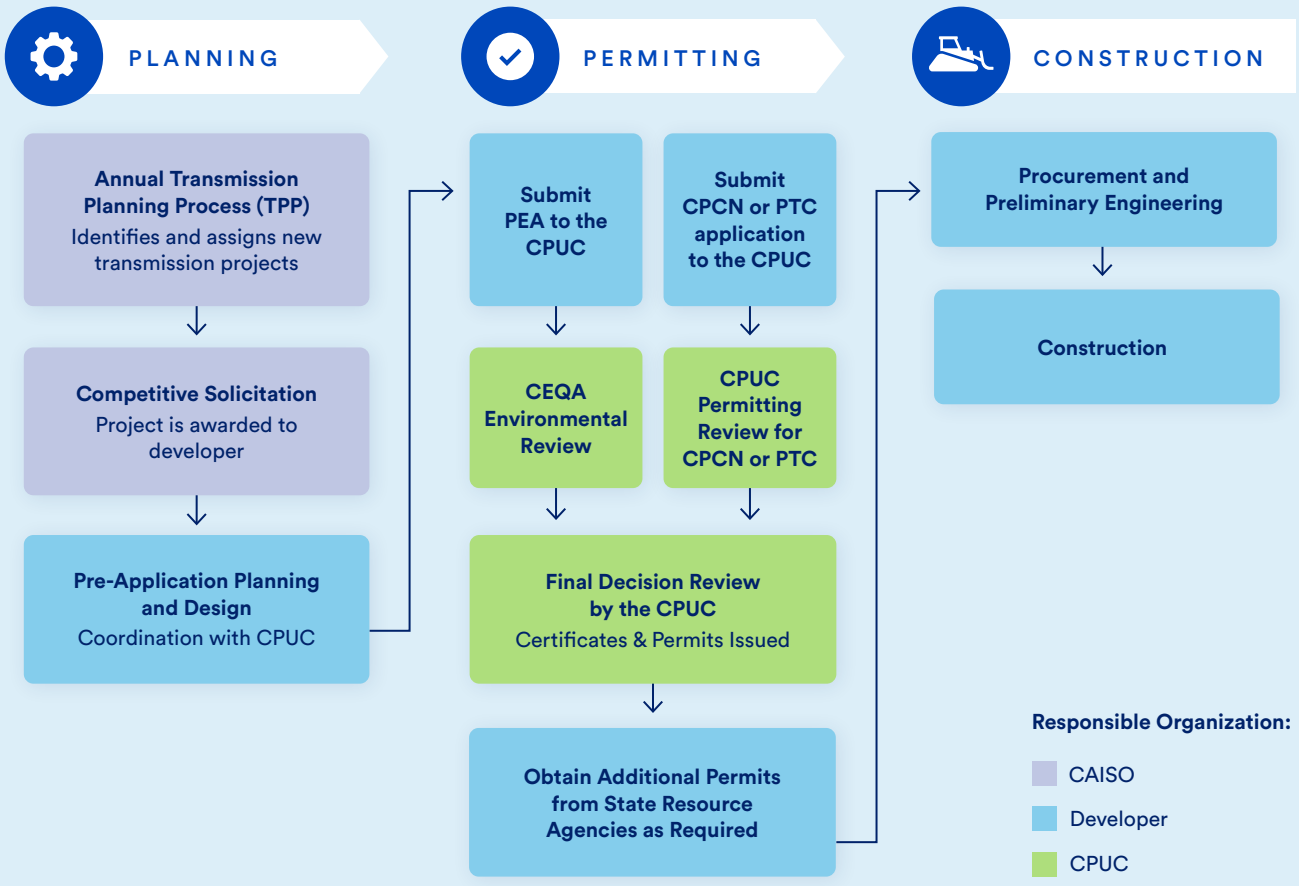
From Concept to Completion – How Transmission is Built in California

The CPUC typically anticipates major transmission projects require five or six years to progress from a concept to fully constructed under ideal conditions.[3] In reality the process is often delayed and can take ten or more years to complete. The following section provides an overview of the key phases of the transmission development process, from concepts in CAISO's Transmission Planning Process (TPP) to active transmission infrastructure.

New transmission projects are first identified in CAISO's annual TPP. Most of these projects are built and owned by the incumbent utility providing retail service to the area, but major regional projects above 200 kV are awarded to developers following a CAISO-led competitive solicitation process. Developers may be the utilities or third-party companies specializing in transmission project design, construction, and operation. After the projects are awarded, developers will begin to design and scope the project and prepare permit applications for the CPUC. The CPUC then leads two review processes: an environmental review and a review for permits and certificates. Once the developer is awarded the necessary certificates and permits from this process, they are free to construct the project. Each of these phases is discussed in more detail below.

[3] California Public Utilities Commission (CPUC), "General Information on Permitting Electric Transmission Projects at the CPUC", June 2009. https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/g/5065-general-information-on-permitting-electric-transmission.pdf

California's Transmission Development Process



PHASE 1:

CAISO's Transmission Planning Process

California's new transmission projects are identified when CAISO conducts its annual Transmission Planning Process (TPP), which reevaluates the electricity system's needs, assesses opportunities to strengthen reliability, and accounts for the state's resource planning and policy goals. The process ultimately identifies new transmission lines and upgrades to existing facilities needed to meet reliability, public policy, or economic requirements.

The final plan provides a list of projects for incumbent transmission owners to undertake, as well as those to be considered for competitive solicitation. In 2011, the Federal Regulatory Energy Commission (FERC) issued Order 1000 which encourages bidding for transmission projects but limits competitive solicitation only to regional transmission facilities. Thus, any qualifying regional transmission facility – those that are 200 kV or above and identified for reliability, policy, or economic need – are subject to competitive solicitation in the CAISO region. Projects below 200 kV that span more than two transmission service areas, or that extend beyond CAISO's authority, are also subject to competitive solicitation. Upgrades to existing facilities within or outside requirements and projects with local cost allocation do not undergo solicitation.

Most transmission projects are taken on by incumbent owners. A 2019 report by The Brattle Group found that between 2013 and 2017, competitive projects accounted for only 6.8% of transmission investment in the CAISO region (though still above the national average of 3%).[4]

PHASE 2:

Competitive Solicitation Process (if applicable)

For projects subject to the competitive solicitation process, utilities submit proposals to build, own and maintain projects identified in the transmission plan. CAISO opens the bid window for a specified ten-week period following board approval of the final plan. When there are multiple facilities open for solicitation, CAISO may stagger opening windows to accommodate the work and resources needed to develop applications. Applications include a proposed financial plan, proof of adequate financial standing, records of the utility's existing procedure and practices, plans for construction, operation, and maintenance, and an anticipated project timeline. When selecting a developer, CAISO considers estimated cost, cost caps, timelines, utility experience, and advanced acquisition of rights of way or property. After a project is awarded, the selected utility begins planning the project.

[4] The Brattle Group, "Cost Savings Offered by Competition in Electric Transmission", April 2019. https://www.brattle.com/wp-content/uploads/2021/05/16726_cost_savings_offered_by_competition_in_electric_transmission.pdf

PHASE 3:

Project Submission to the CPUC

Utilities submit applications for two CPUC processes: an environmental review pursuant to the California Environmental Quality Act (CEQA) and a CPUC review for permits and certificates.

To prepare for the environmental review, the utility conducts and submits a Proponents Environmental Assessment (PEA). The PEA is a preliminary assessment of the project's potential environmental impacts and alternatives.

The secondary CPUC review begins with an application for either a Certificate of Public Convenience and Necessity (CPCN) or a Permit to Construct (PTC). A CPCN applies to new regional transmission lines above 200 kV. A PTC applies to projects between 50 kV and 200 kV and for any substation above 50 kV.[5]

To prepare for either a CPCN or a PTC review, the utility will scope the project and study area, compile environmental information, start engaging with local communities, and begin consultations with land use and natural resource management stakeholders. The CPUC and the utility coordinate during this process to determine potential cost-effective alternatives that would still meet the need for the project and to ensure the application is complete. Alternatives could include variations in the routing, siting, or location of a project or variations in line voltages or technologies used. In some cases, an alternative could be not building the project at all if the need could be met through other means such as energy conservation, additional generation, or load management.

Both the environmental review and the CPUC review processes happen concurrently, but the CPUC cannot issue a decision on the CPCN or PTC until the environmental review is complete.

PHASE 4:

Environmental Review

As the lead agency of the environmental review, the CPUC conducts an environmental assessment pursuant to CEQA and in line with CPUC environmental rules. Some projects may trigger a federal National Environmental Policy Act (NEPA) review if they cross federal land or utilize federal funds. After reviewing the developer's application, the CPUC will determine if CEQA applies and conduct an initial study to determine which level of environmental review – a Mitigated Negative Declaration (MND) or an Environmental Impact Report (EIR) – is required. If the project is not anticipated to have potentially significant impacts on the environment, or the utility has already identified ways to mitigate impacts, the CPUC will issue an MND. If the project is anticipated to have significant impact on the environment, the CPUC will issue an EIR.

The environmental review considers impacts on air, water, and noise quality, as well as the impacts on biological, agricultural, cultural, and mineral resources. The CPUC will create iterations of an EIR that considers findings from the PEA, consultation with other agencies, and public comments. The timeline of this phase varies greatly based on the quality of the application and PEA, project location, cost, strength of public opposition, and coordination required with federal agencies.[6]

[5] For projects smaller than 50 kV, the utility may only need to submit an Advice Letter as a Notice of Construction rather than an application.

[6] California Public Utilities Commission (CPUC), "Electric Transmission Siting at the California Public Utilities Commission", January 2009. https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/t/5073-transmission-siting-flow-chart.pdf

PHASE 5:

CPUC Permitting Review

The CPUC undertakes its own review of projects requiring a CPCN or PTC. The level of analysis required varies with the size of the transmission project, as codified in CPUC General Order 131-D. For new lines over 200kV that require a CPCN, the CPUC will analyze both the need for the project and the economics of the project, in addition to environmental impact. This process requires the CPUC to make a "needs determination" and economic analysis, in addition to and following CAISO's determination of need, to show that the project is cost effective and necessary to meet and promote the health, safety, comfort, and convenience of the public. Projects requiring a PTC[7] do not require a full assessment of needs or costs and are primarily reviewed for the level of environmental impact.

When the application is submitted, an Administrative Law Judge (ALJ) and an Assigned Commissioner are selected to lead the proceeding. Both the CPCN and PTC are subject to a hearing should the public submit protest within 30 days of the application's filing. Protests may be filed by individuals, local governments, state agencies, or community organizations concerned with project cost, location, or impact on the community or environment. This protest process is led by the ALJ and consists of a series of conferences and hearings, including opportunities for public participation, and is similar to a court case. If no protests are filed, or once protests are resolved, the ALJ will prepare a decision on whether to approve the project.

PHASE 6:

Issuing a Decision and Permits

Once the environmental and CPUC reviews are complete, the ALJ will review the findings from the environmental review and CPUC review and submit a proposed decision to the Commission. The Commissioners will then vote to approve permits for the project at a meeting of the full Commission. After the CPUC issues a decision, the utility may need to pursue additional permits from state resource agencies such as the State Water Resources Control Board (SWRCB).[8]

PHASE 7:

Construction

Following the award of necessary permits and certificates, the developer is free to construct the project. Delays in construction may still occur due to legal, environmental, and land acquisition challenges.

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7 Projects between 50 kV and 200 kV and substations over 50 kV

8 California Public Utilities Commission (CPUC), "Federal, State, and Local Permitting Processes Likely to be Required for Electric Transmission Projects", June 2009. https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/g/5066-generictransmissionlinepermit.pdf

Trends from Past and Ongoing Transmission Projects

Due to complexity of the planning and permitting process and the combination of challenges inherent to building large infrastructure, transmission projects are rarely completed on time. The trends below are based on an analysis of the timelines of thirteen projects approved in CAISO's Transmission Plans between 2012 and 2019. Nine projects were eligible for competitive solicitation and four went directly to the incumbent utility.

Of the thirteen projects we reviewed (shown on the following page):

- Two projects were completed but experienced considerable delays
- Two projects were canceled or put on hold by CAISO
- Eight projects have yet to be completed and are delayed past their anticipated online date
- One project is yet to be completed but is still on track to be constructed on time

A review of these project timelines points to the following trends:

- Projects frequently stretch beyond completion dates anticipated by CAISO.
- The competitive solicitation process is regularly completed within one year and is the only phase of project development that is consistent in duration.
- Delays are particularly acute during (1) the time it takes the developer to prepare to submit a project application to the CPUC, and (2) the environmental review.
  - It took between one to six years for utilities to submit CPCN or PTC applications and PEAs to the CPUC. Environmental reviews lasted between 16 months and four years.
  - Of the projects reviewed, projects developed by an incumbent transmission owner took more time to submit applications to the CPUC than projects developed by a third party or jointly developed by the incumbent transmission owner and a third party.
- The project that took longest to complete is a multistate project where a federal agency prepared the governing environmental documents.

While this review did not focus on project costs, other reports show that costs associated with building transmission infrastructure are typically much higher than originally estimated. According to a 2019 study by the Brattle Group, between 2013 and 2017, the estimated final costs of CAISO-approved projects were 33% higher on average than the original costs submitted to the CPUC for those projects.[9] Since many of these projects have not yet been completed and submitted to FERC for final cost recovery approval, there is not sufficient data to determine overall cost escalations throughout the entire permitting and construction process. The same report assessed the potential cost savings of competitive solicitation and found that bidding for CAISO projects has resulted in an estimated 29% cost savings compared the anticipated cost of the incumbent utility.[10]

Other evidence shows that transmission is becoming more costly, represents a growing proportion of customers' bills, and will have impacts on ratepayers. A 2021 CPUC report found that transmission revenue requirements increased over 38% between 2016 and 2021. The report also forecasted electric rates will likely be 10% to 20% higher than the rate of inflation between 2021 and 2030.[11]

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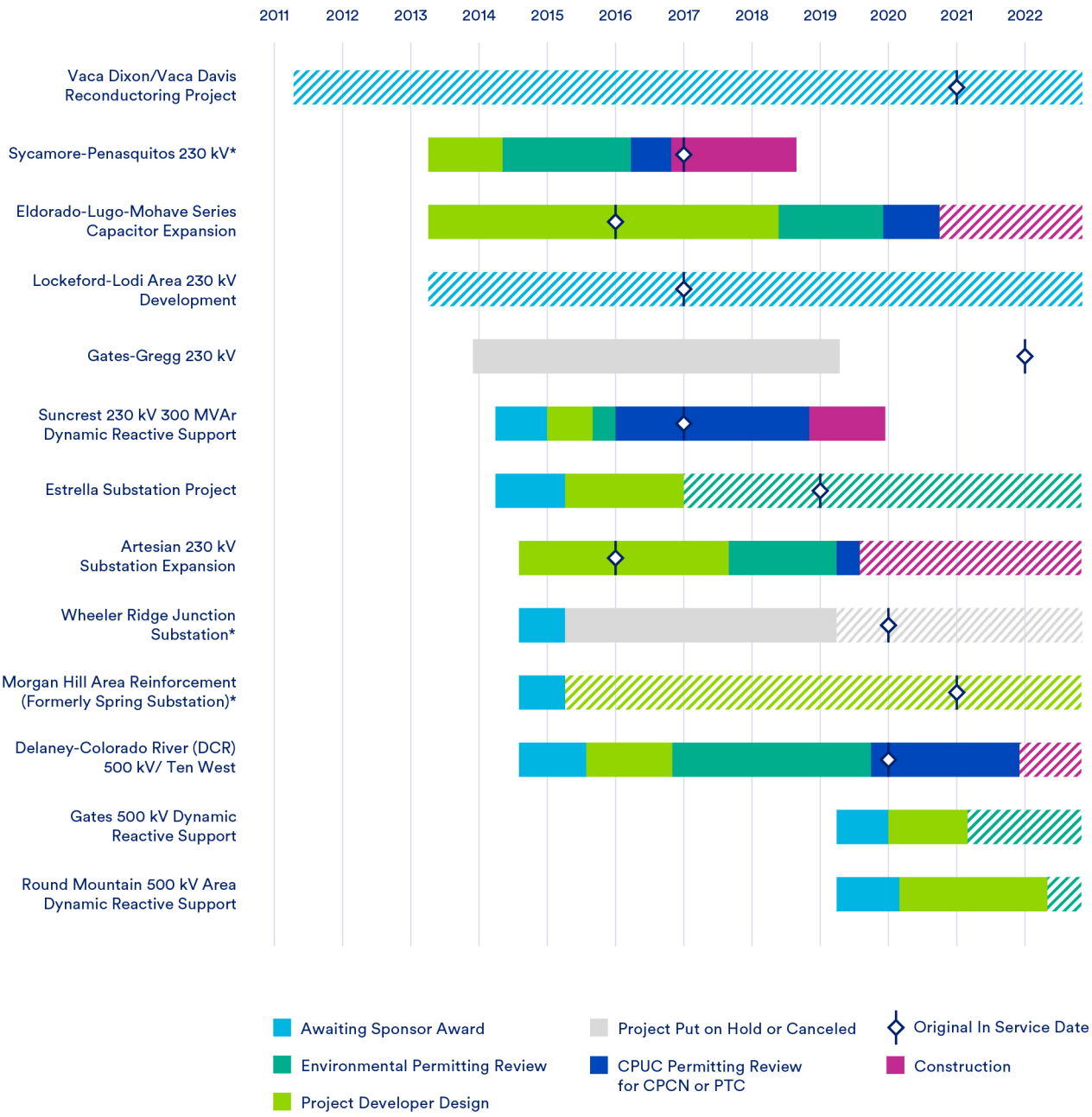
9 The Brattle Group, "Cost Savings Offered by Competition in Electric Transmission", April 2019, pg. 55. https://www.brattle.com/wp-content/uploads/2021/05/16726_cost_savings_offered_by_competition_in_electric_transmission.pdf

10 The Brattle Group, "Cost Savings Offered by Competition in Electric Transmission", April 2019, pg. 9. https://www.brattle.com/wp-content/uploads/2021/05/16726_cost_savings_offered_by_competition_in_electric_transmission.pdf

11 California Public Utilities Commission (CPUC), "Utility Cost and Affordability of the Grid of the Future Report", May 2021, pg. 38. Forecasted electric rate range varies depending on the utility. https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/office-of-governmental-affairs-division/reports/2021/senate-bill-695-report-2021-and-en-banc-whitepaper_final_04302021.pdf

CAISO Approved Transmission Project Timelines



Timelines begin upon CAISO approval in the TPP. Bars represent time until each process was completed. Hashed bars represent ongoing process to date.
* Indicates a utility run project.

Recommendations

The current transmission development process is marked by delays and cost escalations. The *status quo* is likely unsuited to the pace and scale of transmission required to meet California's climate goals. While additional dialogue, exploration, and analysis of issues facing transmission development in the state are needed, the following recommendations could accelerate the permitting process, manage ratepayer impacts, and proactively develop transmission so vitally needed to reach the state's clean energy goals.

1 Accelerate the Transmission Permitting Process

Today, the transmission permitting process is a long, complex, multi-agency effort that will likely become more difficult as the pace of transmission development increases in the state and as more projects require federal agency reviews and/or span multiple states.

- The CPUC should consider its anticipated rewrite of General Order 131-D as an opportunity to re-examine qualifications for CPCN or PTC applications. The level of review afforded to different types of projects should be reconsidered to reflect the state's current transmission development needs.
- Major projects are currently reviewed twice to assess whether they are needed, once during CAISO's TPP process and again when reviewed under the CPUC CPCN application. Consolidating this assessment to a single review—for example by strengthening CAISO's initial review process to the standards comparable to CPUC's review process—could lead to considerable cost and time savings.
- Policymakers should consider expanding the circumstances in which projects are competitively awarded. Evidence in California and elsewhere suggests third-party developers specializing in transmission projects develop their projects faster and for less cost than traditional utilities.
- AB205 streamlined the permitting process for certain non-fossil power plants. Following this model, policymakers should consider whether a similar designation and streamlining process may be warranted for transmission facilities.

2 Manage Ratepayer Impacts of Transmission Buildout

There is a general lack of transparency in cost and cost drivers that limits the ability of policymakers to support and promote affordable rates.

- CPUC should require cost reporting for major transmission projects developed by utilities, and these reported costs should use a consistent methodology and be made publicly available.
- Policymakers should consider providing state financing of transmission projects required to meet public policy objectives (through the General Fund, the Greenhouse Gas Reduction Fund, or bond financing) to manage ratepayer impacts.

3 Proactively Plan and Develop Transmission

The pace of new clean energy development required to meet California's clean energy goals far outpaces the speed of at which transmission projects are planned, permitted, sited, and built. The state should identify and develop critical transmission projects much more proactively so they are available when and where new clean energy is likely to be built.

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[12] California Energy Commission (CEC), "Report to the Governor on Priority SB 100 Actions to Accelerate the Transition to Carbon-Free Energy", September 2021. https://www.energy.ca.gov/publications/2021/report-governor-priority-sb-100-actions-accelerate-transition-carbon-free-energy

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