



Together, Building
a Better California

Transmission Development Forum

Generation Interconnection Project (GIP) Upgrades
and Transmission Planning Process (TPP)
Upgrade Status

April 26, 2022



Presentation Summary

- PG&E workbooks capturing Generator Interconnection Projects (GIP) and Transmission Planning Process (TPP) project statuses.
- This presentation provides updates and the opportunity for discussion on the status of GIP and TPP projects that are highest priority to immediate generation interconnection. This is a technical discussion on the projects.
- PG&E requests that stakeholders save questions until the completion of each slide. Projects have been grouped to enable efficient and productive discussion.



Recurring Updates

- PG&E identifies the Transmission Development Forum (TDF) as the method by which stakeholders should get updates on Generation Triggered Reliability and Deliverability projects.
- The Excel Workbook associated with this presentation will contain projects that have been triggered by interconnection agreements while it will not have upgrades not yet triggered by an interconnection agreement.
- PG&E Interconnection Managers and Assigned Project Managers will ask that Interconnection Customer Teams focus requests on the status of triggered upgrades through the TDF each quarter.
- Where in-service dates are within the current Quarter, a more reactive method to push updates is needed. PG&E requests input from TDF stakeholders before making any change.



PG&E Projects Status Summary

Projects with Schedule Improvements

Project No.	Scope	Status	Planned * Const. Start	Q1 Report Dated	Planned ** In-Service	Comments
GIP C12P2-PNU-02	Gates 230 kV circuit breakers 352, 362 and 372 overstress mitigation (Cap Banks) Replace Gates 230 kV circuit breakers 352, 362 and 372 with 63 kA interrupting capability	In-Flight	Q4-2022	Q2-2023	Q1-2023	Interim solution not needed while the bank is out. Completing the work with Bank 11 out.
TPP	Cottonwood 115 kV Bus Sectionalizing Breaker Replace Cottonwood Transformer Banks 1 & 4, replacement of six circuit breakers, addition of bus parallel circuit breaker, and upgrade the aging protection and control equipment at the Cottonwood substation.	In-Flight	Q2-2024	Q4-2025	Q1-2025	Construction Sequencing by Q3-2022.
TPP	Gates 500 kV Dynamic Voltage Support This project proposes to add 500kV breakers, switches, bus work and associated equipment required to connect the voltage support equipment.	In-Flight	Q1-2023	Q1-2025	Q2-2024	Sensitive to supply chain risks and 3rd Party CEQA dependencies
TPP	Kasson – Kasson Junction 1 115 kV Line Section Reconductoring Project Reconductor the Kasson -Kasson Junction 1 (~0.08 miles) 115 kV line section with larger conductor, replace structure if needed, and limiting terminal equipment at Kasson sub.	In-Flight	Q3-2025	Q2-2027	Q4-2025	Kickoff- Q2-2022
TPP	Manteca #1 60 kV Line Section Reconductoring Project Reconductor ~1.13 miles of the Manteca #1 60 kV Line with larger conductor and remove any limiting component as necessary.	In-Flight	Q4-2025	Q2-2027	Q1-2026	Kickoff- Q2-2022

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PG&E Projects Status Summary

Projects with Schedule Improvements

Project No.	Scope	Status	Planned * Const. Start	Q1 Report Dated	Planned ** In-Service	Comments
GIP 21rsmt-3	Kern PP Substation 115 kV CBs 182, 262 and 282 overstress (BAAH Conversion Phase 1) Kern PP Sub: Existing PG&E 115 kV BAAH conversion project will cover this replacement.	In-Flight	Q3-2021	Q1-2026	Q1-2023	CB282 will be removed from service in Mar 2023 and the new BAAH Section In-Service Apr 2023
GIP 21rsmt-3	Kern PP Substation 115 kV CBs 182, 262 and 282 overstress (BAAH Conversion Phase 2 - incl CB282) Kern PP Sub: Existing PG&E 115 kV BAAH conversion project will cover this replacement.	In-Flight	Q2-2023	Q1-2026	Q4-2023	CB282 will be removed from service in Mar 2023 and the new BAAH Section In-Service Apr 2023
GIP 21rsmt-3	Kern PP Substation 115 kV CBs 182, 262 and 282 overstress (BAAH Conversion Phase 3 - incl CB262) Kern PP Sub: Existing PG&E 115 kV BAAH conversion project will cover this replacement.	In-Flight	Q1-2024	Q1-2026	Q4-2024	CB262 will be removed from service in Jan 2025 and this sectionalizing breaker will be eliminated
GIP 21rsmt-3	Kern PP Substation 115 kV CBs 182, 262 and 282 overstress (BAAH Conversion Phase 4 - incl CB182) Kern PP Sub: Existing PG&E 115 kV BAAH conversion project will cover this replacement.	In-Flight	Q1-2025	Q1-2026	Q4-2025	CB182 will be removed from service in Jan 2026 and the new BAAH Section In-Service Feb 2026
GIP C12P2-GRNU3	Midway Substation 500 kV CB 712 overstress Replace Midway Substation 500 kV CB 712 with 63 kA interrupting capability	In-Flight	Q4-2022	Q4-2025	Q1-2022	Passed Inspection 2/15/2022 Q1 Notes: Q4 2022 unless inspection fails then Q4-2025

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Project No.	Scope	Status	Planned * Const. Start	Q1 Report Dated	Planned ** In-Service	Comments
GIP C13P1-GPN04	Metcalf Substation 230 kV capacitor circuit breakers Interim Solution	In-Flight	Q3-2022	Q2-2025	Q3-2022	Target Q4 2022 needed by 12/1/22 for first IC.
TPP	Monta Vista 230 kV Bus Upgrade Upgrade the 230kV transmission bus configuration at Monta Vista Substation in Cupertino to improve electric system resiliency. Phase 2: Reconnect the 230/115 kV No. 3 Transformer to the 230 kV bus position occupied by the old 230/60 kV transformer; Install new 230 kV bus-sectionalizing and bus-parallel breakers; Install new 230 kV MPAC building	In-Flight	Q4-2020	Q3-2024	Q3-2024	Phase 1 was complete in Q1-2019
TPP	Oro Loma 70 kV Area Reinforcement The Oro Loma 70 kV Area Reinforcement Project will create a new 230 kV transmission substation to help ensure reliable electric service to customers in the Merced County. The project will build a new 230/70 kV substation that will loop the Los Banos – Panoche 230 kV Line No. 2 onto the existing Mercy Springs Switching Station and rebuild the 70 kV line between the Switching Station and Canal Substation as a double circuit line.	In flight	Q2-2026	Q4-2026	Q3-2026	Deferred, scoping and engineering resuming in 2022. Impacting C13-PII
TPP	Palermo – Wyandotte 115 kV Line Section Reconductoring Project Reconductor the Wyandotte Pole 003/025 115 kV line section (~0.05 miles) with larger conductor and remove any limiting element.	In-Service	Q3-2021	Q3-2022	Q3-2021	
TPP	Reedley 70 kV Reinforcement (Renamed to Reedley 70 kV Area Reinforcement Projects) This project proposes to build an approximately 7MW 4- hour energy storage system connected to the PG&E's Dinuba Substation.	In flight	Q2-2023	Q4-2025	Q3-2025	

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TPP Projects

Project No.	Scope	Status	Planned * Const. Start	Q1 Report Dated	Planned ** In-Service	Comments
TPP	Cascade 115/60 kV No.2 Transformer Project Replace the 115/60kV Bank 1, add a second 115/60kV bank (Bank 2), upgrade the 115kV bus to breaker-and-a-half (BAAH), install a modular control building (MPAC), and replace four 60kV circuit breakers at Cascade Substation.	In-Flight	Q4-2019	Q4-2023	Q4-2024	Material delays, execution and continuity of contract delays, prioritization and work sequencing
TPP	Cooley Landing-Palo Alto and Ravenswood-Cooley Landing 115 kV Lines Rerate	In-Flight	Q1-2023	Q4-2022	Q1-2023	Reprioritization. Ravenswood-Cooley Landing Line Re-rate not needed covered under Reconductoring with ISD Q1-2023
TPP	Cottonwood 230/115 kV Transformers 1 and 4 Replacement Project Replace Cottonwood Transformer Banks 1 & 4, replacement of six circuit breakers, addition of bus parallel circuit breaker, and upgrade the aging protection and control equipment at the Cottonwood substation.	In-Flight	Q3-2024	Q4-2024	Q1-2025	Construction Sequencing by Q3-2022 starting with 115kV side followed by 230kV side.
TPP	Lockeford-Lodi Area 230 kV Development The Lockeford-Lodi Area 230 kV Development Project will loop the Brighton – Bellota 230 kV Line into Lockeford 230 kV Substation to bring a new 230 kV source into the area.	In-Flight	Q3-2026	Q2-2027	Q4-2028	Delayed due to CEQA process presently under way
TPP C11P2-NP02 C11P2-NP01	Contra Costa PP 230 kV Line Terminals Reconfiguration Project Replaces need for: Contra Costa 230kV Bus Sections D, E and F and circuit breaker 820 overload Contra Costa 230kV SW's 601, 603 overload	In-Flight		Q4-2025	Q4-2025	CAISO Alternative Approved Dec 2021

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Project No.	Scope	Status	Planned * Const. Start	Q1 Report Dated	Planned ** In-Service	Comments
TPP	<p>Midway – Kern PP #2 230 kV Line (Bakersfield-Kern Reconductor)</p> <p>The Project will also reconductor approximately 13 circuit miles of the Bakersfield Nos. 1 and 2 230 kV Tap Lines. This project is needed to provide additional transmission capacity and reliability to serve electric customers in Kern County.</p>	In flight	Q4-2026	Q2-2024	Q2-2027	Reprioritization
TPP	<p>Midway – Kern PP #2 230 kV Line</p> <p>This project proposes to reconductor approximately 42 circuit miles of the Midway - Kern No. 1 230 kV Line, and split the No. 1 line into Midway - Kern No. 1 and No. 2 230 kV Lines, and remove crosstie connections to split the Midway - Kern No. 1 230 kV Line. Remove the Stockdale Nos. 1 and 2 230 kV Tap Lines from the Midway – Kern 230 kV lines and relocate directly to the Kern PP 230 kV bus.</p>	In flight	Q4-2024	Q2-2024	Q3-2025	Midway BAAH Bus D - delaying this work
TPP	<p>Midway-Temblor 115 kV Line Reconductor and Voltage Support</p> <p>This project proposes to upgrade 14.5 miles of conductor and four (4) transmission switches (Nos. 137, 139, and 157) on the Midway – Temblor 115 kV Line, and install 40 MVAR shunt capacitors at Temblor Substation in order to provide additional transmission capacity and reliability to serve electric customers in Kern County.</p>	In-Flight	Q2-2027	Q4-2027	Q1-2028	Reprioritization
TPP	<p>Newark-Milpitas #1 115 kV Line Limiting Facility Upgrade</p>	In-Flight	Q1-2023	Q4-2022	Q2-2023	Reprioritization

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TPP Projects

Project No.	Scope	Status	Planned * Const. Start	Q1 Report Dated	Planned ** In-Service	Comments
TPP	Red Bluff-Coleman 60 kV Reinforcement This project proposes to reconductor the Coleman-Red Bluff 60 kV line.	In-Flight	Q3-2025	Q4-2025	Q3-2026	
TPP	Vierra 115 kV Looping Project Loop the Tesla-Stockton Co-Gen Junction 115kV Line into Vierra Substation, convert the Vierra 115kV bus into a 4-bay breaker-and-a-half (BAAH) bus configuration, add a Howland Road Co-Gen Radial Feed, install a 115kV Sustainable Modular Protection (SMP) / Modular Protection Automation and Controls (MPAC), and install battery buildings.	In-Flight	Q1-2027	Q2-2025	Q1-2027	BAAH Project ISD expected Q1-2024
TPP	Wilson 115 kV Area Reinforcement Install new 115 kV and 230 kV Breaker-and-a-half (BAAH) Bus Arrangements, two Modular Protection and Automation Control (MPAC) Buildings, and two new 230/115 kV Transformers.	In flight	Q2-2025	Q3-2026	Q3-2027	Reprioritization
TPP	Wilson-Le Grand 115 kV line reconductoring This project proposes to reconductor approximately 14 miles of the Wilson -LeGrand 115kV Line with 477 ACSS conductor or equivalent and replaces 146 wood poles with new light duty steel poles (LDSP). This project was recommended by the CAISO as a policy driven upgrade.	In-Flight	Q4-2022	Q1-2022	Q4-2022	Clearance moved from Q1 2022 due to Cogen Impacts then from to Q4 2023 due to system loading

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PG&E Projects Status Summary

Generation Interconnection Project Upgrades

Project No.	Scope	Status	Planned * Const. Start	Q1 Report Dated	Planned ** In-Service	Comments
GIP C11P2-FC01	Midway 500kV CB's 722 Overstress Midway Sub: Replace 500kV CB's 722, SW's and Relays	In-Flight	Q3-2022	Q4-2025	Q4-2025	Q3-2022 unless inspection fails then Q4-2025
GIP C11P2-FP01	Midway 500 kV circuit breakers 732, 802, 832 and 842 overstress Replace Midway 500 kV circuit breakers 732, 802, 832 and 842 and associated switches/relays	In-Flight	Q4-2022	Q3-2022	Q4-2025	CB732/832 – Passed 4/1/22; CB 802 & CB 842 Q3-2022 unless inspection fails then Q4-2025
GIP C12P2-KC01	Midway Substation 500kV CB 722 Overload mitigation Replace Midway 500 kV CB 722 to achieve 3600 A emergency rating	In-Flight	Q4-2022	Q4-2025	Q4-2025	Q3-2022 unless inspection fails then Q4-2025

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Generation Interconnection Project Upgrades

Project No.	Scope	Status	Planned * Const. Start	Q1 Report Dated	Planned ** In-Service	Comments
GIP 20rsmt-4	Metcalf 115kV breakers Overstress (almost all breakers) (Reactors) Install 2 x 5.3 ohm reactors at Metcalf 115 kV between bus sections D and E	In-Flight	Q3-2024	Q1-2025	Q3-2025	Depends on relocating some other equipment / re-arrange the bus to do the work to minimize or avoid clearances. Space for the new install is needed.
GIP 20rsmt-5	Tesla 500 kV circuit breaker 612 overstress Replace Tesla Substation 500 kV CB 612 and associated switches/relays	In-Flight	Q1-2024	Q1-2024	Q2-2024	CB612: Q1-2024; Multiple overlapping of projects at Tesla
GIP C12P1-GPT01	Ames Distribution 115 kV circuit breaker 132 overstress Replace Ames Distribution 115 kV circuit breaker 132	In-Flight	Q1-2024	Q1-2024	Q2-2024	Evaluating solution alternatives. Constraints, limited space for required upgrades. Sequencing and Clearances in final plan are a risk based on existing configuration.
GIP C12P1-NPT04	Vaca Dixon Substation 230 kV circuit breakers 442, 452 and 462 overstress Replace Vaca Dixon Substation 230 kV circuit breakers 442, 452 and 462 and associated switches/relays	Initiating	Q1-2023	Q1-2024	Q2-2024	

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Generation Interconnection Project Upgrades

Project No.	Scope	Status	Planned * Const. Start	Q1 Report Dated	Planned ** In-Service	Comments
GIP 21rsmt-1	Henrietta Substation 70kV CBs 12 and 72 Overstress Henrietta Sub: Replace 70kV CB 12 & 72 and switches.	In-Flight	Q1-2024	Q4-2025	Q2-2026	These projects will be replaced in a larger Henrietta Sub PG&E project.
GIP 21rsmt-5	Palo Alto 115 kV circuit breakers 412 and 442 overstress Replace Palo Alto 115 kV circuit breakers 412 and 442 with 63 kA interrupting capability	In-Flight	Q1-2024	Q3-2024	Q1-2025	Re-sequenced to minimize customer impacts
GIP 21rsmt-SCD-23	El Cerrito G 115kV CB 112, 142, 132 Overstress Replace Overstressed Circuit Breakers	In-Flight	Q1-2023		Q3-2024	CB112 & CB142 were replaced under emergency New BAAH replaces all Q3-2024
GIP C12P1-GCR01	Moraga 115 kV circuit breakers 582, 612, 622, 642 and 712 overstress Replace Moraga 115 kV circuit breakers 582, 612, 622, 642 and 712	Not Triggered		Q4-2026	Q1-2027	
GIP C12P1-NPN02	Lodi Substation 60 kV circuit breakers 12 and 22 overstress	In-Flight	Q3-2020	Q1-2022	Q4-2022	City of Lodi Public Works requirements expanded scope and schedule. Other factors have also delayed schedule to Q4-2022
GIP C12P1-NPT01	Gold Hill Substation 115 kV circuit breakers 142 and 172 overstress Replace Gold Hill Substation 115 kV circuit breakers 142 and 172 and associated switches/relays	In-Flight	Q3-2023	Q3-2023	Q1-2024	Q1507 has signed an IA and triggers this work to move forward.

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PG&E Projects Status Summary

Deliverability Reconductoring Projects

Project No.	Scope / Description	Status	Planned * Const. Start	Q1 Report Dated	Planned ** In-Service	Comments
GIP C11P2-ND01	Re-conductor Fulton-Hopland 60 kV Line (Fitch Mountain Tap-Geysers Jct) Re-conductor Fulton-Hopland 60 kV Line (Fitch Mountain Tap 009/005A-Geysers Jct 016/004) ~7 mi total length with 715 AAC	Initiating		Q1-2026	Q4-2027	Kickoff May 2022; Project Initiated due to Signed Interconnection Agreements
GIP C9P2-N02	Re-conductor Fulton-Hopland 60 kV Line (Geysers Jct-Cloverdale Jct-Hopland) Re-conductor 24.21 mi Fulton-Hopland 60 kV Line (Geysers Jct 016/003A-Cloverdale Jct 026/002-Hopland) with 715 AAC and upgrade any limiting equipment	Initiating		Q2-2027	Q1-2027	Kickoff May 2022; with above GIP scope.
GIP C9P2-N09	Re-conductor Stockton A-Weber #3 60 kV Line (Stockton A-Hazelton Jct) Re-conductor 0.9 mi of Stockton A-Weber #3 60 kV Line from Stockton A to Hazelton Jct Pole 000/026 with 715 AAC.	In-Service	Q1-2022	Q1-2022	Q1-2022	Line is In-Service.
GIP C8P2-10	QC8RAS-02 SPS (Deliverability Triggered RNU) QC8SPS-02 SPS to modify the existing Hatchet Ridge SPS to trip Q1106 200 MW wind and Hatchet Ridge 102 MW wind for thermal overloads on the Q1106 SS-Cottonwood, Carberry SS-Round Mountain or Pit #3-Carberry SS 230 kV Lines.	In-Flight	Q1-2023	Q3-2023	Q3-2023	Schedule is maintaining planned dates.
GIP C8P2-3	QC8RAS-08 RAS (Deliverability Triggered RNU) QC8RAS-08 RAS to trip Generation offline for outage AND overload of either Gates 500/230 kV Transformer Bank 11 or 12	In-Flight		Q1-2023	Q1-2023	Q2 Notes: Construction sequence sensitive to supply chain delays.

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Deliverability Reconductoring Projects

Project No.	Scope / Description	Status	Planned * Const. Start	Q1 Report Dated	Planned ** In-Service	Comments
GIP C8P2-1	Re-conductor Borden-Gregg #1 230 kV Line Re-conductor 6.25 mi Borden-Gregg #1 230 kV Line with 1113 ACSS and upgrade equipment to 2000 A minimum (this is the existing Borden-Gregg 230 kV Line)	In-Flight	Q3-2025	Q1-2026	Q1-2026	Routing issues with existing alignment. Re-route alternatives under review. Start dependency on Bellota-Cottle Finish
GIP C9P1-F12	Re-conductor Borden-Gregg #2 230 kV Line Re-conductor 6.25 mi Borden-Gregg #2 230 kV Line with 1113 ACSS	In-Flight	Q1-2025	Q2-2025	Q2-2025	
GIP C8P1-35	Re-conductor Los Banos-Quinto SS 230 kV Line Re-conductor 6.11 mi Quinto Sw Sta-Los Banos 230 kV Line with super bundled 795 ACSS	In-Flight	Q1-2022	Q2-2022	Q2-2023	Materials delays from Q2-2022 to Q2-2023
GIP C8P2-6	Re-conductor Los Banos-Q779 SS #1 230 kV Line Re-conductor 4.5 mi Los Banos-Padre Flat SS #1 230 kV Line with 1113 ACSS and upgrade equipment to 1900 A.	In-Flight	Q4-2022	Q1-2023	Q1-2023	
GIP C8P1-34	Re-conductor Padre Flat SS-Panoche #1 230 kV Line Re-conductor 32.59 mi Q779/Padre Flat SS-Panoche #1 230 kV Line with 795 ACSS	In-Flight	Q4-2023	Q2-2024	Q2-2024	
GIP C9P1-F11	Re-conductor Dos Amigos PP-Panoche #3 230 kV Line Re-conductor 23.63 mi Dos Amigos PP-Panoche #3 230 kV Line with 795 ACSS	In-Flight	Q3-2024	Q2-2025	Q2-2025	

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