

### Transmission Development Forum

April 25, 2023

California ISO Public

#### Reminders

- Stakeholder calls and meetings related to Transmission Planning are not recorded.
  - Given the expectation that documentation from these calls will be referred to in subsequent regulatory proceedings, we address written questions through written comments, and enable more informal dialogue at the call itself.
  - Minutes are not generated from these calls, however, written responses are provided to all submitted comments.
- To ask a question, press #2 on your telephone keypad. Please state your name and affiliation first.
- Calls are structured to stimulate an honest dialogue and engage different perspectives.
- Please keep comments friendly and respectful.



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### Transmission Development Forum Stakeholder Call – Agenda

Торіс	Presenter
Overview	Jeff Billinton – CAISO
Valley Electric Association / GridLiance West	VEA/GLW
Southern California Edison	SCE
San Diego Gas & Electric	SDG&E
Pacific Gas & Electric	PG&E
Wrap-up	Jeff Billinton



#### Overview

- The CAISO is hosting, in collaboration with the CPUC, the Transmission Development Forum
- The purpose of the Transmission Development Forum is to create a single forum to track the status of transmission network upgrade projects that affect generators and all other transmission projects approved in the CAISO's transmission planning process
  - will not address individual interconnection concerns, but instead is intended to provide all stakeholders information on the status of new transmission projects and network upgrades
  - Will not include cost information



The scope of the projects for the forum are:

- Previously approved projects through the CAISO transmission planning process
- Network upgrades identified in the generator interconnection process
  - Only projects that have progressed to having executed LGIA that have triggered initiation of projects have been included



- Workbooks of the approved transmission projects, network upgrades and the presentations are posted on the CAISO website under Transmission Development Forum
  - <u>http://www.caiso.com/informed/Pages/MeetingsEvents/UserGroupsRecurringMeetings/Default.aspx</u>
- The workbooks with the project information will continue to be updated on a quarterly basis
- The CAISO will continue to host the Transmission Development Forum on a quarterly basis to provide an opportunity to present changes in the status of projects



# Project Information (continued)

- The aggregate MW of interconnection projects requiring the network upgrades has been provided for the PG&E and SCE areas
  - The ISO is continuing to work with SDG&E and VEA/GLW to have this information available with the July transmission development forum



#### **CAISO / CPUC Transmission Development Forum**

#### **GLW / VEA Project Updates**

April 25, 2023

### **GLW/VEA** Area Upgrades in-service date will be determined once the Eldorado substation mitigation plan is identified

Project	Transmission Plan Approved	Expected In-service Date (Oct. 2022 TDF)	Expected In- service Date (Current)
Tie line Phasor Measurement Units	2017-2018	Dec. 2022	Sept. 2023
GLW/VEA Area Upgrades	2021-2022	TBD	TBD

### Completion of the RAS projects is now expected mid-2023 due to timing of generation project

Network Upgrade Projects	<b>Networ</b>	<u>k U</u>	<b>Ipgrade</b>	Pro	<u>jects</u>
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Project	Study	Туре	Expected In- service Date (Oct 2022 TDF)	Expected In- service Date (Current)
Trout Canyon - Sloan Canyon 230kV line upgrade	2021 Reassessment	LDNU	Dec. 2025	Dec. 2025
Innovation RAS	C8 Phase II	RNU	Nov. 2022	Jul. 2023
Innovation RAS (VEA- GLW portion)	C9 Phase II	RNU	Nov. 2022	Jul. 2023
Sloan Canyon RAS (VEA-GLW portion)	C9 Phase II	RNU	Nov. 2022	Jul. 2023

### Q2 2023 Transmission Development Forum (TDF) Approved Transmission Planning Projects and Queue Network Upgrades *Changes in In-Service Dates from Q1 2023 TDF* April 25<sup>th</sup>, 2023



### Approved Transmission Planning Projects<sup>1</sup>

No.	Project	Transmission Plan Approved	ISD <sup>2</sup> at Approval in Transmission Plan	Expected ISD Q1 2023 TDF	Current Expected ISD	Project Status	Expected CPUC Permit Filing	Expected Construction Start
1	Method of Service for Wildlife 230/66 kV Substation	2007	2009	Oct-2027	Dec-2028 <sup>3</sup>	Design	Apr-2015	May-2024
2	Laguna Bell - Mesa No. 1 230 kV Line Rating Increase Project	2021-2022	2023	Apr-2024	May-2024	Design	Pending	Nov-2023
3	Barre 230 kV Switchrack Conversion to BAAH	2022-2023	2026	Pending	Jun-2026	Design	N/A	May-2025
4	Tie line PMUs	2017-2018	2020	Dec-2025	Feb-2024	Construction	N/A	Construction started

1: Only the projects with changed in-service date or a major change in status (e.g., New, Cancelled, or Completed) are shown. Workbooks of all the approved transmission projects are posted on the CAISO website under Transmission Development Forum.

2: In-service date (ISD).

3: Best estimate given request by City of Riverside to place project on hold.

### Queue Network Upgrades<sup>1</sup>

No.	ID	Network Upgrades	Status	Current Expected Construction Start	Expected CPUC Application	Original Estimated ISD <sup>2</sup>	Expected ISD Q1 2023 TDF	Current Estimated ISD	Aggregate MW in Queue with Executed LGIA
1	SCE-C9C10-N	Windhub AA Bank CRAS - monitoring infrastructure	Construction	Jun-22	N/A	Nov-22	Mar-23	Apr-2023	1,800
2	SCE-C11P2-N-L1	Pardee – Pastoria – Warne 220 kV T/L Rating Increase	Design	Apr-2023	N/A	Oct-2022	Apr-2024 <sup>3</sup>	Jun-2023	110
3	SCE-C12P2-N-R3	Moorpark CRAS: monitoring infrastructure	Design	Pending	N/A	Jul-2024	Jul-2024	Pending <sup>4</sup>	635
4	SCE-C10P2-E-R3	WOCR CRAS Inland/Devers Extension – Monitoring Infrastructure	Construction	Jan-2021	N/A	Oct-2021	Jun-2023	Sep-2023⁵	3,688

1: Only the network upgrades with changed in-service date or a major change in status (e.g., New, Cancelled, or Completed) are shown. Workbooks of all the network upgrades are posted on the CAISO website under Transmission Development Forum.

2: In-service date (ISD)

3: Apr-2024 date provided in Jan2023 TDF was for larger scope of work.

4: On-hold due to delays in associated project.

5: Revised ISD due to CRAS resources and outage constraints. Combining CRAS testing with other projects that are completed later than expected.



**Transmission Development Forum** 

**Project Updates** 

April 25<sup>th</sup>, 2023



### **Status – Network Upgrades**

- This status update covers upgrades required for projects that have LGIA and are moving forward with construction activities.
- TPP-approved projects in the SDG&E area have not been identified as Precursor Network Upgrades (PNU).

No.	ID	Network Upgrades	Status	Original In-service Date	Estimated In-service Date Q3 2022 TDF	Current Estimated In- service Date	Comments
1	SDGE-C07-PHI-RNU-01	Darticipate in the proposed BAS to protect			23-Jun 23-Jun	23-Jun	CEC RAS will address previously identified RNUs.
	SDGE-C08-PHII-RNU-04	TL23006/TL23010/TL23002 San Luis Rey –	In design	n 23-Jun			
	SDGE-PRE-AMEND-RNU-01.2	San Onoire 230kv lines					
2	SDGE-C06-PHII-RNU-03.1	TL680 OLS	In design	24-Jun	24-Jun	24-Jun	Overload Scheme to protect TL680C. Previously named as TL684 RAS.





# **Transmission Development Forum**

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





## **Presentation Summary**

- PG&E fully supports the Transmission Development Forum to share Generation Triggered Reliability and Deliverability project status to all stakeholders.
- PG&E workbooks capturing Generator Interconnection Projects (GIP) and Transmission Planning Process (TPP) project statuses. The Excel Workbook contains projects that have been triggered by Interconnection Agreements while it may not show upgrades not yet triggered by an interconnection agreement.
- 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.



### PG&E Projects Status Summary TPP Projects with Improvements

Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
ТРР	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 and replace structure, if necessary. Replace limiting terminal equipment at Kasson sub.	In-Flight	8/16/2023	10/2/2026	11/22/2023	Q2: Improved ISD. Transmission Planning (TP) and Operations Engineering (OE) requested earliest completion of this project to address normal overload issues on the Schulte-Kasson-Manteca 115kV Line which occurred in 2020.
ТРР	Red Bluff-Coleman 60 kV Reinforcement This project proposes to reconductor the Coleman-Red Bluff 60 kV line.	In-Flight	7/7/2025	11/19/2031	3/30/2029	Q2: Improved ISD, received 2024 funding to order materials (and avoid re- design), so that Phase 1 construction can start in 2025 as requested by TP.
ТРР	Vaca Dixon-Lakeville 230 kV Corridor Series Compensation The project scope is to install about 78 modular power flow control systems deployed on a dedicated bank structure at Vaca Dixon Substation (or adjacent property). Further scoping activities will finalize the substation location(s) to address potential new line overloads. The CAISO recently approved this project in their 2017-2018 Transmission Plan.	In Flight	3/28/2025	5/8/2026	10/20/2025	Q2: Improved ISD. Project still on hold. No PM assigned.
ТРР	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	1/2/2024	7/31/2025	5/1/2025	Q2: improvement will facilitate coordinating this work with Distribution Bank project which depends on completion of the Vierra project.



### PG&E Projects Status Summary TPP Projects with Delays (3+ months)

Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
ТРР	Round Mountain 500 kV Dynamic Voltage Support This project will support connection of the new 500kV substation between Round Mountain (RM) and Table Mountain (TM) Substations to the PG&E system.	In-Flight	6/12/2023	6/3/2024	10/2/2024	Q2-2023: schedule/construction sequencing date adjustments.
TPP C11P2-GP01	Moraga-Castro Valley 230 kV Line Capacity Increase Project The project scope of work involves upgrading the limiting substation equipment (jumper conductors and wave traps) on the Moraga-Castro Valley and Castro Valley-Newark 230 kV lines to utilize their full conductor ratings.	In-Flight	8/9/2024	6/20/2024	10/25/2024	Q2-2023: schedule/construction sequencing date adjustments.
TPP C11P2-NC01	Tesla Substation 230 kV bus section D and circuit breakers 372, 382 and 842 overstress (reactors) TESLA_230KV BUS REACTORS C – D Increase Tesla Substation 230 kV series bus reactors between bus section C and D and D and E	In-Flight	6/13/2023	12/19/2023	3/29/2024	Q2 2023: In construction. Schedule/construction sequencing date adjustments. On track to planned In-service date.



### PG&E Projects Status Summary TPP Projects with Delays (6+ months)

Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
TPP see C12P1- GCR01	Oakland Clean Energy Initiative (MORAGA 115KV BUS UPGRADE & BK 3 SW) The project will install two bus-sectionalizing circuit breakers and one bus-tie breaker on the 115 kV buses at Moraga Substation, which will improve the reliability and operational flexibility of the buses. Operational: The project will also replace Bank 3 115kV switches 771, 773, 777, 779, 791, 793, & 795 which will improve the reliability and operational flexibility of the buses.	In-Flight	11/16/2021	10/30/2023	4/1/2025	Q2-2023: Moraga 115 kV Bus Upgrade delayed due to reprioritization and clearance constraints. Moraga Bank 3 SW replacement operational 6/30/22.
ТРР	Pittsburg 230/115 kV Transformer Capacity Increase This project proposes to add a third Pittsburg 230/115 kV Transformer with a rating of 420 MVA. Completion of this project will provide adequate transmission capacity to enable safe and reliable electric service to electric customers served by Pittsburg Substation	In-Flight	4/8/2025	1/29/2025	6/17/2026	Q2-2023: schedule/construction sequencing date adjustments.
ТРР	Tie line Phasor Measurement Units Install PMUs on CAISO tie-lines with other Balancing Authorities (BAs) at approximately fifteen substations to monitor frequency response and facilitate compliance with NERC BAL-003 and other standards.	In-Flight	6/30/2022	12/1/2026	8/16/2027	Q2-2023: Delay due to reprioritization. Program consists of 9 individually managed projects.



### PG&E Projects Status Summary TPP Projects with Delays (6+ months)

Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
TPP	Estrella Substation Project Construct and own the new Estrella 230/70/21 kV Substation and associated transmission line work as defined by the CAISO's Transmission Plan. Construct 230 kV and 70 kV transmission lines to connect the Morro Bay-Gates 230 kV and San Miguel-Paso Robles 70 kV lines via Estrella Substation. Reconductor the southernmost portion of the San Miguel-Paso Robles 70 kV line between Estrella and Paso Robles Substations.	In-Flight	10/24/2024	5/30/2028	7/16/2029	Q2-2023: The delay in getting the PTC will push the FISD.
ТРР	North of Mesa Upgrade (formerly Midway-Andrew 230 kV Project) The Midway – Andrew 230 kV Project proposes to bring a new 230 kV power source into the Central Coast/Los Padres area by constructing new 230 kV transmission line within Kern, San Luis Obispo, and Santa Barbara Counties.	Cancelled	7/15/2026	8/28/2029	10/21/2032	Q2-2023: Pending cancellation per draft CAISO 2022-23 Transmission Plan. CAISO recommends 95 MW storage & spare transformer at Mesa sub.
TPP	Wheeler Ridge Junction Substation Construct and own the new Wheeler Ridge Junction project substation (to be named Casa Loma) including two new 230/115 kV transformers and three 230 kV line terminations. Upgrade existing Wheeler Ridge- Adobe Switching Station and Adobe Switching Station-Lamont 115 kV lines to 230 kV operations. Upgrade existing Kern-Tevis-Stockdale- Lamont and Kern-Tevis-Stockdale 115 kV lines to 230 kV. Rebuild existing idle line that connects Kern-Tevis-Stockdale to Magunden Substation. Reconductor Stockdale 230 kV tap #1 and #2 lines.	In Flight	3/25/2030	10/11/2032	3/28/2034	Q2-2023: Updated ISD reflects approval in Draft CAISO 2023 TPP and current prioritization. Project is scheduled to restart in 2024.

\* Construction start is dependent on design strategy, CPUC permitting, obtaining necessary land / aerial rights, clearance sequence, obtaining necessary construction easements, and access to structures

\*\* In-Service Date is subject to change through the design process as more information becomes available.



Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
GIP C11P2-NR01	Cottonwood Substation 230 kV circuit breakers 232, 242 overstress Replace Cottonwood Substation 230 kV circuit breakers 232, 242 and associated switches/relays	In-Flight	8/19/2024	8/28/2025	3/7/2025	Q2-2023: The lead time for 230kV breakers is now currently 100 weeks and project team is preparing to order long-lead materials. Planned ISD is subject to change once project teams have modified the schedules based on the critical path items.
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	3/5/2024	8/28/2025	1/28/2025	Q2-2023: Current ISD is pending final schedule alignment with two other existing projects (MPAC & Bank 5) at Gold Hill. CB172 will come first in sequence followed by CB142. Design efforts ongoing for related projects.
GIP C12P1-NPT03	Rio Oso Substation 115 kV circuit breakers 412, 422, 482, 522 and 542 overstress Replace Rio Oso Substation 115 kV circuit breakers 412, 422, 482, 522 and 542 and associated switches/relays	In-Flight	6/1/2021	12/31/2024	9/30/2024	Q2-2023: In construction. A recent interconnection project has triggered this for Generation.

\*\* In-Service Date is subject to change through the design process as more information becomes available.



Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
GIP C11P2-ND01 GIP C9P2-N02	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 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	In-Flight	12/15/2025 Project expected to start construction in phases. Sequencing TBD.	2/13/2026	5/25/2026	Q2-2023: Scope has increased from a reconductor to include poles and line replacement. A Complete rebuild is planned. Many factors are to be evaluated in 2023 to determine the permitting and environmental impacts.
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	8/8/2025	5/7/2025	1/16/2026	Q2-2023: Ongoing alternate route coordination with property owners to mitigate schedule, land, and environmental impacts resulting in schedule delays.
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	1/30/2026	1/5/2026	5/7/2026	



Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments	
GIP C12P2-LDNU1	Ripon-Manteca 115 kV Line Reconductor Reconductor Ripon-Manteca 115 kV line 1.51 mi section of 2/0 CU and 0.92 mi 4/0 ACSR (2.43 mi total)	In-Flight	6/26/2028	12/16/2027	9/11/2028	Q2-2023: Scope has increased from a reconductor to include structure and line replacement. A Complete rebuild using 715 AAC conductor is planned. An NOC is expected however space limitations exist to construct replacement structures. If alternatives are required, it could change the permitting situation. A shoofly is being considered to mitigate the need for a higher permit. Many factors are to be evaluated in 2023 to determine the permitting and environmental impacts.	
GIP C12P2-LDNU2	Stanislaus-Melones Sw Sta-Manteca #1 115 kV Line Reconductor Reconductor Stanislaus-Melones Sw Sta-Manteca #1 115 kV line 25.23 miles section of various conductors from 018/115-043/277	In-Flight	6/26/2028	12/16/2027	9/11/2028	Q2-2023: Scope has increased from a reconductor to include structure and line replacement. Half of this line is already known to require only an NOC under a complete rebuild with like for like structures. Permitting requirements for the remaining 12 miles are in development. Many factors are to be evaluated in 2023 to determine the permitting and environmental impacts.	
* Construction start is dependent on design strategy, CPUC permitting, obtaining necessary land / aerial rights, clearance sequence, obtaining necessary construction easements, and access to structures ** In-Service Date is subject to change through the design process as more information becomes available.							



Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments		
GIP C12P2-LDNU3	Bellota-Riverbank-Melones Sw Sta 115 kV Line 115 kV Line Reconductor Reconductor a total of 17 miles of Bellota- Riverbank-Melones SW STA 115 kV Line with 477 ACSS	In-Flight	6/26/2028	12/31/2027	9/11/2028	Q2-2023: Scope has increased from a reconductor to include structure and line replacement. Presently the team is proceeding with a 477 ACSS conductor and evaluating a bundled conductor option to provide more capacity which would not trigger tubular steel pole (TSP) structures and a higher permit. Moving forward with this option could allow like for like structure replacements and help reduce permitting and environmental impacts. PG&E expects a determination on this approach by middle of April. Many factors are to be evaluated in 2023 to determine the permitting and environmental impacts.		
GIP C12P2-LDNU4	Stanislaus-Melones SW STA-Riverbank Jct Sw Sta 115 kV Line Reconductor Reconductor Stanislaus-Melones Sw Sta-Riverbank Jct Sw Sta 115 kV Line 7.53 miles section of various conductors from 000/001-007/043	In-Flight	6/26/2028	12/16/2027	9/11/2028	Q2-2023: Scope has increased from a reconductor to include structure and line replacement. A complete rebuild using 715 AAC conductor is planned. Team expects an NOC however many factors are to be evaluated in 2023 to determine the permitting and environmental impacts.		
* Construction start is dependent on design strategy, CPUC permitting, obtaining necessary land / aerial rights, clearance sequence, obtaining necessary construction easements, and access to structures								



Project No.	Scope	Status	Planned * Const. Start	Previous TDF Report Dated	Planned ** In-Service	Comments
GIP 20rsmt-6	20RSMTRAS-02 (Reliability) to open Bitterwater Sw Sta-Wheeler Ridge #2 230 kV Line for loss of Midway-Bitterwater 230 kV line and overload on the Midway- Wheeler Ridge #1 230 kV line.	In-Flight	5/21/2024	12/31/2023	11/14/2024	Q2-2023: This project has been delayed. Interconnection project has triggered an interim solution which mitigates the need for this RAS to go in-service. This project only impacts deliverability to the connecting project.
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.	Deferred	5/23/2028	3/31/2027	12/7/2028	Q2-2023: In-service date shown aligns with overall new Switching Station construction. Triggering Interconnection Project has suspended for 1-year.
* Construction start	: is dependent on design strategy, CPUC permitting, of	otaining necessary land / a	erial rights, clearance seq	uence, obtaining necessary	v construction easements,	and access to structures



### *Wrap-up* Transmission Development Forum

April 25, 2023

California ISO Public

### Comments

- Comments due by end of day May 9, 2023
- Submit comments to:
  <u>regionaltransmission@caiso.com</u>

