

**PACIFIC GAS AND ELECTRIC COMPANY**  
**Wildfire Mitigation Plans Discovery 2023**  
**Data Response**

PG&E Data Request No.:	SPD_005-Q001		
PG&E File Name:	WMP-Discovery2023_DR_SPD_005-Q001		
Request Date:	May 16, 2023	Requester DR No.:	SPD_PG&E_2023_005
Date Sent:	June 12, 2023	Requesting Party:	Safety Policy Division
DRU Index #:		Requester:	Kevin Miller

**SUBJECT: DATA REQUEST SPD\_PG&E\_2023\_005; DUE MONDAY, JUNE 12, 2023;**  
**SUBJECT: UNDERGROUNDING PROJECT COSTS AND NON-CPUC-REPORTABLE**  
**IGNITION DATA**

**QUESTION 001**

Regarding costs inherent in PG&E's undergrounding grid hardening mitigation initiative projects, used in calculating cost efficiency and project feasibility as described in the 2023-2025 WMP (p. 340 and p. 968), to date and looking forward:

- a. What was the average cost per circuit mile for undergrounding in 2022, 2021, and 2020, in the HFTD, non-HFTD, and territory-wide?
- b. What is the average cost per circuit mile expected in 2023, 2024, and 2025, in the HFTD, non-HFTD, and territory-wide?
- c. For sub-parts a. and b., explain expected, average year-over-year cost changes.

**ANSWER 001**

- a. Please see the following table for average cost per circuit mile for undergrounding, split between base System Hardening undergrounding work and fire rebuild work. All completed undergrounding circuit miles in 2022, 2021, and 2020 are in HFTDs.

Year Completed	Base UG Total Unit Cost (Average in \$M)	Fire Rebuild UG Total Unit Cost (Average in \$M)	Combined UG Total Unit Cost (Average in \$M)
2020	\$6.21	N/A	<b>\$6.21</b>
2021	\$4.16	\$2.21	<b>\$2.29</b>
2022	\$3.48	\$2.16	<b>\$2.77</b>

As shown above, the rebuild costs, particularly the rebuild footprints in the Caldor and North Complex, are more inexpensive per mile than the base system hardening undergrounding projects because of less administrative and operational constraints in these environments (e.g., expedited timelines, accelerated permitting, geographic terrain).

- b. The current forecasted average cost per circuit mile for undergrounding, including Fire Rebuild and Base UG, is \$3.26 million in 2023, \$3.13 million in 2024, and \$2.96 million in 2025. All planned undergrounding projects are in HFTDs or high fire risk areas (HFRAs).
- c. As shown in the responses to subparts a & b, the year-over-year cost has generally decreased, and is expected to further decrease, due to multiple factors as we scale the program, including but not limited to:
- Economies of scale as the program knowledge and familiarity grows with our internal crews, contractors, materials suppliers, designers and many others;
  - Undergrounding process efficiencies through lessons learned;
  - Updating standards for design and construction, such as revising the trench depth and width standard to minimize unnecessary excavation;
  - Waste minimization, such as spoils mitigation (dirt removal and disposal);
  - Packaging work into longer sections of circuits to take advantage of economies of scale in construction;
  - Reducing the cycle time from initial scoping to completion of construction to create efficiencies and expedite execution; and
  - Deploying new and innovative tools, equipment and technologies to safely increase production rates.

Additionally, as part of PG&E's Lean Operating System implemented in early 2021, PG&E's Undergrounding Program has established a Value Stream Mapping (VSM) effort that is focused on identifying areas for lean waste elimination, including optimizing cycle times and saving program costs. The VSM effort analyzes the current state end-to-end process, including how functional areas work together to create value for each other and for customers. Through the effort, we identify areas for process improvements with the objective of eliminating waste and improving efficiency. VSM is an on-going effort that PG&E will continue use to help meet PG&E's declining unit cost targets for the undergrounding program.