Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2024 General Rate Case – Track 3
Application: A.22-05-016
Exhibit: SDG&E-T3-WMPMA-08-E

ERRATA SUPPLEMENTAL WORKPAPERS OF

JONATHAN WOLDEMARIAM

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

(TRACK 3 - WILDFIRE)

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

April 2026

Table of Contents

4. Wildfire Mitigation Strategy Development	Page / Exhibit
a. Summarized Risk Map	4
b. Wildfire-Related Data and Algorithms	8
c. Allocation Methodology Development and Application	12
5. Grid Design, Operations, and Maintenance	
a. Covered Conductor Installation	16
b. Strategic Undergrounding	24
c. Distribution Underbuild	32
d. Distribution Overhead System Hardening	39
e. Microgrids	44
f. Advanced Protection	48
g. Early Fault Detection	52
h. Distribution Communications Reliability Improvements	56
i. Avian Protection Program	65
j. Strategic Pole Replacement Program	69
k. Wireless Fault Indicators	75
l. PSPS Sectionalizing Enhancement Program	78
m. Standby Power Program	81
n. Generator Grant Program	86
o. Generator Assistance Program	90
p. Distribution Overhead Detailed Inspections	See Ex. SDG&E-T3-WMPMA-07
q. Transmission Overhead Detailed Inspections	See Ex. SDG&E-T3-WMPMA-07
r. Distribution Infrared Inspections	See Ex. SDG&E-T3-WMPMA-07
s. Distribution Wool Pole Intrusive Inspections	See Ex. SDG&E-T3-WMPMA-07
t. Drone Assessments	See Ex. SDG&E-T3-WMPMA-07
u. Distribution Overhead Patrol Inspections	See Ex. SDG&E-T3-WMPMA-07
v. Capacitor Maintenance and Replacement Program	94
w. Expulsion Fuse Replacement Program	98
x. Hotline Clamp Replacement Program	101
y. Lightning Arrestor Removal and Replacement	104
z. Cleveland National Forest	107
aa. LiDAR Inspections of Distribution Electric Lines and Equipment	112
bb. Centralized Repository for Data	115
6. Vegetation Management and Inspections	
a. Fuels Management	122
b. Pole Clearing (Brushing)	129
c. Tree Planting – Right Tree Right Place	133
7. Situational Awareness and Forecasting	
a. Weather Stations and NDVI Cameras	138
b. Air Quality Management Program	142
c. Fire Potential Index	145

d. High-Performance Computing Infrastructure	149
8. Emergency Preparedness	
a. Public Emergency Communications Strategy	152
b. Aviation	169
c. Suppression Resources and Services	176
d. Emergency Preparedness Plan	180
9. Community Outreach and Engagement	
a. Community Engagement	185

Workpaper	Wildfire Mitigation Strategy Development
Category	Summarized Risk Map
WMP Tracking ID	WMP.442

Description	**Wildfire Next Generation System (WiNGS) Planning and WiNGS Operations**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	-
Capital Expenditures Non-Labor	-	-	-	-	-
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
Capital Expenditures Indirect Costs	-	-	-	-	-
Capital Total	**-**	**-**	**-**	**-**	**-**
O&M Labor	-	-	0	711	1,267
O&M Non-Labor	-	-	5	1,108	2,790
O&M Direct Costs Subtotal	**-**	**-**	**5**	**1,819**	**4,057**
O&M Indirect Costs	-	-	0	619	547
O&M Total	**-**	**-**	**5**	**2,437**	**4,604**
Units					
	The variety of work activities in this category makes it infeasible to identify a single unit of measurement.				
FTE*	-	-	0.0	5.5	**9.5**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
WMP Risk Assessment					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**-**	**-**	**5**	**1,819**	**4,057**
Labor	-	-	0	711	1,267
Non-Labor	-	-	5	1,108	2,790
WMP Risk Assessment Total	**-**	**-**	**5**	**1,819**	**4,057**

Business Purpose:

The Risk Assessment and Mapping program sought to advance SDG&E's wildfire risk modeling, mapping, and analytical capabilities to support wildfire risk reduction activities across two core operational areas: long term investment planning (Wildfire Next Generation System (WiNGS) Planning) and proactive Public Safety Power Shutoff (PSPS) de-energization decisions during extreme fire weather conditions (WiNGS Operations) where wildfire risk exceeded PSPS risk. The project implemented an upgraded, data driven risk assessment framework that strengthened SDG&E's ability to estimate wildfire likelihood, consequence, and long term risk reductions at a circuit segment level while incorporating site specific conditions such as weather, vegetation, asset characteristics, customer exposure, simulated wildfire spread estimates, and historical PSPS de energization events.

By modernizing the risk models used in WiNGS Planning and WiNGS Operations (Ops), SDG&E improved its understanding of wildfire and PSPS risk and enhanced its ability to quantify mitigation benefits through updated mitigation effectiveness calculations and long term risk reduction estimates. The initiative also delivered interactive visualizations that informed long term grid planning decisions and supported operational deenergization actions during elevated fire weather conditions. In addition, a third party review assessed the model methodology, visualization functionality, usability, scalability, and overall alignment with existing regulatory risk framework expectations, such as the 2023–2025 Wildfire Mitigation Plan Technical Guidelines issued by the Office of Energy Infrastructure Safety, as well as, CPUC decisions regarding the inclusion of Risk Assessment and Mitigation Phase (RAMP) filings.

Completion of this foundational work positioned SDG&E to integrate emerging risk modeling requirements, including the Risk Decision Framework (RDF) requirements, which required enhanced risk prioritization, evaluation of multiple mitigation alternatives, and a transition from Risk Spend Efficiency metrics to Benefit Cost Ratios to evaluate mitigation cost-effectiveness. This program also supported greater transparency, improved documentation, expanded data integration, increased cross utility comparability, and more robust uncertainty quantification. These enhancements enabled the incorporation of scenario analysis, Areas of Continued Improvement (ACI) requirements, and expanded modeling and visualization functionality into both WiNGS Planning and WiNGS Ops, strengthening SDG&E's overall readiness to meet evolving regulatory expectations for comprehensive and defensible wildfire risk modeling.

Internal and external staff supported data development, methodological enhancements, and validation efforts required to satisfy regulatory expectations for mature wildfire risk governance. Ultimately, the program strengthened SDG&E's ability to (1) transparently and consistently quantify wildfire and PSPS risk, (2) prioritize grid hardening mitigations based on risk prioritization and long term cost effectiveness, and (3) demonstrate compliance and ongoing maturity improvements aligned with statewide WMP standards, to provide sufficient model descriptions, assumptions, and data transparency to enable independent reviewers to validate results.

Project Justification:

The Risk Assessment and Mapping program consisted of developing, implementing, and validating enhanced wildfire-risk-modeling capabilities to support SDG&E's planning and operational decision-making processes. The project delivered updated risk modules, spatial mapping layers, and cloud analytical engines integrated into WiNGS-Planning and WiNGS-Ops, enabling circuit-level risk estimation and mitigation-reduction calculations.

The program also included the development of interactive visualization tools for geospatial risk displays, weather-driven scenario analysis, mitigation-effectiveness comparisons, and de-energization decision support. These tools consolidated data from multiple data sources and enabled users to examine wildfire risk under a range of fuel, weather, asset-condition, and ignition-probability conditions. Internal and external teams contributed to data engineering, model development, validation, deployment, monitoring, maintenance, and documentation in alignment with regulatory, ACI, and maturity-model requirements. Independent third-party evaluators assessed the methodology design, visualization usability, system scalability, and overall regulatory alignment.

Project Scope:

The Risk Assessment and Mapping program was created to support SDG&E in maintaining a regulatory compliant, data driven approach to wildfire risk quantification and mitigation prioritization. As required under SDG&E's Wildfire Mitigation Plan, the program strengthened SDG&E's ability to identify high risk areas within its service territory, estimate long term wildfire risk reduction, assess alternative mitigation options, and quantify the benefits of risk reduction investments with greater transparency, consistency, and defensibility. These enhanced analytical capabilities supported CPUC expectations for clear documentation, replicability, and comparability across utilities, all of which are essential for demonstrating prudent investment decisions.

The program also addressed the operational need for improved decision support in long term capital planning and PSPS strategies. Upgraded risk models, spatial layers, and interactive visualizations enabled more accurate mapping of ignition drivers and asset vulnerabilities, while also informing de energization decisions under extreme fire weather conditions. These tools allowed SDG&E to evaluate wildfire risk under varying fuel, weather, and asset condition scenarios assisting with alignment between planning and operational risk reduction activities.

In addition, the program was necessary to prepare SDG&E for emerging regulatory requirements, including enhanced risk prioritization, evaluation of multiple mitigation alternatives, and the transition from Risk Spend Efficiency metrics to Benefit Cost Ratios. The foundational work performed through this program supported improved transparency, expanded data integration, cross utility comparability, and more rigorous uncertainty and sensitivity analysis, all of which are expected components of future CPUC risk modeling reviews.

These enhancements enabled the incorporation of scenario analysis, ACI requirements, and expanded modeling and visualization functionality into both WiNGS Planning and WiNGS Ops, strengthening SDG&E's overall readiness to meet evolving regulatory expectations for comprehensive and defensible wildfire risk modeling. As a result, the program was essential to help the SDG&E risk modeling approach continue to demonstrate compliance, support prudent investment decision making, and achieve meaningful and measurable wildfire risk reduction outcomes.

Cost Drivers:

To support the organization's ability to meet evolving regulatory requirements, the following cost drivers were involved:

- Internal and External personnel support, including staff time dedicated to regulatory analysis, documentation, and ongoing compliance activities.

- Additional external contractor services, such as third-party reviews, mitigation-effectiveness analyses, and the development of future risk-reduction scenarios aligned with WMP regulatory expectations.

- Cloud infrastructure development costs required to meet cybersecurity standards and to enable compliant data management, analytics, and reporting capabilities.

Project Timing and Phases:

While the work described here occurred during the 2023 period, SDG&E recognizes that many of these activities remain ongoing. This continuation is driven by the evolving nature of risk-related regulatory requirements, enhancements to modeling frameworks, and stakeholder feedback. These factors, combined with SDG&E's commitment to meeting regulatory expectations through its culture of continuous improvement, necessitate the continued refinement and expansion of this work.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, internal labor, and contract labor necessary to complete the work.

Procurement activities were conducted in accordance with SDG&E's existing contracting and vendor management procedures. External technical partners were selected through competitive solicitations or pre qualified contracting pathways to provide specialized expertise in data engineering, system modernization, cloud migration, and other services necessary to implement updated regulatory requirements. All engagements were formalized through purchase orders and statements of work that clearly defined deliverables, oversight roles, acceptance criteria, and timelines.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 6.7. This program does not have specified targets. Planned Capital spend was $319,000, planned O&M spend was $3,597,000.

Risk Identification and Mitigation:

This program does not present Risk Spend Efficiency (RSE) metrics because it is considered a foundational activity that does not directly reduce risk on its own. Instead, it provides the analytical, technical, and informational groundwork necessary for the development of effective wildfire mitigation and PSPS related strategies. SDG&E's understanding of wildfire and PSPS risks, and its ability to design potential mitigations tailored to site specific conditions, system characteristics, and operational constraints, depends on the work performed under this initiative. As a result, the value of the program is realized through its critical role in enabling accurate risk modeling, informed decision making, and the identification of future mitigation opportunities.

Consideration of Alternative Solutions:

Do Nothing: This option was not considered by SDG&E, as the work is required to meet regulatory and compliance obligations.

If SDG&E had chosen not to invest or underinvest in this area, the following outcomes could have occurred:
- More frequent and larger numbers of customers de energized during PSPS events under extreme fire weather conditions.
- Deployment of ineffective or misaligned strategies due to inaccurate data or outdated risk models, which could result in mitigation plans that do not accurately reflect current fire-weather conditions, system performance, hazard exposure, or community vulnerability. This may lead to strategies that either over- or under-estimate risk, allocate resources inefficiently, or fail to target the areas of highest need.
- Loss of trust and reputational standing with regulators and the public due to an inability to clearly explain and defend wildfire and PSPS related strategies using data-driven, reasonable methodologies.
- Reduced ability to identify emerging risks or adjust mitigation strategies in response to evolving environmental or system conditions.
- Delays in implementing future risk related requirements (e.g., Benefit Cost Ratios) and mitigation programs that depend on accurate modeling, resulting in slower overall risk reduction progress.

Coordination with Similar Programs

The Risk Assessment and Mapping (WMP.442) program should be evaluated in the context of, and in coordination with, the following related programs:
- Wildfire-Related Data and Algorithms (WMP.521)
- Allocation Methodology Development and Application (WMP.523)
- Centralized Repository for Data (WMP.519)

Workpaper	Wildfire Mitigation Strategy Development
Category	Wildfire-Related Data and Algorithms
WMP Tracking ID	WMP.521

Description	**WMP Data Governance: Wildfire-Related Data and Algorithms**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	-
Capital Expenditures Non-Labor	-	-	-	-	-
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
Capital Expenditures Indirect Costs	-	-	-	-	-
Capital Total	**-**	**-**	**-**	**-**	**-**
O&M Labor	-	-	9	511	704
O&M Non-Labor	-	-	7	794	1,056
O&M Direct Costs Subtotal	**-**	**-**	**16**	**1,305**	**1,760**
O&M Indirect Costs	-	-	7	437	283
O&M Total	**-**	**-**	**22**	**1,743**	**2,043**
Units					
Units Description	The variety of work activities in this category makes it infeasible to identify a single unit of measurement.				
FTE*	-	-	0.1	4.0	**5.3**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					532

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
WMP Data Governance					
Capital	-	-	-	-	-
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**-**	**-**	**16**	**1,305**	**1,760**
Labor	-	-	9	511	704
Non-Labor	-	-	7	794	1,056
WMP Data Governance Total	**-**	**-**	**16**	**1,305**	**1,760**

Business Purpose:

The Wildfire Related Data and Algorithms (WMP.521) program aimed to establish SDG&E's enterprise wide wildfire and Public Safety Power Shutoff (PSPS) risk reduction framework by creating and supporting long term grid hardening planning and operational situational awareness through a data driven, community focused strategy. The project implemented a unified wildfire and PSPS related risk mitigation strategy based on risk modeling, and analytics that produced repeatable, automated, and defensible risk metrics aligned with existing regulatory frameworks.

By integrating asset information, mitigation effectiveness data, ignition probability modeling, weather driven historical and forecasted conditions, and consequence assessments, SDG&E enhanced the precision and transparency of both its long term grid hardening planning and operational wildfire risk decisions. This integration resulted in: (1) stronger alignment between long term capital investments and modeled risk reduction performance; (2) data driven support for de energization decisions under extreme fire weather conditions by quantifying wildfire risk and comparing it against PSPS related risk; and (3) consistent, transparent, and standardized reporting through the WiNGS Planning and WiNGS Ops risk model frameworks.

The program also established the analytical foundation for a data driven strategy based on repeatable, automated, and defensible metrics, including a creation of multiple dashboards that highlighted ignition reduction performance and hardening activity KPIs relative to targets.

As a result of this foundational work, SDG&E was prepared to shape a risk based, data-driven grid hardening strategy through its Wildfire Next Generation System (WiNGS) (WiNGS Planning and WiNGS Operations) risk models that informed long term strategy, operational reporting, and de-energization decisions during extreme fire weather events.

Project Justification:

The Wildfire-Related Data and Algorithms (WMP.521) program consisted of developing a data driven strategy supported by relevant metrics, advanced risk modeling components, and decision support tools needed to quantify wildfire risk and evaluate the implementation and progress of mitigation activities. Core elements included:

- Wildfire risk algorithms creation, validation, deployment and maintenance of risk models in cloud environments that estimated ignition likelihood, fire spread potential, and customer/public safety impacts, forming the backbone of SDG&E's wildfire risk strategy.

- Analytical tools such as interactive dashboards that quantified risk reduction and across mitigation alternatives (e.g., covered conductor, strategic undergrounding, inspection activities, vegetation management), enabling comparable evaluation using standardized wildfire risk units. These tools were displayed and maintained through dashboards where key metrics, risk scores, and mitigation impacts were visualized to support informed, actionable decision making.

- Model documentation, version control, testing evidence, and traceability packages for all outputs were repeatable, defensible, auditable, and aligned with regulatory expectations.

- Formal integration with WiNGS Planning and WiNGS Ops, enabling long term grid hardening prioritization and operational risk scoring to support PSPS preparedness and situational awareness during evolving meteorological conditions.

Collectively, these components created a unified analytical framework that provided wildfire risk estimates used for long term planning and operational decision making were accurate, repeatable, auditable, and defensible. This integrated framework drove long-term grid hardening planning, enabled consistent evaluation of mitigation progress, and strengthened operational decision making under evolving fire weather conditions.

Project Scope:

The Wildfire Related Data and Algorithms (WMP.521) program was needed to establish a rigorous, transparent, and defensible foundation for SDG&E's long term grid hardening and wildfire risk reduction strategy. This effort supported a unified analytical framework capable of linking asset data, mitigation effectiveness, and wildfire risk modeling into a consistent and auditable basis for investment and operational decisions. The program delivered the metrics, risk evaluation methods, and analytical discipline required to justify both grid hardening investments and PSPS operational actions using standardized data and risk based evaluations.

Through this work, SDG&E was able to prioritize grid hardening investments using measurable, repeatable, and automated metrics tied to ignition reduction potential and hardening activity KPIs, guiding mitigation selections aligning with modeled risk reduction outcomes. The program also strengthened operational decision making through WiNGS Ops risk models, which quantified wildfire risk relative to PSPS risk and informed de energization decisions during extreme fire weather conditions. In addition, SDG&E was able to quantify mitigation benefits using consistent wildfire risk units and compare alternatives through automated dashboards that produced accurate, repeatable, auditable, and defensible results. The program allowed SDG&E to produce transparent, defensible, and risk based strategies across both planning and operations, and enabled the development of a robust, data driven long term grid hardening strategy grounded in quantifiable risk reduction and standardized analytical methods. Building on this foundation, SDG&E was positioned to expand its use of WiNGS Planning to shape a cost effective, risk informed long term grid hardening portfolio and to provide a unified analytical basis for capital planning, cost recovery, and mitigation sequencing across the service territory.

Cost Drivers:

To support the organization's ability to meet evolving regulatory requirements, the following costs were incurred:

- SDG&E hired employees and devoted the time of existing employees Ito regulatory analysis, documentation, and ongoing compliance activities.

- SDG&E hired contractors, such as dashboard developers and specialized teams confirming that WMP filings and related work are aligned with WMP and other regulatory expectations.

- Development costs for the internal dashboard required to transparently and consistently track Wildfire and PSPS metrics, such as ignition counts by driver and program mitigation progress, while also meeting cybersecurity standards and enabling compliant data management, analytics, and reporting capabilities.

Project Timing and Phases:

Given the iterative nature of these activities, SDG&E did not maintain a fixed monthly or quarterly progress dashboard. The tasks were carried out throughout the year on a responsive and adaptive basis, with specific components completed at different times as requirements evolved and internal quality reviews were conducted. Within a continuous improvement environment, elements of the work are consistently refined and updated as new information, regulatory guidance, and operational insights emerge. Because the work progresses through ongoing cycles of refinement rather than through a linear sequence of milestones, a static timeline or dashboard would not accurately capture the dynamic nature of the effort.

While the work described happened in the 2023 period, SDG&E recognizes that many of these activities remain ongoing. This continuation is driven by the evolving nature of risk-related regulatory requirements, improvements in the modeling frameworks, and stakeholder feedback. This work reflects SDG&E's ongoing commitment to compliance and its broader culture of continuous improvement

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, internal labor, and contract labor necessary to complete the work.

Procurement activities were conducted in accordance with SDG&E's existing contracting and vendor management procedures. External technical partners were selected through competitive solicitations or pre qualified contracting pathways to provide specialized expertise in data engineering, system modernization, cloud migration, and other services necessary to implement updated regulatory requirements. All engagements were formalized through purchase orders and statements of work that clearly defined deliverables, oversight roles, acceptance criteria, and timelines.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 6.7. This program does not have specified targets.

Risk Identification and Mitigation:

This program does not present Risk Spend Efficiency (RSE) metrics because it is considered a foundational activity that does not directly reduce risk on its own. Instead, it provides the analytical, technical, and informational groundwork necessary for the development of effective wildfire mitigation and PSPS related strategies. SDG&E's understanding of wildfire and PSPS risks, and its ability to design potential mitigations tailored to site specific conditions, system characteristics, and operational constraints, depends on the work performed under this initiative. As a result, the value of the program is realized through its critical role in enabling accurate risk modeling, informed decision making, and the identification of future mitigation opportunities.

Consideration of Alternative Solutions:

Alternative solutions, such as relying solely on existing legacy tools, ad hoc analyses, or manual risk tracking processes, were considered but ultimately determined insufficient to meet regulatory expectations for transparency, repeatability, and defensibility. These approaches lacked the ability to consistently integrate ignition modeling, weather driven variability, and mitigation effectiveness into unified, auditable risk metrics. Therefore, the development of an enterprise wide analytical framework and automated risk modeling capability was deemed necessary to provide accurate, standardized, and compliant wildfire and PSPS decision support.

Coordination with Similar Programs

The Wildfire Related Data and Algorithms (WMP.521) program should be evaluated in the context of, and in coordination with, the following related programs:

- Risk Assessment and Mapping (WMP.442)
- Allocation Methodology Development and Application (WMP.523)
- Centralized Repository for Data (WMP.519)

Workpaper	Wildfire Mitigation Strategy Development
Category	Allocation Methodology Development and Application
WMP Tracking ID	WMP.523

Description	**Allocation Methodology Development and Application**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	28	55	69
Capital Expenditures Non-Labor	-	-	1,628	2,578	1,092
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**1,657**	**2,634**	**1,161**
Capital Expenditures Indirect Costs	-	-	40	215	118
Capital Total	**-**	**-**	**1,696**	**2,849**	**1,279**
O&M Labor	93	1,796	1,543	957	1,368
O&M Non-Labor	140	1,923	3,736	3,009	4,264
O&M Direct Costs Subtotal	**233**	**3,719**	**5,279**	**3,966**	**5,632**
O&M Indirect Costs	78	1,345	1,120	844	487
O&M Total	**311**	**5,065**	**6,399**	**4,810**	**6,119**
Units					
	The variety of work activities in this category makes it infeasible to identify a single unit of measurement.				
FTE*	0.8	14.5	12.4	8.7	**12.8**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					1,383

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Wildfire Mitigation Department					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**233**	**3,719**	**5,279**	**3,966**	**5,632**
Labor	93	1,796	1,543	957	1,368
Non-Labor	140	1,923	3,736	3,009	4,264
Wildfire Mitigation Department Total	**233**	**3,719**	**5,279**	**3,966**	**5,632**
WMP Elec. Dist. Asset Investment Prioritization					
Capital	**-**	**-**	**1,657**	**2,003**	**(59)**
Labor	-	-	28	49	11
Non-Labor	-	-	1,628	1,954	(69)
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
WMP Elec. Dist. Asset Investment Prioritization Total	**-**	**-**	**1,657**	**2,003**	**(59)**
Investment Portfolio Optimization WMP					
Capital	**-**	**-**	**-**	**631**	**1,220**
Labor	-	-	-	7	58
Non-Labor	-	-	-	624	1,162
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Investment Portfolio Optimization WMP Total	**-**	**-**	**-**	**631**	**1,220**
Total	**233**	**3,719**	**6,936**	**6,600**	**6,793**

Business Purpose:

Wildfire Mitigation Department:
The Allocation Methodology Development and Application (WMP.523) program aimed to establish a validated and repeatable asset data and wildfire risk modeling foundation that supported SDG&E's ongoing and future wildfire and Public Safety Power Shutoff (PSPS) risk modeling activities, as well as tabular and geospatial data sharing regulatory requirements. The initiative addressed regulatory expectations to transparently share current electrical asset status and to demonstrate both the advancement and completeness of wildfire mitigation programs, as required under the 2023–2025 Wildfire Mitigation Plan Technical Guidelines issued by the Office of Energy Infrastructure Safety, which mandate that electrical corporations employ a risk informed approach in developing their WMPs. The program implemented a unified asset data platform and a suite of auditable methodologies that integrated, consolidated, validated, and enhanced diverse datasets, including asset attributes, geospatial information, weather, outages, operating history, and other critical information, to enable automated, accurate, and transparent asset reporting, both internally and externally, as well as defensible risk quantification and decision support consistent with Wildfire Mitigation Plan (WMP) requirements. This work was designed as a foundational and scalable data driven strategy anchored in curated, consumable, and defensible information products.

By consolidating diverse data sources into a governed platform and embedding curated asset data into Wildfire Mitigation Plan (WiNGS) Planning and WiNGS Operations (Ops) risk models, SDG&E improved the accuracy, repeatability, and auditability of ignition likelihood estimates, fire spread potential assessments, and customer and public safety impact evaluations. The initiative was critical in meeting regulatory requirements and in advancing SDG&E's risk models into probabilistic and machine learning frameworks capable of accurately capturing the relationship between wind gust intensity and failure rates, which enabled SDG&E to successfully accommodate Benefit-Cost risk-Based Decision-Making Framework (RDF) modeling requirements, like tail analysis, risk aversion, and sensitivity analysis. SDG&E used, and continues to use, these evaluations to shape long term grid hardening planning and to guide operational decision-making during extreme fire weather conditions.

Cross functional partnerships among Asset Management, Enterprise Risk Management, the Wildfire Mitigation Program, and source system owners continuously improved data quality to align with regulatory requirements that extended beyond the WMP. As a result of this foundational work, SDG&E enhanced risk informed decision making and was positioned to shape a risk based, cost effective grid hardening strategy supported by WiNGS Planning. Collectively, these efforts strengthened transparency in prioritization, reinforced compliance evidence, and improved the defensibility of investment and operational decisions.

Project Justification:

The Allocation Methodology Development and Application (WMP.523) program consisted of:
- Creation of a data foundation, which identified, consolidated, and organized diverse enterprise and field data into a single platform through repeatable, auditable, and defensible data engineering pipelines;

- Curation of asset attributes and indicators into consumable, quality controlled datasets embedded within enterprise risk models and core business processes;

- Development, validation, deployment, and maintenance of wildfire risk algorithms and cloud based models used to estimate ignition likelihood, fire spread potential, and consequences to customers and public safety;

- Establishment of advanced modeling architectures featuring automated testing and validation routines, model monitoring controls, secure and scalable cloud deployment capabilities, and full traceability of model assumptions and inputs;

- Integration with WiNGS Planning and WiNGS Ops, enabling long term strategy development, reporting, and operational decision support, including PSPS de energization decision making during extreme fire weather conditions.

The program also incorporated independent research and compliance activities, including insights from Electric Power Research Institute (EPRI) studies and findings from the Independent Evaluator Review, and used this information to inform and shape continuous data reporting and quality improvements across initiatives.

The work relied on both internal and external labor resources for development, implementation, and sustained support, as data to cloud migration, construction of advanced wildfire risk models, integration of curated asset data into enterprise platforms, and continuous validation, monitoring, and refinement required significant time, specialized engineering and data science expertise, and coordinated cross functional effort.

Project Scope:

The Allocation Methodology Development and Application (WMP.523) program was needed to meet regulatory expectations for transparent, risk based planning and to provide a defensible analytical foundation consistent with SDG&E's wildfire and PSPS obligations. Wildfire regulatory requirements increasingly emphasized the need for validated, repeatable, and auditable risk modeling practices; clear demonstration of program advancement; and accurate tabular and geospatial asset reporting. Prior to this initiative, SDG&E did not have a unified, enterprise scale asset data framework or a fully integrated modeling architecture capable of supporting the level of transparency, accuracy, and traceability required for WMP, PSPS, and related regulatory reviews.

The program was necessary to integrate and curate diverse datasets, such as asset condition, geospatial information, weather, outages, and operating history, into a single governed platform capable of reliably supporting ignition likelihood modeling, fire spread analysis, and customer impact assessments. This foundation was essential to transition SDG&E's risk models toward probabilistic and machine learning approaches that accurately represented wind driven failure dynamics and supported Benefit Cost RDF modeling requirements, including tail analysis, risk aversion, and sensitivity testing. Without this work, SDG&E would not have met the increasing analytical rigor expected in regulatory proceedings or demonstrated the defensibility of its wildfire mitigation and grid hardening strategies.

The initiative also addressed compliance expectations for transparent data governance and cross functional alignment. The program enabled consistent, high quality information flows across Asset Management, Enterprise Risk Management, the Wildfire Mitigation Program, and source system teams, allowing for asset data, risk inputs, and model outputs to be accurate, complete, and traceable. These capabilities directly supported WMP requirements for data quality, continuous improvement, and public and regulatory reporting of asset status and wildfire risk metrics.

By establishing reliable data pipelines, advanced modeling architectures, and cloud based computational environments, the program enabled SDG&E to maintain model performance during extreme fire weather conditions, rapidly update assumptions as new information became available, and demonstrate auditable, defensible analytical outputs during regulatory evaluation. The work also assisted SDG&E's long term grid hardening plans and operational decision making processes, including PSPS de energizations, were based on quantifiable, risk informed insights aligned with regulatory expectations.

Collectively, the program was needed to strengthen the transparency, accuracy, and defensibility of SDG&E's wildfire risk assessments, support prudent investment prioritization, and demonstrate compliance with evolving regulatory requirements.

Cost Drivers:

To support the organization's ability to meet evolving regulatory requirements, the following cost drivers were involved:

- Internal and external personnel support, including staff time for regulatory analysis, documentation, ongoing compliance activities, and coordination across Asset Management, Enterprise Risk Management, and other groups across SDG&E.

- External contractors were hired that were responsible for developing the platform, executing quality assurance/control processes, and supporting complementary efforts such as Independent Evaluator reviews and Electric Power Research Institute (EPRI) research studies necessary to align with WMP regulatory expectations.

- Ongoing monitoring, validation, and maintenance to confirm model accuracy, data quality, and sustained compliance with evolving WMP and PSPS requirements.

- Cloud infrastructure costs for secure, scalable data storage, model execution, and compliance driven cybersecurity controls.

Project Timing and Phases:

While the work described happened in the 2023 period, SDG&E recognizes that many of these activities remain ongoing. This continuation is driven by the evolving nature of risk related regulatory requirements, improvements in the modeling frameworks, and stakeholder feedback. This work reflects SDG&E's ongoing commitment to compliance and its broader culture of continuous improvement.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, internal labor, and contract labor necessary to complete the work.

Procurement activities were conducted in accordance with SDG&E's existing contracting and vendor management procedures. External technical partners were selected through competitive solicitations or pre qualified contracting pathways to provide specialized expertise in data engineering, system modernization, cloud migration, and other services necessary to implement updated regulatory requirements. All engagements were formalized through purchase orders and statements of work that clearly defined deliverables, oversight roles, acceptance criteria, and timelines.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 7.1.3. This program does not have specified targets. Planned Capital spend was $5,277,000, planned O&M spend was $5,291,000.

Risk Identification and Mitigation:

This program does not present Risk Spend Efficiency (RSE) metrics because it is considered a foundational activity that does not directly reduce risk on its own. Instead, it provides the analytical, technical, and informational groundwork necessary for the development of effective wildfire mitigation and PSPS related strategies. SDG&E's understanding of wildfire and PSPS risks, and its ability to design potential mitigations tailored to site specific conditions, system characteristics, and operational constraints, depends on the work performed under this initiative. As a result, the value of the program is realized through its critical role in enabling accurate risk modeling, informed decision making, and the identification of future mitigation opportunities.

Consideration of Alternative Solutions:

SDG&E evaluated alternative approaches prior to developing and implementing the Allocation Methodology Development and Application (WMP.523) program. However, none of these alternatives were capable of meeting the transparency, accuracy, repeatability, and compliance expectations required under the WMP and PSPS regulatory frameworks.

Do Nothing: Specifically, existing legacy systems, manual processes, and distributed data management were evaluated. But none of those options could not meet SDG&E's WMP requirements for data quality, repeatability, auditability, or scalable tabular and geospatial reporting.

Off-the-shelf: Off-the-shelf risk models were considered but lacked the transparency, customization, and traceability needed to reflect SDG&E's asset configurations and operational history for wildfire modeling.

Coordination with Similar Programs

The Allocation Methodology Development and Application (WMP.523) program should be evaluated in the context of, and in coordination with, the following related programs:

- Wildfire Related Data and Algorithms (WMP.521)
- Risk Assessment and Mapping (WMP.442)
- Centralized Repository for Data (WMP.519)

Workpaper	Grid Design, Operations, and Maintenance
Category	Covered Conductor Installation
WMP Tracking ID	WMP.455

Description	**Covered Conductor Installation**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	0	254	1,800	7,245	4,960
Capital Expenditures Non-Labor	1,486	671	19,967	72,256	~~20,658~~ 50,649
Capital Expenditures Direct Costs Subtotal	**1,486**	**925**	**21,767**	**79,501**	~~**25,618**~~ **55,610**
Capital Expenditures Indirect Costs	4	233	3,614	17,905	5,303
Capital Total	**1,491**	**1,158**	**25,381**	**97,407**	~~**30,922**~~ **60,913**
O&M Labor	-	1	21	259	457
O&M Non-Labor	-	22	497	2,962	2,916
O&M Direct Costs Subtotal	**-**	**24**	**517**	**3,221**	**3,372**
O&M Indirect Costs	-	-	18	170	203
O&M Total	**-**	**24**	**535**	**3,390**	**3,575**
Units					
Miles*			21	61	~~**50**~~ **47**
FTE**	0.0	2.0	14.0	55.6	**34.3**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Covered Conductor Installation					
Capital	**1,486**	**925**	**21,767**	**79,501**	~~**25,618**~~ **55,610**
Labor	0	254	1,800	7,245	4,960
Non-Labor	1,486	671	19,967	72,256	~~20,658~~ 50,649
O&M	**-**	**24**	**517**	**3,221**	**3,372**
Labor	-	1	21	259	457
Non-Labor	-	22	497	2,962	2,916
Covered Conductor Installation Total	**1,486**	**949**	**22,284**	**82,722**	~~**25,622**~~ **55,613**

Business Purpose:

Since its inception in 2020, the SDG&E Covered Conductor (CC) Hardening Program (WMP.455) has replaced bare conductors with covered conductors in High Fire Threat Districts (HFTD). Covered conductors are manufactured with an internal semiconducting layer and external ultraviolet (UV) resistant insulating layers, providing incidental contact protection from sources such as vegetation and wire to wire contact. Covered conductors mitigate wildfire ignition risk by reducing the potential of ignition from foreign objects and wire to wire contact.

SDG&E's CC Hardening Program applies rigorous engineering standards, high quality materials, and proven design practices to enhance the resilience of the distribution system against Santa Ana wind, extreme heat and severe winter storms conditions that have historically driven catastrophic wildfires. Overall, the program represents a prudent, risk based investment in public safety and system reliability, and aligns with SDG&E's WMP targets.

Project Justification:

Expected outcomes of Covered Conductor installation are the mitigation of equipment failure and ignition. SDG&E estimates that covered conductor is approximately 62% effective at mitigating against these risk drivers. SDG&E's 2023 CC Hardening Program demonstrated thoughtful investment and measurable effectiveness in wildfire risk mitigation. SDG&E applied a rigorous framework grounded in independent testing and documented performance standards, providing both prudent spending and reliable maintenance.

• Ignition Reduction: Effectiveness analysis and third-party utility testing confirmed that CC installations are up to 100% effective in preventing arcing and ignition during phase-to-phase contacts at rated voltage. The insulated conductor system also significantly lowers the risk of ignitions caused by vegetation and object contact.

• Targeted Impact: The program's risk-driven prioritization resulted in strategic deployment, with most installations concentrated on the most vulnerable segments, maximizing wildfire risk reduction per dollar spent.

• PSPS Reduction: CC installations allow for higher wind speed thresholds (50 mph versus 45 mph for bare conductors), directly supporting SDG&E's Wildfire Mitigation Plan (WMP) objectives to minimize PSPS events and their impacts on customers and communities.

• Fire hardening through structural and conductor upgrades: Replacing wood poles with steel poles during the installation of covered conductor significantly improves system durability because steel is far less susceptible to wildfire damage and damage from animals, enabling faster and lower cost repairs following future fire events. Installing more reliable steel poles during the deployment of covered conductor requires upfront capital investment, but these measures can substantially reduce long term costs, emergency response expenses, and service disruptions. As steel poles are not as susceptible to damage from animals such as birds and insects that may leave large quantities of holes, the pole lifespan can be extended beyond that of a wood structure reducing long-term costs. The total cost addition for utilization of steel poles over wood structures along the entire alignment is relatively small at 4.5%, given the long term benefits and efficiencies of replacement during construction. Hardening efforts in the HFTD also include replacing aging wood poles and conductors with high strength conductors, increasing conductor spacing, and upgrading overhead distribution equipment attached to the same poles and along the same routes. These enhancements reduce the likelihood of ignition caused by vegetation or foreign object contacts, wire slaps, and equipment failures during adverse weather or high wind conditions by improving structural resilience and designing to local wind conditions. While these measures reduce the likelihood of ignition, they do not reduce the consequence of an ignition should one occur.

• Enhanced Equipment Protection: The use of CalFire-rated lightning arrestors and current-limiting fuses further reduce ignition risk, providing critical protection to electrical equipment and infrastructure.

Overall, SDG&E's CC Hardening Program in 2023 not only fulfilled its wildfire mitigation objectives but also set a benchmark for risk-based planning, operational excellence, and regulatory compliance. The program's combination of advanced engineering, targeted risk reduction, and improved system resilience underscores its justification as an essential investment in public safety and reliable service.

Project Scope:

The CC program involved the systematic replacement of existing bare 12kV primary overhead conductor with a multi layer insulated conductor system designed to materially reduce ignition risk from contact, wire slap, and environmental exposure. The scope includes:

- Installation of standard CC hardware that covers any exposed conductor and other material such as, conductor end caps, dead-end clamps, fusion tape, post insulators and tie wire, piercing, connectors, vibration control dampers
- CalFire rated equipment that reduce arcs/sparks when they operate including lightning arrestors and current-limiting fuses
- Avian protection standards that includes wildlife covers for transformers, switches, regulators, and capacitor bushings; covered conductor jumpers for equipment and line taps; wire spacing of 60 inches or more between 12kV-to-12kV conductors or 12kV to grounded conductor or pole
- Replacement of wood poles and crossarms with steel poles and fiberglass crossarms
- Reuse of existing steel poles where adequate structural loading and clearances can be maintained per General Order 95
- Secondary conductors (<600V) are replaced as necessary, including instances involving bare conductors or grey covered conductors
- Permanent removal of bare conductor and equipment where no current or future use is expected by the customer, per General Order 95, Rule 31.6

SDG&E's CC program employs advanced engineering practices, integrating PLS CADD with LiDAR-informed designs, wood to steel pole transitions, adherence to General Order 95 clearance standards, and rigorous stage-gate QA/QC processes before and after construction. This systematic lifecycle approach is intended to mitigate failure modes identified by Joint Investor Owned Utility testing—including Ultraviolet exposure, aging, corrosion, and ingress—through targeted installation methods (e.g., gel wraps/fusion tape, Insulation Piercing Connectors) and structured inspections, resulting in improved risk mitigation and asset durability. LiDAR data was also, used to support other work including vegetation risk analysis where horizontal, vertical, and radial clearance checks can be performed to reduce the risk for tree strikes, tree fall-in, or vegetation contact as well as correcting missing or incorrect asset data in the asset inventory system of record. By using LiDAR with PLS-CADD, the structural design could be validated and sag and clearance checks were performed for the proposed final design under all applicable load and weather conditions. PLS-CADD provided detailed design and structural information assisting with determining what additional equipment needed to be replaced to adhere to loading requirements and remain in compliance with GO95 requirements. Within the final designs, SDG&E utilized steel structures for all structures within the design to increase the resiliency of the newly harden segments. Compared to other IOU's, SDG&E costs are higher per mile due to the replacement of all wood poles with fire resistant steel poles, the additional measures taken to ensure a quality product including rigorous design and engineering practices using LiDAR and PLS-CADD structural analysis and design software before and after construction, and the robust quality control measures applied during design and after construction.

For 2023 the scope of work included projects that were initiated under the Distribution Overhead System Hardening (WMP.475) program in 2018 and 2019 (i.e., formally Fire Risk Mitigation (FiRM) and Pole Risk Mitigation Engineering (PRiME) programs) As a result, the prioritization and selection of these CC segments occurred prior to the RSE methodology outlined in SDG&E's 2021 RAMP filing and before the more advanced WiNGS modeling and risk assessment processes available in 2023. The selection of feeder segments for the 2023 CC mileage was guided by SDG&E's targeted efforts to reduce wildfire risk. The program is intentionally structured to focus on HFTD Tier 2 and Tier 3 areas, where CC delivers the highest wildfire risk reduction per dollar and where overhead contact related ignition drivers are most prevalent.

In 2023 the areas of the services territory hardened by CC included:

- Barrett Lake (Tier 3, ~3mi),
- Boulevard (Tier 2, ~8mi)
- Campo (Tier 3, ~28mi),
- Japatul (Tier 3, ~1mi),
- Poway (Tier 2, ~3mi),
- Ramona Grasslands (Tier 3, ~2mi)
- Warner Springs (Tier 3, <1mi; Tier 2, ~5mi)

As further discussed below, SDG&E aligns CC deployment with other long-term system hardening programs to avoid redundancy.

The overall scope aims to achieve targeted wildfire-risk reduction while upholding engineering and safety standards, minimizing redundant construction, and supporting the grid-hardening objectives required under the WMP and AB 1054.

Cost Drivers:

The primary factors contributing to CC costs are listed below:

1. Program and project management oversight, document control, scheduling, financial management,
2. Engineering and design services, such as Power Line Systems - Computer Aided Design and Drafting (PLS-CADD) software-based structural analysis, drafting, and job package preparation.
3. Surveying activities that includes base-mapping, LiDAR data acquisition and processing before and after construction, as well as job walk site assessments during design and construction staking.
4. Geographic Information System (GIS) services to produce mapping products for scoping, project management, reporting, and quarterly data reporting to the Office of Energy Infrastructure Safety (OEIS).
5. Public relations to support daily fielding activities, including drone Light Detection and Ranging (LiDAR) flight notifications, coordination with sensitive landowners for design job walks and construction support, and ad hoc public/agency inquiries.
6. Land management involving research, interpretation, and acquisition of land rights.
7. Environmental consulting services were consulted to understand potential environmental challenges and to help inform schedule and budget constraints.
8. Permitting support including city, county, state, and federal agencies.
9. Legal services for resolving land rights disputes, including actions such as injunctions.
10. Staging yard setup, maintenance, and demobilization.
11. Materials, including conductors, cables, connectors, polymer insulators, fiberglass crossarms, steel poles, transformers, switches (manual and automated), capacitors, regulators, as well as underground materials for riser poles facilitating transitions from 12kV and secondary overhead to underground systems.
12. Construction labor, encompassing both internal crews and contractors for electric work, and contractors for civil work (pole hole and anchor digging, trench and conduits for riser poles). Hard digging and access limitations are often the largest cost drivers for projects, where in some cases a single pole and anchor hole can take several days to weeks to dig and may require helicopters to fly personnel and equipment to and from the site.
13. Program initiation, scheduling, and coordination with other hardening initiatives to prevent overlaps with Strategic Undergrounding, Corrective Maintenance, or other planned infrastructure upgrades along identical circuit segments.
14. Additional field during design, due to environmental restrictions, land rights acquisitions/disputes, and/or permitting request. In some cases, we had to work with the landowners to finalize design changes to re-route a section of a circuit to improve access to our facilities for construction and maintenance.
15. Detailed engineering and circuit design development, covering conductor sizing, hardware selection, updates to crossarm and attachment configurations, clearance verification, and structural loading analysis correlated to CC mechanical specifications. In locations with steep terrain, such as hillside, additional pole setting depths are required and may require concrete backfill to improve soil stability.
16. Environmental review, permitting processes, and right-of-way coordination necessary for pole replacements, developing access routes, instituting traffic control measures, and scheduling work within environmentally sensitive or HFTD areas. In many cases, truck access is not possible due to environmental restrictions and may require specialized equipment such as cranes or helicopters.

To achieve unit cost efficiencies, SDG&E implemented strategies such as awarding projects in bundles for engineering, survey, and construction, by utilizing a standardized pricing workbook for comparative bid evaluations, increasing supplier diversity. In 2023, over 70% of the miles constructed leveraged internal electric construction crews, which are typically less expensive than contract crews depending on site conditions and access challenges. Quality assurance and quality control (QA/QC) closeouts typically occur in the subsequent year and represent a minor proportion of the total capital expenditure. These measures directly address the Commission's expectations regarding cost discipline without compromising lifecycle quality.

In 2023 the CC program incurred both O&M and Capital costs, depending on the scope of each project. The vast majority of costs on the CC program were Capital in nature; however, there were projects that did incur O&M. For reconductor projects, most expenses were Capital since conductor and poles—major properties—were installed, removed, or replaced. However, certain tasks, such as minor installations or replacements not part of a major unit, were classified as O&M. For example, items like installation of pole caps and plugs on existing steel poles, or avian protection that failed, or guy guard replacements that were discovered during job walks were included in the reconductor project and noted as O&M in its accounting treatment. Other CC project types, such as Fast Track (FT), were mainly O&M since they involved minor work instead of major property installs, removals, or replacements.

Project Timing and Phases:

The Covered Conductor (CC) program in 2023 advanced through a series of structured activities and stages, consistent with regulatory requirements and industry best practices. Individual CC projects typically proceeded along a 12–18-month timeline for design, followed by approximately 3 months for construction and 4 months for close-out. Projects were issued and executed independently, based on constructible scope and available funding, guiding compliance and cost discipline throughout each stage.

CC projects consistently followed a repeatable, stage-gated process. This began with risk-based portfolio selection utilizing a qualitative analysis of meteorogical input, fuel conditions, fire history, asset information, tree data, and PSPS impacts, then progressed through engineering and permitting, competitive procurement and integration of internal crews, field construction, and ultimately commissioning and QA/QC closeout. A minor portion of capital—such as QA/QC punch list corrections, asset record finalization, and capitalization memos—was posted in the subsequent fiscal year as trailing close-out for assets placed into service in the prior year.

Stage 1 — Project Scoping/Initiation
• WiNGS portfolios were selected based on risk and RSE criteria in 2021 and 2022.
• RSE scores were reviewed to confirm they exceeded minimum thresholds; HFTD tiering (Tier 2 and Tier 3), ignition history, PSPS history, cost, and constructability factors were considered.
• LiDAR surveys and base-mapping were conducted to support accurate engineering and design.
• Land and environmental reviews informed the Engineering and Design process.
• Projects were established in core systems, including financial, project management, and mapping platforms.

Phase 2 — Preliminary Engineering & Design (E&D)
• 30% and 60% engineering analyses were performed in PLS-CADD, leveraging LiDAR survey data to accurately assess pole, crossarm, and anchor loading, as well as wire clearances, adhering to compliance with General Order 95.
• Job-walks were conducted with all relevant disciplines, including Qualified Electrical Workers (QEW), land management, environmental specialists, surveyors, engineers of record, and project managers.

Stage 3 — Final Design, Permitting, Land Rights, Environmental
• 90% and 100% engineering and design phases were completed.
• All required permits, land rights, and environmental releases were secured.
• Construction packages were issued to the construction teams.

Stage 4 — Pre-Construction
• Staging yards were established.
• Materials with short lead times were procured.
• Communications with customers and property owners were initiated, including outage coordination and access protocols to provide safety communication to crews and community.
• Survey construction staking was completed.
• Civil and electrical crews were mobilized.

Stage 5 — Construction
• Civil crews excavated pole and anchor holes and performed trenching and conduit work for riser pole locations.
• Electrical crews set poles, installed equipment and hardware, strung new conductors, and removed old poles and equipment.
• Road and site restoration was completed as required.
• Civil and electrical crews provided preliminary As-Built documentation.

Stage 6 — Close-out
• Post-construction QA/QC inspections were conducted by QEW.
• Post-construction LiDAR surveys and imagery were collected and provided to Engineer of Record to perform PLS-CADD analyses (True-Up Analysis) to confirm compliance with General Order 95 and SDG&E standards, such as conductor tension, clearances, and structural loading.
• Remediation work, also known as punch list items, was completed as necessary.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Procurement used competitive solicitations for Survey/E&D/Construction by pre-approved suppliers, bundled circuit bid packages, utilized a standardized pricing workbook, and documented bid tabs/award justifications to safeguard cost, schedule, and quality. Vendor selection weighed safety, cost, capacity, quality, performance; internal crews were deployed for electrical construction where they could meet schedule and cost without sacrificing quality. The payment structure was tailored to the type and scope of work, including time and expense (T&E) rates, fixed costs with milestone payments, unit rates, and combinations of all three based on scope of work.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

SDG&E's approved WMP target for this program was 60 miles in 2023. The program achieved its approved annual targets and completed approximately ~~50~~ 47 miles of overhead grid hardening work during the reporting year. Unit actuals provided reflect completed projects placed in service and recorded to SDG&E's WMPMA in 2023 and may be different than completed projects reflected in SDG&E's WMP reporting, which are tied to project energization. WMP planned capital spend was $76,806,000, planned O&M spend was $2,220,000.

The costs reflected in the tables above represent the full scope of activities required to deliver this work, including engineering, materials, construction, permitting, project management, and any related support functions. Expenditures also include the necessary field mobilization, quality assurance, and coordination efforts associated with completing overhead system upgrades in high priority areas. These costs align with the program's authorized work plan and reflect the resources needed to meet the approved units of work while being in compliance with applicable regulatory and safety requirements.

Risk Identification and Mitigation:

Covered Conductor addresses several risks such as ignitions by preventing arcing and ignition during phase-to-phase contacts at rated voltage or vegetation and object contact, PSPS reduction for customers and communities by allowing for higher wind speed thresholds (50 mph versus 45 mph for bare conductors), impacts on customers and communities, and fire resistance equipment going from wood to steel poles improves system durability.

Lifecycle issues such as UV exposure, ingress, and corrosion were managed by integrating IOU test results into both construction and maintenance, along with measures including gel wraps, fusion tape, insulation piercing connectors, and inspections. To avoid SUG/CMP overlap, non-overlap governance was enforced, and CC was excluded where SUG/CMP applied. As a contingency in case targeted projects were delayed for various reasons such as land rights, permitting, and/or environmental challenges, the workplan for 2023 also included approximately 30% more miles of projects (i.e., 78 miles planned for construction out of the 60 mile WMP target).

SDG&E's Covered Conductor program utilized the Risk Spend Efficiency (RSE) framework, which was grounded in the Multi Attribute Value Function (MAVF) methodology, to quantify how covered conductor installations reduce wildfire, PSPS, and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition risk reduction to develop a normalized risk reduction score for the program. This risk reduction value was then compared to program costs to produce a unitless RSE metric that reflects the relative efficiency of risk mitigation per dollar invested.

Risk identification within SDG&E's Covered Conductor program began by assessing circuit-level conditions and operational factors that influence ignition risk, including historical ignition drivers, terrain complexity, vegetation density, asset condition, and system criticality. This analysis contributed to covered conductor installations were prioritized in areas where environmental hazards, system needs, and operational risk profiles justified targeted mitigation. The program's mitigation strategy incorporated detailed engineering assessments, field validation, workforce training, and standardized construction practices, along with quality-assurance reviews to ensure that installations met design and safety requirements. SDG&E also integrated inspection and operational data into advanced analytics tools that supported the identification of circuits and assets most likely to benefit from hardening. These capabilities enabled earlier detection of asset degradation, more accurate assessment of ignition potential, and informed decisions regarding where covered conductor installation would yield the greatest safety and reliability benefits.

The following table summarizes key program metrics to demonstrate how this program contribute to measurable wildfire risk reduction:

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	~~39.2~~ 37.1	~~0.065~~ 0.061	~~101.23~~ 95.83	~~1.04%~~ 0.99%	~~102.13~~ 47.35
Tier 2	~~10.4~~ 9.7	~~0.014~~ 0.013	~~13.24~~ 12.32	~~0.24%~~ 0.22%	~~50.33~~ 23.34
Non - HFTD / WUI	0	---	---	---	---

Consideration of Alternative Solutions:

SDG&E evaluated alternative approaches prior to developing and implementing the Covered Conductor program.

1. Strategic Undergrounding (SUG): SUG consistently offered the highest long-term risk reduction and PSPS mitigation benefits. However, SUG was not always immediately constructible due to permitting, outage constraints, and challenging terrain. SDG&E's grid hardening decisions are informed by internal risk models to appropriately target mitigation strategies to risk.

2. Traditional Hardening: Traditional overhead system hardening provided a lower RSE compared to CC and SUG, as documented in the joint Investor-Owned Utility (IOU) effectiveness study. Based on the higher RSE of Covered Conductor versus traditional hardening, SDG&E over time elected to prioritize covered conductor installation over this alternative.

3. Do Nothing: A do nothing option did not provide any enhancements to mitigating ignitions and could result in increased reliance on PSPS. CC also improved the resilience of the facilities during any weather event, not just Santa Ana wind events..

4. Joint IOU Effectiveness Framework: The joint IOU framework, as referenced in the effectiveness study, demonstrated how combined mitigations—including CC, targeted inspections, and vegetation management—were evaluated in an integrated manner.

Coordination with Similar Programs

The Covered Conductor Hardening (CC) program was strategically coordinated with other wildfire mitigation initiatives, including Strategic Undergrounding (SUG), Corrective Maintenance Program (CMP), and the Overhead System Hardening program (Traditional Hardening, TH) to assist with efforts being complementary rather than duplicative. Through careful screening, the CC scope was evaluated against these programs to maximize risk reduction and portfolio-level RSE. In 2023, this disciplined approach was a guiding principle for execution. Coordination was achieved through the following methods:

- Prescreening against Strategic Undergrounding (SUG): Each candidate CC segment was cross-checked with current SUG program lists and long-range construction plans. If underground was authorized, planned, or in late-stage development, CC installations were de-scoped to prevent redundant construction or stranded costs.
- Cross-checking with Corrective Maintenance (CMP) & Traditional Hardening: Candidate CC spans were reviewed alongside CMP remediation packages, inspection-driven replacements, and TH scopes. If corrective or like-for-like rebuilds were scheduled that addressed the same risk, CC was either excluded or re-sequenced to improve efficiency and avoid overlap.
- Urgent CMP Remediation: In cases where there was overlap between CMP and CC and the CMP issue required urgent remediation that could not wait for the CC work, the CMP continued as planned. In such situations, CC engineers coordinated closely with the CMP engineer to assist with the CMP work to support its compatibility with future CC installations, minimizing the risk of rework and supporting long-term system integrity.
- Shared Governance & Change Control: Coordination was formalized through portfolio meetings and documented in change logs. These logs captured the rationale for any movement of segments between programs, such as constructability, outage constraints, or environmental windows, providing transparency and accountability.
- Design Integration: When small, localized asset upgrades (e.g., crossarm or insulator standards) were required, they were incorporated into the CC build, rather than managed as separate projects. This reduced mobilizations, minimized traffic control events, and streamlined restoration windows.
- Sequencing with PSPS Mitigation Work: If sectionalizing, protection upgrades, or communications enabling projects were scheduled on the same feeder, CC installations were sequenced to minimize customer impacts and avoid duplicative outages.
- Execution Discipline in 2023: CC was rigorously screened against SUG and inspection-driven work prior to releasing design and construction. This provided guidance around no circuit segment being CC hardened if it was already committed to SUG or an equivalent CMP scope.
- No Overlap check: Applied during planning and maintained at construction release, validating that CC hardening did not proceed where SUG or CMP work was already scheduled.
- Conflict Resolution: When conflicts emerged—such as accelerated SUG approval—CC scope was de-scoped or deferred, and budgets were reallocated to higher RSE CC candidates, thereby preserving overall portfolio value.

Stakeholder Impact and Engagement:

Communities in the HFTD/WUI benefit from reduced ignition risk and potential PSPS windspeed threshold increases where CC was installed. SDG&E's WMP filings detail engagement with Energy Safety, the Commission, public safety partners, and community stakeholders to align mitigation with community needs and regulatory expectations. Implementation of CC required coordination with regulatory agencies, landowners, and other stakeholders as part of environmental review and permitting activities. Stakeholder engagement is sequenced consistently with the program's phased timing and is conducted in advance of construction to support safe access, compliance with environmental requirements, and efficient construction execution

Communities & customers.
• Construction transparency: Prior to construction, SDG&E coordinates with local jurisdictions on excavation, encroachment, and traffic control permits that may include specific work windows, and communicate with impacted customers on timing, potential outages, and restoration plans.
• Access and functional needs: Outreach includes targeted communications to medically vulnerable customers and critical facilities in affected areas, coupled with scheduling practices that minimize disruption.
• Public safety partners & agencies.
• Jurisdictional coordination: Work windows and patrol plans are aligned with fire agencies and local public works to maintain access for emergency response and to mitigate construction related hazards.
• Operational alignment: CC deployments were prioritized on feeders with recurring fire weather exposure, coordinating with operational protocols (e.g., protection settings, patrols) to reduce field risk during peak seasons. Dedicated fire watch crews were onsite during construction activities that could cause sparks during elevated fire conditions to mitigate potential fires. Where helicopters were used for construction, FAA protocols were followed and evacuation plans for residences when required for safety reasons.
• Program updates are shared through WMP compliance reporting and proceeding interactions, providing transparency on targets, delivery, and risk outcomes.
• Community feedback loop: Lessons from community meetings (e.g., access constraints, noise, school or hospital proximity) were incorporated into design and construction staging.

Metrics:

In 2023 a total of approximately ~~50~~ 47 miles of Covered Conductor was installed.

To demonstrate prudency, effectiveness, and alignment with approved wildfire-mitigation objectives, the Covered Conductor (CC) program uses a set of clear, outcome-based metrics. These metrics measure both what was delivered and what value was achieved—including risk reduction, lifecycle performance, and cost discipline. Together, these indicators show whether SDG&E's CC investment met its intended wildfire-mitigation goals.

Post-construction inspections, LiDAR survey and engineering True Up Analysis showed adherence to key lifecycle-quality practices, including the use of protective wraps/gel systems, proper avian protective covers and wraps, correct installation of connectors, and confirmation that hardware and clearances matched design requirements. Field observations confirmed that construction standards derived from industry testing were properly implemented, supporting long-term CC performance and durability.

Utility Benchmarking:

SDG&E's 2023 Covered Conductor expenditures were supported by a Joint Investor-Owned Utility benchmarking study in the 2022 WMP update that evaluated the effectiveness of covered conductor using independent testing, multi-utility field experience, and ignition-mechanism-specific analysis. The study demonstrated that covered conductor construction materially reduces ignition risk by preventing arcing during contact events that dominate overhead distribution ignitions in High Fire Threat Districts. SDG&E operationalized these benchmark findings within its Probability of Ignition and Risk Spend Efficiency models, enabling direct comparison of covered conductor against alternative mitigations and the capital was directed to the highest circuit segments. Consistent with benchmarking insights, approximately two-thirds of 2023 covered conductor mileage was installed on the top risk-ranked segments, and deployment was screened to avoid overlap with Strategic Undergrounding or corrective maintenance programs. The benchmarking study also informed SDG&E's construction and QA/QC standards, guided lifecycle performance consistent with observed failure modes.

Compared to other IOU's SDG&E costs are higher per mile due to the replacement of all wood poles with fire resistant steel poles, the additional measures taken to provide a quality product including rigorous design and engineering practices using LiDAR and PLS-CADD structural analysis and design software before and after construction, and the robust quality control measures applied during design and after construction.

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Strategic Undergrounding ("SUG")
WMP Tracking ID	WMP.473

Description	**Strategic Undergrounding**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	8	841	934	4,826	1,290
Capital Expenditures Non-Labor	189	38,452	69,572	126,034	~~64,584~~ 105,979
Capital Expenditures Direct Costs Subtotal	**198**	**39,293**	**70,506**	**130,859**	~~**65,873**~~ **107,268**
Capital Expenditures Indirect Costs	110	11,905	6,476	29,895	10,998
Capital Total	**308**	**51,199**	**76,982**	**160,755**	~~**76,872**~~ **118,267**
O&M Labor	-	-	0	29	3
O&M Non-Labor	-	-	0	146	426
O&M Direct Costs Subtotal	**-**	**-**	**0**	**176**	**429**
O&M Indirect Costs	-	-	-	5	10
O&M Total	**-**	**-**	**0**	**180**	**439**
Units					
Miles*		16	26	65	**46**
FTE**	0.1	6.7	7.2	36.0	**9.0**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
HFTD Undergrounding					
Capital	**198**	**39,293**	**70,506**	**130,859**	~~**65,873**~~ **107,268**
Labor	8	841	934	4,826	1,290
Non-Labor	189	38,452	69,572	126,034	~~64,584~~ 105,979
O&M	**-**	**-**	**0**	**176**	**429**
Labor	-	-	0	29	3
Non-Labor	-	-	0	146	426
HFTD Undergrounding Total	**198**	**39,293**	**70,506**	**131,035**	~~**66,303**~~ **107,697**

Business Purpose:

The Strategic Undergrounding (SUG) Program was designed to address an identified and growing risk to public safety by permanently reducing wildfire ignition potential associated with overhead electric distribution facilities located in High Fire Threat District (HFTD) Tier 3 and Tier 2 areas.

The program replaced overhead distribution facilities with underground infrastructure in locations where wildfire consequences were severe and where other mitigation measures would not eliminate ignition exposure. By removing overhead conductors and equipment from high risk environments, the SUG Program materially reduced the likelihood of utility-caused wildfire ignitions and mitigated the need for potential Public Safety Power Shutoff (PSPS) events in those areas. When all overhead distribution facilities were replaced with underground infrastructure, the potential ignition sources during a Santa Ana wind event were eliminated, which also removes the need to de-energize the distribution system along these segment based on weather conditions immediately within their area. Although such customers may still be impacted by PSPS events if weather impacts upstream overhead devices of the substation serving these circuit segments, the duration may be reduced.

The program directly supports SDG&E's approved Wildfire Mitigation Plan (WMP) and is consistent with the Commission's direction to utilities to prioritize risk-based, preventative investments that reduce catastrophic wildfire risk and enhance public safety.

Project Justification:

SDG&E's service territory includes areas that have experienced increasingly severe wildfire conditions due to climate change, prolonged drought, and more frequent extreme wind events. These conditions materially increase the likelihood that overhead electric facilities may act as ignition sources during Red Flag Warning conditions.

Undergrounding is the only mitigation measure that eliminates exposure to the most common overhead ignition mechanisms that can result in catastrophic wildfire events, including:

- Wind driven vegetation and debris contact
- Conductor slap and equipment failure
- Vehicle and pole impacts
- Weather driven mechanical stress

While overhead hardening measures can reduce ignition probability, they do not eliminate ignition exposure. Underground systems are not subject to these failure modes and can continue operating safely during extreme weather conditions.

SDG&E strategically targets undergrounding to circuits that pose significant wildfire and/or PSPS risk. The requested funding reflects a reasonable and necessary investment to address an identified safety risk consistent with California Public Utilities Code Section 8386(d)(8).

Project Scope:

The SUG Program was a multi year, risk prioritized program. Candidate circuit segments were identified through SDG&E's wildfire risk modeling and PSPS exposure analysis. Each segment was evaluated to determine the most effective mitigation solution, considering wildfire risk reduction, constructability, cost, environmental constraints, and community impacts.

Projects were grouped into construction bundles based on permitting jurisdiction, geographic proximity, customer impacts, and delivery efficiency. These bundled projects collectively contributed to SDG&E's annual undergrounding mileage targets under the WMP.

A typical SUG project included:

- Engineering and detailed design
- Environmental review, permitting, and land rights analysis & acquisition
- Civil trenching and conduit installation
- Installation of underground cable and associated equipment
- Load transfer and commissioning
- Removal from Service (RFS) of overhead facilities

The selection of the feeder segments undergrounded in 2023 were selected or scoped in 2020 and 2021. This is due to the time it takes to engineer, permit, acquire easements, and construct these mitigation projects. Feeder segment selection for the 2023 Undergrounding miles was driven by SDG&E's targeted efforts to reduce both wildfire risk and PSPS impacts. The 2023 prioritization focused on segments with aging overhead infrastructure that is more susceptible to failure during the extreme wind events typical of peak fire weather conditions. In these locations, a single conductor or pole failure has the potential to ignite fastmoving wildfires with catastrophic consequences for public safety, community resilience, and local economic activity. The prioritization criteria was more qualitative and based on meteorological, past ignitions or wildfires, historical wind speeds, and known areas of fuels.

Feeder Segment	Notes	UG miles	Average Conductor Age	Vegetation Risk Index	Max Wind Speed	Customers Downstream
1030-18R	Circuit 1030 (HFTD T3) is an area of extreme wind and PSPS potential (Hellhole Canyon Preserve). With a 99th % wind of 70 mph and a peak gust of 91 mph, any ignition poses an almost immediate life and property threat to Valley Center.	1.73	51.1	Medium	91	510
221-1230F	Circuit 221 (HFTD T3) is prone to very strong wind and is in the area (within 5 miles) where two of the largest and most destructive fires in CA history ignited (Witch Fire and Cedar Fire). An ignition could cause an almost immediate life and property threat to Julian and Ramona.	2.91	7.3	Low	60	3
221-37AE		1.19	27.4	Medium	44	1339
221-43		0.30	24.6	Medium	54	102
221-824		0.94	57.6	Medium	44	617
CB 222	Circuit 222 (HFTD T3) is prone to very strong winds and is in the immediate area (within 2 miles) where two of the largest and most destructive fires in CA history ignited (Witch Fire and Cedar Fire). An ignition could cause an almost immediate life and property threat to Julian and Ramona.	0.14	25.9	Medium	52	1502
222-1364R		3.13	45.9	Medium	61	1048
222-1370R		0.75	31.4	Low	74	412
222-1401R		2.87	35.7	Medium	63	258
222-2013R		5.36	60.7	Medium	63	483
222-1503		1.59	72.7	Medium	61	288
445-17R	Circuit 445 (HFTD T2) is prone to very strong winds and is in the area (within 10 miles) of the ignition point of one of the largest fires in CA history (Laguna Fire).	4.70	77.0	Low	57	163
972-26R	Circuit 972 (HFTD T2 & T3) is prone to strong winds and is in an area of high threat from vegetation contacts.	2.95	92.1	Medium/High	50	3145
CB 441	Circuit 441 (HFTD T3) is prone to extreme winds (Buckman Springs) and in the vicinity (within 5 miles) of the ignition point of one of the largest fires in CA history (Laguna Fire)	0.20	16.0	Low	69	15
CB 73	Circuit 73 (HFTD T3) is in an area of strong winds and also in the footprint of one of the largest fires in CA History (Laguna Fire). Any ignition on this circuit would quickly threaten life and property on the Viejas Reservation.	2.66	50.2	Medium	62	771
CB OK1	4kV stepdown of circuit 221 (HFTD T3). An ignition could pose immediate life and property threat to Julian.	14.57	95.0	High	61	257
CB SL1	4kV stepdown of circuit 221 (HFTD T3). An ignition could pose immediate life and property threat to Alpine.	0.39	110.4	High	44	229

This table provides a high level summary. Certain data sources were consolidated, and reasonable assumptions were made where gaps existed to ensure completeness.

Cost Drivers:

Program costs were driven by the following primary factors:
• Engineering and design complexity
• Material procurement (cable, conduit, vaults, switching equipment)
• Civil construction and surface restoration
• Electrical construction and commissioning
• Program support costs, including permitting, environmental compliance, land services, and project controls

Additional costs reflected the prudent ramp up required to meet increasing WMP undergrounding mileage targets while reducing cost per mile of undergrounding. In 2023 SDG&E developed a contracting initiative to implement a program management office (PMO) to optimize pre-construction activities, including; survey & design, land rights & acquisition services, permitting, material procurement, environmental services and customer & stakeholder outreach. Construction contracts were competitively bid to allow for cost-effectiveness, workforce scaling, contractor mobilization, and supply chain coordination. The associated costs are reasonable and directly attributable to the Commission approved expansion of wildfire mitigation activities.

Project Timing and Phases:

SUG projects progress through defined phases:
1.Risk identification and prioritization
2.Preliminary engineering and feasibility assessment
3.Environmental review and permitting
4.Final design and material procurement
5.Construction and commissioning
6.Removal of overhead infrastructure
Project schedules varied depending on permitting complexity, jurisdictional requirements, weather conditions, and customer density. SDG&E managed these risks through early agency engagement, bundled project delivery, and adaptive scheduling.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

SDG&E's Supply Management organization supported the program using the utility's standard contracting and procurement framework, including competitive solicitations when appropriate, qualification of vendors, and adherence to enterprise procurement policies enabling transparency, fairness, and value.

To reduce the risk of material shortages and procurement delays, SDG&E employed advanced supply chain management strategies such as early material forecasting, advance purchasing, supplier diversification, and coordination with broader enterprise procurement initiatives. These practices helped secure long lead components, mitigated cost volatility, and reduced schedule risk, supporting timely execution of SUG projects across the service territory.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

SDG&E completed 45.5 miles. Unit actuals provided reflect completed projects placed in service and recorded to SDG&E's WMPMA in 2023 and may be different than completed projects reflected in SDG&E's WMP reporting. Planned Capital spend was $196,200,000, planned O&M spend was $436,000.
Program execution and expenditures were tracked for transparency, accountability, and compliance with Commission directives.

Risk Identification and Mitigation:

Key risks included permitting delays, land rights/easement acquisition delays, supply chain constraints, weather impacts, and community/stakeholder questions. SDG&E mitigated these risks through:

- Early stakeholder and agency engagement
- Advance material ordering
- Flexible construction sequencing
- Proactive customer communications

SDG&E's Strategic Undergrounding (SUG) program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi Attribute Value Function (MAVF) methodology, to quantify how converting overhead distribution lines to underground reduced wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition risk reduction to generate a normalized risk reduction score for each segment considered for undergrounding. This risk reduction value was then compared against program costs to produce a unitless RSE metric that reflected the relative efficiency of risk mitigation per dollar invested.

Risk identification within SDG&E's SUG program began with an assessment of circuit level conditions and operational factors that influenced ignition likelihood and consequence, including historical ignition drivers, terrain and soil conditions, vegetation density, asset condition, circuit criticality, and exposure to environmental hazards. This analysis helped undergrounding segments be prioritized in locations where long term risk reduction, operational needs, and system resiliency objectives justified the investment. The program's mitigation strategy incorporated detailed engineering and constructability assessments, field validations, workforce training, and standardized construction and trenching practices, complemented by quality assurance reviews to confirm installations met design, safety, and operational requirements.

SDG&E also integrated inspection, operational, and system planning data into advanced analytics tools to identify circuits and assets that would benefit safety, reliability, and wildfire mitigation from undergrounding. These analytics capabilities supported early identification of high risk segments, more accurate assessment of ignition potential, and informed decision making on where undergrounding provides the most effective long term mitigation.

The following table summarizes key program metrics to demonstrate how the SUG program contributes to measurable wildfire risk reduction:

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	41	0.103	527.76	4.3%	~~206.43~~ 127.09
Tier 2	5	0.01	43.51	0.7%	~~139.56~~ 85.92
Non - HFTD / WUI	0	---	---	---	---

Consideration of Alternative Solutions:

Alternative mitigation measures—including covered conductor, targeted pole replacements, and enhanced vegetation management—were systematically evaluated during SDG&E's project screening process. These alternatives can meaningfully reduce ignition likelihood by strengthening overhead infrastructure or modifying vegetation conditions around the line. However, each of these approaches retains some degree of overhead exposure to weather, third-party interference, vegetation growth, and long-term asset degradation. As a result, even with enhancements, these measures cannot fully eliminate ignition potential under severe environmental or operational conditions.

Undergrounding removes the conductor and associated distribution equipment from exposure to wind, vegetation, and airborne debris, thereby eliminating key ignition drivers inherent to overhead systems. During prioritization, SDG&E considered these whether alternative mitigations could reasonably achieve the same level of long-term risk reduction within the same geographic and environmental context. In the locations chosen for undergrounding, alternatives either provided only partial mitigation or required repeated maintenance cycles, resulting in higher long-term costs and lower overall risk-reduction effectiveness when compared to undergrounding.

Undergrounding was therefore selected in circumstances where it demonstrated a superior, permanent, and lifecycle-cost-effective risk-reduction benefit relative to available alternatives. This decision framework aligns with SDG&E's risk-based planning practices, supports long-term wildfire-mitigation objectives, and guide capital investments targeted toward the strategies that reduce ignition potential most effectively and sustainably.

Coordination with Similar Programs

The SUG Program was coordinated with SDG&E's broader wildfire mitigation portfolio, including overhead hardening, vegetation management, and system resiliency programs. Coordination supported efficient capital deployment and avoided redundant construction activities.

Stakeholder Impact and Engagement:

SDG&E's Strategic Undergrounding (SUG) Program was supported by a comprehensive communications and stakeholder engagement framework designed to promote safe, coordinated, and transparent program execution throughout the project lifecycle. The Communications and Stakeholder Engagement Plan, as documented in the Strategic Undergrounding Program Execution Plan (PEP), established structured internal and external communication processes aligned with SDG&E standards and regulatory expectations.

The communications framework was organized around two integrated components: internal communications and external communications. Internal communications focused on coordination among SDG&E and its contractor and subcontractor teams responsible for planning and executing SUG work. These activities were governed by the Strategic Undergrounding Internal Communications Plan (ICP), which provided a standardized approach for information sharing, escalation, crisis communications, and organizational change management. The ICP defined roles and responsibilities, established feedback mechanisms, and incorporated SDG&E's Electric Engineering & Construction Department Project Management Manual, Crisis Communications Plan, and Brand Guidelines providing consistency and accountability across the program.
The contractor was responsible for maintaining and executing the ICP, coordinating with SDG&E communications leadership, and tracking internal communications performance. Subcontractors participated in these processes providing alignment between field execution and program level objectives. The plan included defined governance structures, RACI matrices, and data tracking processes to support effective decision making and timely issue resolution throughout program delivery.

External communications addressed engagement with customers, property owners, communities, public agencies, and other external stakeholders impacted by undergrounding activities. These efforts were guided by the Strategic Undergrounding External Communications Plan (ECP), which established a consistent, multiprong outreach strategy spanning early project notification through construction and restoration. The external communications framework emphasized proactive engagement, transparency, and responsiveness to stakeholder concerns.

The external communications team coordinated broad public communications, targeted stakeholder outreach, and property owner engagement. Dedicated Property Owner Liaison subcontractors served as single points of contact for impacted property owners, managed Permission to Enter (PTE) acquisition, and tracked stakeholder interactions to streamline access and reduce construction delays. This structure was intended to minimize customer disruption and improve the overall stakeholder experience.

External outreach tools included public notifications, virtual webinars, in person open houses, website updates, community platforms, and directed property owner communications. Communications activities were tracked and periodically reviewed, with lessons learned incorporated into updates of the ECP to support continuous improvement. The plan also included coordination with SDG&E's Tribal Affairs organization and referenced separate processes within the PEP guiding appropriate engagement with Tribal communities.

Collectively, SDG&E's communications and stakeholder engagement approach supported the timely and effective execution of the Strategic Undergrounding Program. By establishing clear governance, defined roles, and structured engagement processes, the program reasonably managed stakeholder impacts, reduced execution risk, and supported the prudence of Strategic Undergrounding costs incurred during 2023.

Metrics:

Program performance was tracked using metrics including:
- Miles of undergrounding completed
- Wildfire risk reduction achieved
- PSPS exposure reduction
- Schedule performance

Utility Benchmarking:

SDG&E's use of undergrounding in wildfire risk areas is consistent with strategies adopted by other California investor owned utilities operating in similar environments, reflecting industry best practices for wildfire risk mitigation. Benchmarking studies have been conducted both within California and with utilities across the country to support programmatic discussions related to design and construction methods, cost drivers, cost containment strategies, material availability, and customer engagement.

Key cost drivers identified through benchmarking include design depth, terrain, population density, easements, and methods of cover. One of the most significant cost reduction measures implemented has been reducing conduit depth while maintaining safety requirements. Shallower conduit depths reduce trenching requirements, resulting in lower construction costs and shorter installation schedules. Consistent with practices across California utilities, trenching is used in lieu of directional boring, which is typically more costly, and conduit systems are favored over direct buried installations.

Additional opportunities to reduce costs identified through benchmarking include optimized contracting strategies, economies of scale, and the use of existing easements. Utilities nationwide reported experience with undergrounding across a wide range of terrain conditions, including hard rock, flood plains, water crossings, and varying soil types, all of which can significantly affect construction costs and accessibility. Among these, undergrounding in hard rock conditions was consistently cited as one of the most significant challenges for California utilities due to its substantial impact on project cost and schedule and is evaluated within the projects.

To further manage costs and project complexity, utilities emphasized the importance of securing new easements or leveraging existing easements where feasible. In response to these challenges with easements, benchmarked utilities highlighted enhancements to customer outreach and education efforts. These efforts included early and widespread communication through multiple channels—such as door hangers, phone calls, emails, and town halls—as well as direct engagement with local community leaders. This engagement helps with project understanding and supports beneficial conversations with land owners.

Material availability was another common topic of discussion among peer utilities, particularly during periods of supply constraint. For example, shortages of pad mounted transformers in 2023 affected program delivery across the industry. These components are critical to undergrounding programs, and during periods of constrained supply, utilities evaluated the expansion of manufacturing capacity to support program objectives.

Pictures:

Workpaper	Grid Design, Operations, and Maintenance
Category	Distribution Underbuild
WMP Tracking ID	WMP.545

Description	**Distribution Underbuild Program**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	37	168	190	86	368
Capital Expenditures Non-Labor	654	3,243	4,815	2,377	6,704
Capital Expenditures Direct Costs Subtotal	**691**	**3,411**	**5,005**	**2,463**	**7,072**
Capital Expenditures Indirect Costs	342	2,243	3,421	903	3,516
Capital Total	**1,033**	**5,654**	**8,426**	**3,366**	**10,588**
O&M Labor	-	-	-	-	0
O&M Non-Labor	-	-	-	-	0
O&M Direct Costs Subtotal	**-**	**-**	**-**	**-**	**0**
O&M Indirect Costs	-	-	-	-	0
	-	**-**	**-**	**-**	**0**
Units					
Miles*	10	9	3	1	**10.6**
FTE**	0.9	2.3	2.4	1.3	**7.2**
Imputed Authorized Direct Capital $					**537**
Imputed Authorized Direct O&M $					**-**

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	Prior Years Spend				Track 3
	2019	2020	2021	2022	2023
TL692 Horno Pulgas (Camp Pend)					
Capital	**106**	**75**	**2,059**	**159**	**7**
Labor	12	12	66	4	0
Non-Labor	94	63	1,993	155	6
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
TL692 Horno Pulgas (Camp Pend) Total	**106**	**75**	**2,059**	**159**	**7**
TL6912 - San Luis Rey to Camp Pendleton					
Capital	**569**	**2,966**	**281**	**(27)**	**16**
Labor	21	136	13	10	1
Non-Labor	548	2,830	267	(37)	15
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
TL6912 - San Luis Rey to Camp Pendleton Total	**569**	**2,966**	**281**	**(27)**	**16**
TL639 Wood to Steel Replacement					
Capital	**3**	**38**	**83**	**362**	**927**
Labor	0	3	4	11	20
Non-Labor	3	35	79	351	907
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
TL639 Wood to Steel Replacement Total	**3**	**38**	**83**	**362**	**927**
TL6916 Wood to Steel Replacement					
Capital	**(16)**	**65**	**479**	**891**	**25**
Labor	1	8	9	36	2
Non-Labor	(17)	57	470	855	23
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
TL6916 Wood to Steel Replacement Total	**(16)**	**65**	**479**	**891**	**25**
TL636 Wood to Steel Replacement					
Capital	**12**	**61**	**40**	**293**	**15**
Labor	0	2	4	8	0
Non-Labor	11	58	37	284	15
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
TL636 Wood to Steel Replacement Total	**12**	**61**	**40**	**293**	**15**

TL13831 Wood to Steel Replacement					
Capital	**7**	**38**	**135**	**481**	**2,127**
Labor	0	3	2	11	38
Non-Labor	7	35	133	471	2,089
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
TL13831 Wood to Steel Replacement Total	**7**	**38**	**135**	**481**	**2,127**
TL13838 Wood to Steel Replacement					
Capital	**0**	**0**	**102**	**23**	**11**
Labor	-	-	3	1	0
Non-Labor	0	0	99	22	10
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
TL13838 Wood to Steel Replacement Total	**0**	**0**	**102**	**23**	**11**
TL690C Camp Pendleton Wood to Steel					
Capital	**-**	**-**	**8**	**13**	**21**
Labor	-	-	0	2	3
Non-Labor	-	-	8	11	18
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
TL690C Camp Pendleton Wood to Steel Total	**-**	**-**	**8**	**13**	**21**
TL6926 Rincon to Valley Center Fire Hardening					
Capital	**9**	**167**	**1,818**	**269**	**3,925**
Labor	2	3	90	3	304
Non-Labor	7	164	1,728	265	3,621
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
TL6926 Rincon - Valley Center Total	**9**	**167**	**1,818**	**269**	**3,925**
Total	**691**	**3,411**	**5,005**	**2,463**	**7,072**

Business Purpose:

The distribution underbuild program replaced overhead distribution equipment on transmission structures that were part of an overhead transmission hardening program and were part of the existing route. As the transmission hardening program replaced the existing structures with new steel transmission structures, the distribution system on these structures and on the same route were further hardened by replacing aging conductors with new, high strength conductors, expanding spacing between the conductors, and designing the overall structure and all components for known local wind conditions. The distribution underbuild work prioritized hardening work in Tiers 2 and 3 of the High Fire Threat District (HFTD).

Project Justification:

In conjunction with transmission hardening, the distribution underbuild projects selected work to reduce the potential risk of ignition in the HFTD by replacing the existing structures with steel structures and replacing aging conductors with new conductors while designing the structures to known local wind conditions utilizing expanded spacing. In Tiers 2 and 3 of the HFTD, structures are designed to handle known local wind conditions ranging from 85 miles per hour (mph) to 111mph, which reduces the risk of failure during Santa Ana wind conditions. In addition, the use of expanded spacing between conductors reduces the risk of ignition by reducing the potential of wire slap and vegetation or foreign object contact that may result in phase to phase or phase to ground faults. By bundling this distribution underbuild work with the existing transmission hardening work, project costs for the work can be reduced with the need for only a single crew mobilization, a single design of the full structure, and the removal of redundant permitting and approval work.

Project Scope:

The scope of distribution underbuild projects was replacing aging conductors with new, high strength conductors, expanding spacing between the conductors, and designing the overall structure and all components for known local wind conditions. Engineered designs for the projects included the use of steel structures with expanded spacing on the distribution utilizing larger crossarms that allowed for additional pin spacing between conductors. This design validated pin spacing and the structure strength met requirements for both General Order 95 and SDG&E known local wind conditions. In 2023, a total of 10.6 miles of distribution underbuild work was completed. TL639, TL13831, and TL6926 contributed towards the largest scope in 2023 with hardening work and project closeout.

Cost Drivers:

The underlying cost drivers for the program were related to material, design and construction costs and total distribution underbuild mileage. The main driver of the year over year spend corresponds with the total mileage of transmission hardening within the year and the percentage of that hardening work which had distribution underbuild. Material, design, and construction work has been bundled with the transmission to decrease the total cost from independent projects and work is competitively bid to qualified Master Service Agreement (MSA) contractors and suppliers.

Project Timing and Phases:

Each project went through a multi-stage process from initiation to completion. The first stage for all project was the initiation phase where the project team identified the preliminary scope and a high-level estimate for review and approval. At this stage, the initial design criteria and potential permitting requirements were identified. Once approved to move forward with the project, the preliminary engineering begins with the 30% and 60% design stages.

At the 30% design stage, the engineering team's preliminary design focused on the proposed structure locations where replacements would occur, identified stringing sites, and prepared the design for an initial job walk for constructability and any field or construction input. All feedback was then incorporated into the design as it moved into the 60% design stage. The 60% design begins to finalize decisions from the job walk and begins the acquisition of long-lead time material. During this time, the engineering and design team continued to work with environmental and permitting agencies to finalize the necessary scope and construction requirements from a land and impact perspective. After a 60% job walk was scheduled, which included utility mark outs, the job progresses to the 90% job stage.

The 90% design stage was the final stage for all jobs before a package was issued for construction. This stage incorporated any changes from the previous job walks and created a full job package for construction including all material lists, permits, and necessary design or construction specifications. Completion of the 90% design led to the job being issued for construction where a competitive bid process was utilized for all projects. Upon successful award of the contract, contractors scheduled for outages and completed the work as dictated in the job package.

The final stage after construction was the close-out stage. For all projects, this included an internal quality assurance and quality control verification of the final construction to validate the contractor completed all work according to the job package and in compliance with all SDG&E standards and specifications. Prior to contract close-out, contractors made any corrections required and submitted the necessary as-built drawings for utility records. All invoices throughout the process were reviewed by internal SDG&E team members who oversaw the work being performed.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis

A preliminary work order authorization for engineering work was generated. Once each design reached the 60% stage a revised total project cost estimate was generated and a reauthorization for full funding was submitted for review and approval. At this stage, the work scope had been further finalized allowing for a review and approval of more accurate project funding. Throughout this process, SDG&E utilized competitive bidding processes to acquire the necessary resources and material for the design and construction of each project.

Where necessary to support the design and engineering of these projects, SDG&E used qualified engineering contractors that were awarded a contract for these services through a competitively bid Master Service Agreement (MSA). Each project was individually bid amongst these qualified MSA contractors. Material procurement was acquired through SDG&E's Supply Management department which competitively bids products on a regular basis. When the design of the jobs was complete, material had been acquired and the jobs reached the issued for construction state, the work was bid amongst MSA construction contractors who went through a similar bid process to the engineering and design contracts.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program met and exceeded its approved annual WMP targets by completing approximately 10.6 miles of overhead distribution underbuild hardening work in 2023, surpassing the 7-mile target identified in SDG&E's approved 2023-2025 WMP. Unit actuals provided reflect completed projects placed in service and recorded to SDG&E's WMPMA in 2023 and may be different than completed projects reflected in SDG&E's WMP reporting. Planned Capital spend was $11,397,000.

Risk Identification and Mitigation:

SDG&E's Distribution Underbuilt program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how corrective actions on underbuilt circuit configurations reduced wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each segment. This score was then compared against program costs to produce a unitless RSE value that reflected the efficiency of risk mitigation per dollar invested.

Risk identification began with a detailed assessment of circuit-level conditions and operational factors that influenced ignition likelihood and consequence, including historical ignition drivers, vegetation density, terrain complexity, conductor configuration, pole loading, equipment age, circuit criticality, and exposure to environmental hazards. The risks addressed by the program included ignition potential in the HFTD, which was mitigated by replacing aging conductors with new higher-strength conductors and designing structures to known local wind conditions using expanded spacing. This approach reduced wire-slap and contact potential while improving the structural performance of shared transmission-distribution assets during adverse weather. In addition, the program mitigated cost risk by leveraging the same construction crew to replace both transmission and distribution facilities, reducing the likelihood of returning to the same pole in future years to perform similar work. These targeted corrections prioritized circuits with the highest structural, environmental, and operational risk for improvement.

The program's mitigation strategy included engineering evaluations, field validations, and constructability reviews to determine the most effective structural or configuration modifications—such as separating distribution circuits onto independent structures, upgrading poles to address loading concerns, adjusting conductor geometry, or eliminating legacy underbuilt arrangements that elevate ignition exposure. SDG&E supplemented this work with advanced analytics that integrated inspection data, pole-loading models, structural assessments, and system-planning information to identify segments where corrective actions would yield the greatest long-term risk-reduction benefit. This integrated approach supported earlier identification of high-risk configurations, more accurate assessment of ignition potential, and informed decision-making on where corrective actions provide the most durable and cost-effective mitigation.

The following table summarizes key program metrics to demonstrate how the Distribution Underbuilt program contributes to measurable wildfire-risk reduction:

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	2.82	0.0006	0.88	0.01%	7.9
Tier 2	7.78	0.009	8.57	0.15%	28.02
Non - HFTD / WUI	0	---	---	---	---

Consideration of Alternative Solutions:

1. Do nothing – If SDG&E does not perform the distribution underbuild hardening work at the same time as the transmission hardening work, the risk of potential ignition on the transmission would be reduced, but risks from the distribution lines--which has a smaller phase spacing and in some cases, smaller wire size or diameter--would remain. The smaller diameter wire poses additional risk during the transfer and if left in place due to the age and diameter of the wires and the new structure heights needed to maintain transmission and distribution clearances. As variations in new pole heights and locations through the transmission hardening program may change the attachments between distribution structures, the additional loading may cause additional stress on this conductor resulting in potential risk that is reduced through this program. Also, if work were to be completed outside this program and part of a separate project, any future work would require additional analysis, permitting, and construction remobilization.

2. PSPS Event – Due to the location of the work and historical wind speeds, the continued use of PSPS events in this area was considered. New equipment will reduce the potential need for PSPS for the project locations.

Coordination with Similar Programs

The purpose of this program was to be more efficient in combining the distribution underbuild work with the transmission hardening work planned to be completed on the same structures within the existing route. By bundling the distribution underbuild work with the existing transmission hardening work, project costs for the work can be reduced with the need for only a single crew mobilization, a single design of the full structure, and the removal of redundant permitting and approval work. In addition, this removed the need for multiple reviews and site visits for permitting and regulatory agencies that were required to support the existing project. In addition, transmission compliance work that was required to be completed was reviewed to incorporate all work that could be completed while still remaining in compliance with regulatory repair timelines.

Stakeholder Impact and Engagement:

As the distribution underbuild program follows along transmission alignments in 2023, multiple external stakeholders were impacted including but not limited to the Department of Defense (Camp Pendleton and Marina Corps Air Station Miramar), city, county, and federal jurisdictions, and residential customers. During the initial design and scoping of each project, internal stakeholders coordinated directly with external stakeholders to discuss the scope, schedule, and potential impacts of the projects. Coordination included the support of townhalls to inform the public and answer any questions as well as field meetings with the local jurisdictional contacts. During the design stage, the engineering team worked directly with these external stakeholders to minimize impacts with small shifts in pole locations to avoid sensitive areas and communication on timeline and schedule.

Metrics:

10.6 miles of distribution underbuild were hardened in Tier 2 and 3 of the HFTD with expanded spacing and steel structures for projects which had complete project energization in 2023. This work aligned with completion timeline of the transmission hardening work being performed on the same structures. Work on both the transmission and distribution were performed by the same contractor using a single job package to remove duplication of efforts.

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Distribution Overhead System Hardening
WMP Tracking ID	WMP.475

Description	**Distribution Overhead System Hardening Programs**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	9,508	5,349	5,952	1,446	754
Capital Expenditures Non-Labor	114,841	132,007	90,463	20,793	~~2,412~~ 2,365
Capital Expenditures Direct Costs Subtotal	**124,349**	**137,355**	**96,415**	**22,239**	~~**3,166**~~ **3,119**
Capital Expenditures Indirect Costs	26,348	21,312	20,114	9,058	2,630
Capital Total	**150,697**	**158,667**	**116,529**	**31,297**	~~**5,796**~~ **5,749**
O&M Labor	74	181	157	1,255	445
O&M Non-Labor	1,513	3,189	2,245	2,142	649
O&M Direct Costs Subtotal	**1,587**	**3,370**	**2,402**	**3,397**	**1,094**
O&M Indirect Costs	60	44	(25)	620	95
O&M Total	**1,647**	**3,414**	**2,378**	**4,017**	**1,189**
Units					
Miles*	95	96	127	92	**2.33**
FTE**	79.1	44.6	48.2	20.9	**9.1**
Imputed Authorized Direct Capital $					**59,561**
Imputed Authorized Direct O&M $					**5,250**

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
FIRM					
Capital	**2,571**	**(32)**	**3**	**0**	**3**
Labor	129	16	1	0	0
Non-Labor	2,442	(48)	1	0	3
O&M	**663**	**1,969**	**1,041**	**2,351**	**1,209**
Labor	38	119	80	1,051	85
Non-Labor	625	1,850	961	1,301	1,124
FIRM Total	**3,234**	**1,937**	**1,044**	**2,351**	**1,212**
Accelerated Pole Loading					
Capital	**6,247**	**536**	**196**	**2**	**5**
Labor	1,778	104	44	0	1
Non-Labor	4,469	432	152	2	4
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Accelerated Pole Loading Total	**6,247**	**536**	**196**	**2**	**5**
Overhead System Traditional Hardening					
Capital	**115,530**	**136,852**	**96,216**	**22,237**	~~**3,158**~~ **4,656**
Labor	7,601	5,229	5,906	1,446	753
Non-Labor	107,929	131,623	90,310	20,791	~~2,405~~ 3,903
O&M	**924**	**1,401**	**1,361**	**1,045**	**(115)**
Labor	36	62	77	204	359
Non-Labor	888	1,339	1,284	841	(474)
Overhead System Traditional Hardening Total	**116,455**	**138,253**	**97,577**	**23,282**	~~**3,043**~~ **4,540**
Total	**125,936**	**140,726**	**98,818**	**25,635**	~~**4,260**~~ **5,758**

Business Purpose:

The Traditional Hardening (TH) program was a wildfire mitigation initiative. The purpose of the program was to reduce the risk of utility-caused wildfires by strengthening existing overhead distribution infrastructure in high fire-risk areas, primarily within CPUC-designated High Fire Threat District (HFTD) Tier 2, Tier 3, and Wildland Urban Interface (WUI) areas. TH was intended to improve the mechanical and operational resilience of overhead facilities where strategic undergrounding (SUG) or covered conductor (CC) were not selected or feasible.

Project Justification:

Certain overhead distribution facilities in high-fire-risk areas exhibit increased wildfire ignition potential due to aging infrastructure, historical construction practices, and environmental exposure. High winds, vegetation proximity, and legacy pole-loading standards may lead to conductor slap, equipment fatigue, and structural failures that increase the potential for electrical faults and ignition events.

The TH program mitigated these risks by reinforcing, replacing, or upgrading poles, crossarms, insulators, down guys, anchors, and other mechanical components. These upgrades improved structural stability, reduced conductor movement, and strengthened the system's ability to withstand weather and environmental stressors.

Expected outcomes included:
• Lower probability of equipment-related ignition events, especially under extreme wind or heat conditions.
• Reduced likelihood of phase to phase or phase to ground contact.
• Enhanced pole-line performance, reducing unplanned outages and equipment replacements.
• Improved ability to maintain service continuity and reduce reliance on Public Safety Power Shutoffs (PSPS) when paired with automation and sectionalizing devices.
• Consistency with engineering standards that require stronger mechanical loading, improved hardware performance, and updated installation requirements.

This approach provided durable, moderate-effectiveness wildfire-risk reduction where CC or SUG are less feasible, so that no high-risk corridor remains unmitigated within the broader wildfire-hardening portfolio.

Project Scope:

The TH program enhanced overhead distribution infrastructure by strengthening the mechanical components that support conductor and equipment systems.

The scope included:
• Replacing wood poles and wood crossarms with steel poles and fiberglass crossarms, insulators, pins, brackets, down guys, anchors, and other structural hardware.
• Replacing aged, undersized, or deteriorated components to meet current mechanical loading and engineering standards.
• Reinforcing overhead structures to reduce sag, sway, uplift, and other wind driven mechanical forces with additional guying, deeper pole embedment depths, or concrete backfill rather than native soil.
• Completing reconductoring on targeted segments where conductor upgrades provide meaningful improvement to mechanical performance.

Project identification used wildfire risk modeling — including WINGS — followed by detailed engineering analysis, site walks, and constructability review.

Work was delivered at the sub-segment level, typically measured in miles hardened where a typical project was 1-1.5 miles in length. During scoping, equipment which was no longer needed was identified and removed, improving system efficiency and reducing long term maintenance burdens. TH did not include undergrounding or conversion to covered conductor; those mitigations are handled through programs specifically designed for those scopes.

Cost Drivers:

Primary cost drivers for TH were associated with planning, materials, construction execution, project close-out and site specific constraints common in high fire risk areas. Key cost drivers included:

• Field scoping and engineering, including surveys, job walks, design development, and constructability assessments;
• Material procurement, such as poles, crossarms, insulators, hardware, and other overhead system components, with costs subject to market pricing, supplier availability, and lead times;
• Construction labor, including internal and contract resources required to perform overhead work in active distribution environments;
• Environmental review and permitting, where required, including avoidance measures, monitoring, and design modifications driven by environmental or land use constraints;
• Site specific construction conditions, such as hard digging or rock conditions, limited access, steep terrain, and the need for specialized construction methods including helicopter assisted pole setting or material delivery;
• Program management, reporting, and controls, including scheduling, cost tracking, coordination with other mitigation programs, and regulatory reporting.

As a result, costs may vary year over year based on material pricing, supply chain conditions, labor rates, and the changing mix of scope. Unit costs also reflect the increasing complexity of performing overhead system hardening work in constrained and environmentally sensitive HFTD locations.
Under the executed scope, SDG&E completed 2.3 miles of TH work, including reconductoring and permanent OH removals. Remaining work was comprised of structural component upgrades, removal of idle equipment, construction close out, inspections, documentation, and reconciliation of as built conditions.

The variance between the originally authorized TH funding and actual expenditures is the result of a rescoping decision. As described in SDG&E's 2020–2022 Wildfire Mitigation Plan filings, SDG&E identified that TH provides lower wildfire risk reduction effectiveness relative to enhanced mitigations such as CC. Consistent with this finding, SDG&E curtailed further TH construction and redirected funding to CC, rather than continuing to execute lower effectiveness bare wire hardening. This rescoping avoided duplicative work and aligned execution with the most current wildfire risk mitigation priorities.

In 2023 the TH program incurred both O&M and Capital costs, depending on the scope of each project. For reconductor projects, most expenses were Capital since conductor and poles—major properties—were installed, removed, or replaced. However, certain tasks, such as minor installations or replacements not part of a major unit, were classified as O&M. For example, items like installation of pole caps and plugs on existing steel poles, or avian protection that failed, or guy guard replacements that were discovered during job walks were included in the reconductor project and noted as O&M in its accounting treatment. Other TH project types, such as Fast Track (FT) and True Up Remediation (TUR), were mainly O&M since they involved minor work instead of major property installs, removals, or replacements.

Project Timing and Phases:

TH followed a multi-stage, segment-based delivery process that spanned approximately 24–26 months from initial scoping through construction close-out. Stages included:
1. Identification & Prioritization (Months 0–3), included risk modeling, wildfire exposure analysis, and asset condition review, screening against active CC and SUG scope
2. Field Scoping & Engineering (Months 3–18), included detailed site walks, constructability planning, environmental assessments, pole-loading engineering analysis, design development, IFC package preparation
3. Procurement & Pre-Construction (Months 10–20), included ordering of long-lead materials and staging yard mobilization, outage planning, crew & equipment mobilization, permitting & land coordination
4. Construction (Months 18–24), included digging, equipment installation, reinforcement, reconductoring, removal of idle equipment, real-time quality assurance and quality control
5. Post-Construction Close-Out (Months 22–26), included, final inspections, documentation, cost reconciliation, as-built updates

As SDG&E's wildfire-mitigation strategy evolved, certain TH segments were reclassified into CC or SUG. Although full construction was curtailed in these cases, post-construction, remediation, and close-out activities continued to support compliance, reporting, and asset-record accuracy.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program met and exceeded its approved annual targets by completing approximately 2.3 miles of overhead grid-hardening work in 2023, surpassing the 1.9-mile target included in SDG&E's approved 2023-2025 WMP. Planned Capital spend was $1,985,000, planned O&M spend was $1,800,000.

Risk Identification and Mitigation:

Risk identification for TH was informed by SDG&E's wildfire risk assessment methodologies and Risk Assessment and Mitigation Phase (RAMP) framework, which evaluated overhead distribution facilities for conditions that increase the likelihood of wildfire-related events, including exposure to high winds, vegetation interaction, and legacy construction standards. Candidate circuit-segments were identified using wildfire risk modeling, including the WINGS model, and refined through field assessments, engineering judgment, and constructability review. Consistent with the RAMP framework, mitigation options were evaluated using Risk Spend Efficiency (RSE) and benefit-cost considerations, which assess the relative wildfire risk reduction achieved per dollar invested. TH mitigated risk by strengthening overhead infrastructure to reduce the probability of equipment failure, conductor movement, and structural deficiencies that could result in ignition. Based on comparative RSE and benefit-cost outcomes, TH was applied selectively within the wildfire mitigation portfolio, while higher-effectiveness mitigations such as CC and SUG were prioritized where they provide greater risk-reduction value.

SDG&E's TH program applies the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how corrective actions on circuit configurations reduce wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluates safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each segment. This score is then compared against program costs to produce a unitless RSE value that reflects the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics to demonstrate how the TH program contributes to measurable wildfire-risk reduction:

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	1.84	0.00023	0.36	0.00%	~~2.45~~ 2.48
Tier 2	0.49	0.00036	0.34	0.01%	~~8.87~~ 8.96
Non - HFTD / WUI	0	---	---	---	---

Consideration of Alternative Solutions:

1. Do Nothing — Would leave wildfire risk unmitigated, inconsistent with SDG&E's approved WMP.
2. PSPS Deployment — Would temporarily reduce risk but creates reliability, economic, and customer-impact concerns.
3. Other grid-hardening strategies, such as installing covered conductors or implementing strategic undergrounding, that provide superior wildfire-mitigation benefits but also involve significantly longer lead times due to their design, permitting, and construction requirements. TH remained appropriate in segments where CC and SUG are not feasible.

Coordination with Similar Programs

TH was applied only where it provided incremental wildfire risk reduction within the broader grid-hardening portfolio, and where investments were coordinated with CC, SUG, and CMP to maximize portfolio-level Risk Spend Efficiency (RSE) and avoid duplicative or stranded work. Candidate TH segments were reviewed using Geographic Information System (GIS) data against approved and planned SUG and CC scope and long-range capital plans. Steering committees and program-level coordination meetings were created to reconcile scope across teams.

Stakeholder Impact and Engagement:

Stakeholder engagement was conducted as part of project scoping, permitting, and construction planning and included coordination with local jurisdictions, permitting and land use agencies, and affected property owners. Customers and landowners were notified in advance of construction activities, including mailed notices and flyers describing the scope, timing, and expected impacts of work. Sensitive customers and property owners where access to private property was required received direct outreach, including advance phone calls, to coordinate access, address concerns, and minimize disruption. Engagement activities supported environmental compliance, traffic control, outage coordination, and construction sequencing, and were adjusted as needed to reflect changes in scope or mitigation approach, including transitions to CC or SUG. This approach helped minimize customer impacts, facilitated property access, and supported efficient and compliant execution of TH work. Where SUG or CC was authorized, planned, or in late-stage development, TH was de-scoped or deferred to prevent rework or stranded cost.

Metrics:

N/A

Utility Benchmarking:

TH was consistent with industry practices used by California investor owned utilities (IOUs) to mitigate wildfire risk on overhead distribution systems by strengthening legacy infrastructure in high fire risk areas. As reflected in SDG&E's WMP and RAMP filings, IOUs benchmarked overhead hardening effectiveness using comparative risk reduction frameworks, including Risk Spend Efficiency (RSE) and benefit cost considerations, to evaluate how different mitigations perform relative to cost. Benchmarking across utilities indicated that TH provides moderate wildfire risk reduction effectiveness compared to enhanced mitigations such as CC and SUG, which have higher effectiveness but also higher cost and constructability constraints. Consistent with this benchmarking, SDG&E has applied TH selectively where it provides appropriate incremental risk reduction, while transitioning portfolio emphasis toward higher effectiveness mitigations as supported by comparative RSE and benefit cost outcomes. This approach aligned SDG&E's TH strategy with prevailing IOU best practices for risk informed wildfire mitigation investment.

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Microgrids
WMP Tracking ID	WMP.462

Description	**Microgrids**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	77	408	546	249	378
Capital Expenditures Non-Labor	97	2,630	12,404	2,231	972
Capital Expenditures Direct Costs Subtotal	**174**	**3,039**	**12,950**	**2,480**	**1,350**
Capital Expenditures Indirect Costs	147	1,401	7,740	2,277	(176)
Capital Total	**321**	**4,439**	**20,690**	**4,757**	**1,174**
O&M Labor	-	0	32	113	73
O&M Non-Labor	-	377	1,458	1,312	1,169
O&M Direct Costs Subtotal	**-**	**377**	**1,490**	**1,425**	**1,241**
O&M Indirect Costs	-	2	30	103	36
O&M Total	**-**	**378**	**1,520**	**1,528**	**1,277**
Units					
Microgrid*				1	**-**
FTE**	0.8	4.1	5.3	3.2	**5.9**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
WMP Microgrids Program O&M					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**-**	**377**	**1,490**	**1,425**	**1,241**
Labor	-	0	32	113	73
Non-Labor	-	377	1,458	1,312	1,169
WMP Microgrids Program O&M Total	**-**	**377**	**1,490**	**1,425**	**1,241**
WMP Cameron Corners					
Capital	**173**	**2,741**	**10,288**	**1,720**	**264**
Labor	75	323	416	159	97
Non-Labor	97	2,419	9,871	1,560	167
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
WMP Cameron Corners Total	**173**	**2,741**	**10,288**	**1,720**	**264**
WMP Microgrid Ramona					
Capital	**1**	**297**	**2,663**	**760**	**1,086**
Labor	1	86	130	90	281
Non-Labor	0	212	2,533	670	805
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
WMP Microgrid Ramona Total	**1**	**297**	**2,663**	**760**	**1,086**
Total	**174**	**3,415**	**14,441**	**3,905**	**2,592**

Business Purpose:

The Cameron Corners microgrid supports several critical facilities in the rural community of Campo, CA, home to approximately 3,500 residents across 24 square miles. This area, served by Circuit 448, has historically experienced Public Safety Power Shutoffs (PSPS) due to elevated wildfire risk within the High Fire Threat District (HFTD). The Cameron Corners site was selected because it centrally hosts essential community services including medical care, fueling stations, telecommunications infrastructure, schools, and emergency response facilities making it a strategic location for microgrid resilience.

The Ramona Air Attack Base (RAAB) is a Cal Fire facility that supports fire retardant pumping and fueling operations for fixed wing aircraft, and also supports seasonal, 24/7 operations for US Forest Services. The remote controlled, renewable energy microgrid was installed to enhance resiliency during emergencies, including PSPS, since the base is located within the HFTD.

Project Justification:

Once commissioned, the microgrid was expected to significantly reduce PSPS impacts on essential community services. Establishing a stationary, remotely operated system allowed critical facilities to remain powered without the need for onsite personnel, reducing travel time, operational burden, and customer outage duration. The microgrid can perform pre planned transfers without interruption when scheduled in advance of grid events, eliminating unnecessary outages. Beyond PSPS events, the system will also support connected customers during planned maintenance outages.

The long duration storage technology selected for the final design enables sustained renewable operations over multiple days an essential capability for communities in the High Fire Threat District.

Project Scope:

The Cameron Corners Microgrid was constructed in support of the Wildfire Mitigation Program. The final system integrated a long duration vanadium redox flow Battery Energy Storage System (BESS), rated at 4.0 MWh with a maximum output of 580 kW, paired with an 875 kW (AC) solar photovoltaic power plant. Operations and maintenance activities were performed by personnel from the Palomar Energy Center.

The Ramona Air Attack Base was also constructed to mitigate emergencies, including PSPS, in support of the Wildfire Mitigation Program. The final system included a 500kW / 2MWh energy storage system. Both microgrids also include a Local Area Distribution Controller (LADC), which allows for remote control and monitoring of the systems from SDG&E's Distribution Control Center.

Cost Drivers:

For Cameron Corners, major cost drivers included procurement of the new long duration BESS, which required milestone based payments. Portions of the costs were offset through a settlement following the failure of the original battery units to meet performance guarantees.

The upgraded system increased storage duration from 2 hours to 8 hours, improving performance and customer value consistent with results from prior California Energy Commission demonstration project. The project also benefited from eligibility for the standalone storage Investment Tax Credit (ITC), reducing overall cost to customers.

Additional drivers included development of the Site Energy Controller (SEC) to integrate the BESS, inverter, and site controls. Foundation modifications were also needed to accommodate the new system's footprint and weight; portions of this work were offset by the settlement.

In 2023, the implementation and training of the LADC was completed at the Ramona Air Attack Base. The LADC is the microgrid controller that allows for remote control and monitoring of the microgrid from SDG&E's Distribution Control Center.

Project Timing and Phases:

The Cameron Corners project was completed on schedule; however, significant technical challenges emerged with the original energy storage system.

In August 2020, SDG&E contracted to supply six units totaling 500 kW/2,000 kWh with a guaranteed 65% round trip efficiency (RTE) for use during PSPS events. After three years of work and multiple commissioning attempts, the units consistently failed to meet minimum performance guarantees, including power output, energy capacity, and round-trip efficiency. Even with a proposed remediation plan, key performance metrics such as RTE and charging time remained below the thresholds required to reliably support a multiday, fully renewable microgrid operation.

In 2023, SDG&E selected an alternative vendor offering comparable non-lithium technology better suited to long duration storage needs in the HFTD. The utility partnered with a provider originally unable to bid in 2020 due to COVID-19 constraints and executed a series of replacement contracts after settling with the prior vendor.

These included:
• A construction contract for site modifications
• An equipment supply agreement for an 8 hour, 500 kW vanadium redox flow battery
• A controls contract

Although the transition introduced delays, it resulted in an unexpected benefit: the redesigned project qualified for the standalone storage Investment Tax Credit (ITC) under the Inflation Reduction Act, ultimately reducing costs for customers.

The Ramona Air Attack Base completed LADC implementation for remote monitoring and control and achieved Commercial Operation Date on August, 14, 2023, which allows the battery to participate in the CAISO marketplace during blue sky conditions.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.1.2.7. This program did not have a specified target for 2023. Planned Capital spend was $16,576,000, planned O&M spend was $1,652,000.

Risk Identification and Mitigation:

Project Risk:
Microgrids provide a unique benefit to customers, by allowing them to stay connected during PSPS events. It provides direct PSPS risk reduction and reliability improvement. This program does not affect wildfire risk, as it does not directly influence the likelihood or consequence of potential ignitions within SDG&E's service territory.

Execution Risks:
The rural backcountry site presented unique risks, including historical use as a military bombing range and its location near La Posta and Campo tribal lands. SDG&E collaborated closely with Tribal Relations and unexploded ordnance (UXO) safety teams throughout construction for a safe execution.

To mitigate technology risk, SDG&E ultimately selected a vendor with proven performance through prior demonstration projects, providing the final system met both microgrid and CAISO operational requirements.

As part of the Local Area Distribution Controller Implementation, the Distribution Control Center was involved in designing the operator screens, testing the asset in our lab environment, and they were also controlling the asset during on-site commissioning. In addition, operational procedures have been developed to manage the operational hand-off between the Palomar Energy Center, while in the CAISO marketplace, and the Distribution Control Center for forced outages, emergencies and PSPS.

Consideration of Alternative Solutions:

Alternatives evaluated included:
1. Taking no action which would reduce support for key CalFire aerial facility and community groups. During PSPS events, Cameron Corners supports community facilities such as the local middle school, gas and propane stations, branch library (Cool Zone), family medical center, AT&T telecommunications facility, and CalFire Station.
2. Relying on rental fossil fuel generation leading to higher operational costs, greater workforce needs, and longer outage durations
3. Undergrounding electric feeders to the microgrid site and essential customers would be costly
4. Not implementing remote capability would require local control from an operator, during the full operation. In addition, Cameron Corners participates in the CAISO marketplace, which is beneficial to the ratepayer.

Coordination with Similar Programs

The project coordinated closely with Distribution Design and the Electric System Hardening program to identify the least cost, most effective solution. Leveraging the 40% ITC eligibility provided an additional benefit to ratepayers reducing the tax expenses in the revenue requirement.

Stakeholder Impact and Engagement:

SDG&E regularly engaged with community stakeholders and essential service providers throughout the project, communicating schedules, technology updates, and implementation plans. During the construction and transition period, SDG&E provided temporary backup power using fossil fuel generators and a mobile battery to maintain service during planned outages.

Metrics:

Success is measured by reducing PSPS related and planned outage durations for essential services. Cameron Corners supports medical, communications, fuel, educational, and emergency operations that have historically been vulnerable to wildfire related shutoffs. Ramona Air Attack Base supports Cal Fire and US Forest Services. Most specifically, the fire retardant and fueling operations for fixed wing aircraft. Following commissioning, the microgrid has increased community satisfaction and strengthened resilience during adverse weather and PSPS events.

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Advanced Protection
WMP Tracking ID	WMP.463

Description	**Advanced Protection**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	518	907	762	1,130	779
Capital Expenditures Non-Labor	3,072	5,858	3,952	9,592	3,072
Capital Expenditures Direct Costs Subtotal	**3,590**	**6,765**	**4,713**	**10,721**	**3,851**
Capital Expenditures Indirect Costs	1,930	3,469	2,628	5,754	2,716
Capital Total	**5,520**	**10,234**	**7,342**	**16,475**	**6,567**
O&M Labor	-	-	-	59	86
O&M Non-Labor	-	-	-	93	146
O&M Direct Costs Subtotal	**-**	**-**	**-**	**152**	**232**
O&M Indirect Costs	-	-	-	33	39
O&M Total	**-**	**-**	**-**	**185**	**271**
Units					
Circuits*	2	3	5	3	**4**
FTE**	6.4	11.9	11.6	23.0	**22.0**
Imputed Authorized Direct Capital $					**11,494**
Imputed Authorized Direct O&M $					**-**

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Advanced Protection					
Capital	**3,590**	**6,765**	**4,713**	**10,721**	**3,851**
Labor	518	907	762	1,130	779
Non-Labor	3,072	5,858	3,952	9,592	3,072
O&M	**-**	**-**	**-**	**152**	**232**
Labor	-	-	-	59	86
Non-Labor	-	-	-	93	146
Advanced Protection Total	**3,590**	**6,765**	**4,713**	**10,873**	**3,851**

Business Purpose:

The Advanced Protection Program (APP) aims to deploy advanced protection technologies in electric substations and distribution systems to reduce fire risk, improve situational awareness in fire-prone areas, and support new relay standards where protection coordination is challenged by low fault currents from high-impedance faults.

Project Justification:

All substations and circuits affected by this program fall within the High Fire Threat Districts (HFTD). The APP program upgrades distribution relaying and associated breakers at these substation locations and improves system visibility for operators. It facilitates the implementation of new relay standards with improved coordination in locations where device coordination is difficult due to lower fault currents. Relays unable to operate during a low fault current event, have led to energized wire on the ground for a long duration. Once field devices are upgraded, it allows for communication between field devices and substation feeder relays.

Project Scope:

The program's objectives are to replace aging equipment, enhance distribution reliability, and improve fire safety in Tier 2 and 3 High Fire Threat Districts (HFTD) through the following upgrades:

- Reconfiguration of 12kV circuit breakers and relays to meet reliability and safety standards
- Installation of Distribution SCADA Remote Terminal Units (RTUs)
- Installation of new transformer bank relays
- Installation of new 12kV bus differential relays
- Installation of microprocessor feeder relays
- Installation of advanced protection devices that enhance feeder protection, reduce fire risk, and enable:
  - Falling Conductor Protection (FCP)
  - Arc Sensing Technology (AST)
  - Advanced Sensitive Ground Fault (SGF) sensing
  - Advanced Remote Event Retrieval (ARER)
  - Remote setting changes

Cost Drivers:

The underlying cost drivers for this capital project relate to construction labor rates, material costs, and the number of circuits having Advanced Protection enabled each year. The unit cost per circuit is expected to be reduced each year as the larger substation equipment is installed, and the remaining circuits require less equipment for installation. O&M costs are related to construction activities to replace and repair minor items of property.

Project Timing and Phases:

Typical project timeline duration from initial scoping to project closeout was approximately 12-18 months and was typically completed in one contiguous phase. Milestones included project scoping, design review gates, permit coordination, issue for construction (IFC) packages, geographic information system (GIS) mapping, material procurement, construction, post construction quality assurance/control inspection, as-built drawing documentation, and work order close-out. Major dependencies were related to coordination of permits, construction crew scheduling, and weather or holiday related event schedule delays.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Approved WMP Annual Targets (units and spending explanation, as needed):

The program completed 4 of the 5 circuits identified in SDG&E's approved 2032-2025 WMP. Planned capital spend was $9,706,000, planned O&M spend was $300,000.

Risk Identification and Mitigation:

Risk identification for SDG&E's Advanced Protection program began with a focused assessment of circuit-level conditions and operational factors that influence both ignition likelihood and consequence. This included reviewing historical fault and ignition drivers, vegetation and terrain conditions, conductor configuration, device placement, equipment age, circuit criticality, and exposure to elevated fire-weather hazards within the HFTD. The risks identified and mitigated through the program included, but were not limited to: (1) high-impedance fault and energized wire-down ignition risk; (2) substation or distribution equipment failure; (3) excessive fault energy and wide-area fault exposure; and (4) situational-awareness gaps that can affect protection performance in HFTD conditions. This evaluation prioritized circuits with the highest operational and environmental risk profiles for protection-system enhancements.

The program's mitigation strategy involved deploying advanced protective devices and settings—such as fast-trip profiles, recloser blocking, enhanced ground-fault detection, and improved sectionalizing—to shorten fault duration, reduce fault energy, and limit re-energization during high-risk periods. Engineering evaluations, coordination studies, and field validations were performed to determine the most effective protection-system modifications for each segment. SDG&E supplemented this work with analytics that integrate inspection data, system-planning information, and protection-event histories to identify locations where updated protection schemes would deliver the greatest long-term risk-reduction benefit.

SDG&E's Advanced Protection program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi Attribute Value Function (MAVF) methodology, to quantify how this program reduces wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition risk reduction to develop a normalized risk reduction score for each segment. This score was then compared against program costs to produce a unitless RSE value that reflected the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics that demonstrate how the Advanced Protection program contributes to measurable wildfire-risk reduction.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	4	0.054	84.72	0.87%	479.63
Tier 2	0	0	-	0.00%	-
Non - HFTD / WUI	0	---	---	---	---

Consideration of Alternative Solutions:

1) Accept higher potential ignition risk from energized wire-downs by relying solely on traditional protection (non-APP), which cannot detect or de-energize a broken conductor prior to ground contact.
2) Accept increased customer impacts and larger PSPS footprints by only depending on operational mitigations rather than improving protection speed and selectivity.
3) Rely on grid hardening efforts, such as covered conductor and undergrounding, as the only mitigation but potential ignition risks remain on overhead segments.

Coordination with Similar Programs

APP and Early Fault Detection (EFD) programs were managed and scoped together, reducing redundant coverage, streamlining deployment costs, and ultimately requiring fewer crew resource deployments. Together, these programs address both the precursor conditions (EFD) and the fault-response needs (APP) associated with wildfire-related ignition risks, creating a more comprehensive mitigation strategy.

Stakeholder Impact and Engagement:

SDG&E communicated with the public and our customers via our wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted mailers and/or door tags to provide additional information to specific customers if they were affected by fielding or construction activities.

Metrics:

SDG&E set a goal of 5 circuits in 2023 and completed 4 circuits. 1 circuit did not get completed due to material sourcing delays.

In late 2022, the EFD Program transitioned out of the APP and was established as a standalone program with a distinct budget code. The program realignment shifted ongoing EFD work and associated actuals from APP to the EFD budget, but the authorized dollars were not correspondingly broken out of APP. This created a structural variance: APP shows an underspend when compared to its authorized amount, not due to execution shortfalls but because a portion of the expected APP activity and spend now resides in EFD while APP retained the original authorization. SDG&E is only seeking recovery of the net incremental cost.

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Early Fault Detection
WMP Tracking ID	WMP.1195

Description	**Early Fault Detection**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	21	182	238	195
Capital Expenditures Non-Labor	-	24	1,555	1,633	672
Capital Expenditures Direct Costs Subtotal	**-**	**45**	**1,737**	**1,871**	**867**
Capital Expenditures Indirect Costs	-	36	675	1,937	819
Capital Total	**-**	**81**	**2,413**	**3,808**	**1,686**
O&M Labor	-	-	-	0	3
O&M Non-Labor	-	-	-	1	1
O&M Direct Costs Subtotal	**-**	**-**	**-**	**1**	**4**
O&M Indirect Costs	-	-	-	0	1
O&M Total	**-**	**-**	**-**	**1**	**5**
Units					
Nodes*	-	-	-	64	**30**
FTE**	-	0.2	1.4	1.8	**1.4**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Early Fault Detection					
Capital	**-**	**45**	**1,737**	**1,871**	**867**
Labor	-	21	182	238	195
Non-Labor	-	24	1,555	1,633	672
O&M	**-**	**-**	**-**	**1**	**0**
Labor	-	-	-	0	3
Non-Labor	-	-	-	1	1
Early Fault Detection Total	**-**	**45**	**1,737**	**1,872**	**867**

Business Purpose:

The Early Fault Detection (EFD) Program aimed to detect what are known as incipient faults on the system with enough time to locate and potentially fix or replace equipment prior to it permanently failing and becoming an ignition source. These incipient faults occur on failing pieces of equipment before they fail violently and become potential ignition sources.

The program reduced wildfire and outage program risks through identification and prediction of failures before they occurred using radio frequency analysis, power quality monitoring technology, and advanced multi-sensor edge analytics technology. These enhancements enabled detection of electrical, physical, and environmental anomalies that traditional systems often miss, such as high-impedance faults (HIFs), vegetation contact, and structural degradation. By leveraging real-time alerts and precise fault localization, the program significantly improved situational awareness and response times, reducing ignition risk and outage duration.

Project Justification:

Deploying Advanced Radio Frequency Sensors (ARFS), Power Quality (PQ) Meters, and multi-sensor edge technologies in SDG&E electric substations and electric distribution circuits within the High Fire Threat District (HFTD) has enabled the collection of time-series analog data. This data can then be used to detect incipient failures of electrical equipment, which allowed SDG&E to locate that failing equipment before it actually fails which can cause more significant damage.

Project Scope:

The EFD Program encompassed the deployment of three primary technologies, ARFS, PQ Meters, and advanced multi-sensor edge analytics technology across circuits located within HFTD.

Physical activities included:
• Installing ARFS sensors at approximately 2.5 mile intervals along selected circuits, covering all three phases from substation boundaries to the furthest branches.
• Deploying PQ meters at substations and field locations, including wiring, relay installation, and communication hardware setup.
• Upgrading existing PQ nodes and integrating new monitoring equipment into the network.
• Installing advanced multi-sensor edge analytics technology including device installation, communication hardware, and integrating the new monitoring equipment into the network..

The technical scope focused on implementing advanced monitoring and analytics capabilities to improve system reliability and reduce fire risk. Key technical components included:
• ARFS technology for continuous radio frequency monitoring of partial discharge, enabling early detection of deteriorating components.
• PQ meters for high-resolution monitoring of power quality, fault location, and predictive analytics across transmission and distribution systems.
• Integration of communication networks, back-office systems, and time synchronization protocols for an accurate and timely data flow.
• Deployment of software tools for signal filtering, data validation, and risk assessment reporting.

Cost Drivers:

The underlying cost drivers for this capital project are related to construction labor rates, material costs, and the number of circuits having Early Fault Detection enabled each year. The unit cost per circuit is expected to be lower once larger substation equipment is installed, and the remaining circuits require less equipment for installation.

Project Timing and Phases:

Typical project timeline duration from initial scoping to project closeout was approximately 12 months and was completed in one continuous phase. Milestones include project scoping, work order and budget creation, design review gates, permit coordination, issue for construction (IFC) packages, geographic information system mapping, material procurement, construction, post construction quality assurance and quality control inspection, as-built drawing documentation, and work order close-out. Major dependencies was related to coordination of permits, construction crew scheduling, and weather or holiday related event schedule delays.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program completed 30 nodes out of the 60 nodes included in SDG&E's approved WMP annual target. Unit actuals provided reflect completed projects placed in service and recorded to SDG&E's WMPMA in 2023 and may be different than completed projects reflected in SDG&E's WMP reporting. Planned Capital spend was $5,612,000, planned O&M spend was $9,000.

Risk Identification and Mitigation:

Risk identification for SDG&E's Early Fault Detection (EFD) program began with a focused assessment of circuit-level conditions and operational factors that influenced both ignition likelihood and consequence. This included reviewing historical fault and ignition drivers, vegetation and terrain conditions, conductor configuration, device placement, equipment age, circuit criticality, and exposure to elevated fire-weather hazards within the High Fire-Threat District (HFTD). The risks identified and mitigated through the EFD program included, but were not limited to: (1) public-safety risks involving energized equipment, reduced by eliminating failing equipment prior to end-of-life; (2) equipment-related ignition risk in HFTD areas, addressed through early identification and proactive replacement of deteriorating or failing assets; (3) unplanned outages and associated impacts to System Average Interruption Duration Index (SAIDI), mitigated by proactively identifying and replacing failing equipment before it fails; and (4) non-compliance with State and Federal regulations—including FERC, NERC, WECC, and GO-95—which could result in fines and other penalties. With EFD, equipment was identified prior to failure which provides compliance with GO95 rule 48 in addition to compliance with reliability standards of the utility governing bodies.

The program's mitigation strategy involved deploying monitoring, diagnostics, and analytics to detect abnormal asset conditions earlier and with greater precision, enabling targeted maintenance or replacement before failure. EFD measures included sensor installations, condition-based monitoring, enhanced testing protocols, protective device setting adjustments and integration of asset-health indicators into operational dashboards and work management systems where appropriate. Engineering evaluations, coordination studies (as needed), and field validations were performed to confirm findings and determine the most effective corrective actions. SDG&E supplemented this work with analytics that integrated inspection results, event histories, and system-planning information to identify locations where early detection and intervention would deliver the greatest long-term risk-reduction and reliability benefit.

SDG&E's Early Fault Detection program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how the program reduces wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each targeted segment or asset class. This score was then compared against program costs to produce a unitless RSE value that reflected the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics that demonstrate how the Early Fault Detection program contributes to measurable wildfire-risk reduction and reliability improvement.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	12	0.062	97.23	1.00%	6,450.48
Tier 2	12	0.031	29.83	0.54%	1,978.98
Non - HFTD / WUI	6	---	---	---	---

Consideration of Alternative Solutions:

During the evaluation process, factors such as detection sensitivity, false-positive rates, integration requirements, communication reliability, and long-term vendor support were assessed.

- SDG&E looked at manufacturer products, and many did not yet demonstrate the level of field-validated performance necessary for deployment at scale.
- SDG&E has also evaluated the option not taking action but this option provides risk with higher costs from replacing equipment post failure in contrast to at incipient failure and being an ignition source.

Coordination with Similar Programs

Advance Protection Program (APP) and EFD programs were managed and scoped together to reduce redundant coverage, streamline deployment costs, and minimize the number of separate crew deployments. Coordinating these programs also assisted with the technologies complementing one another, EFD identifying early-stage equipment degradation and APP detecting falling conductor events providing a more comprehensive protection strategy

Stakeholder Impact and Engagement:

SDG&E communicates with the public and our customers via our wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted mailers and/or door tags to provide additional information to specific customers if they will be affected by fielding or construction activities.

Metrics:

SDG&E set a goal of 60 nodes in 2023 and completed 30 nodes.

The EFD Program was separated from the APP in late 2022. SDG&E is only seeking recovery of the net incremental cost.

Potential Failures

Substation	Circuit	Finding Event Date	HFTD	Damage Type	SDG&E Comments
Jamacha	75	9/11/2023	Tier-3	Crossarm Tracking	Tracking on 12kV arm & birds nest
Jamacha	75	9/11/2023	Tier-3	Cracked Insulator	Cracked insulator
Jamacha	75	9/11/2023	Tier-3	OH Conductor	Evidence of wire slap
Lilac	350	9/5/2023	Tier-3	Crossarm Tracking	Severe crossarm tracking and transformer insulator burn
Lilac	350	9/8/2023	Tier-3	Crossarm Tracking	Tracking on crossarm

Utility Benchmarking:

SDG&E underwent ongoing collaboration with peer utilities to exchange lessons learned, compare deployment methodologies, and stay informed about the latest advancements in EFD technology and operational practices. Findings from these activities were shared across internal engineering, planning, and operations teams aligning on system needs, deployment criteria, and long-term asset strategy.

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Distribution Comms Reliability Improvements & Trans Fiber Links HFTD
WMP Tracking ID	WMP.549

Description	**Distribution Communications Reliability Improvements**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	30	150	146	95	323
Capital Expenditures Non-Labor	662	21,833	26,456	11,886	41,864
Capital Expenditures Direct Costs Subtotal	**692**	**21,983**	**26,602**	**11,982**	**42,186**
Capital Expenditures Indirect Costs	333	2,548	2,431	1,507	2,000
Capital Total	**1,025**	**24,532**	**29,033**	**13,488**	**44,186**
O&M Labor	-	-	-	0	0
O&M Non-Labor	-	-	-	714	910
O&M Direct Costs Subtotal	**-**	**-**	**-**	**715**	**910**
O&M Indirect Costs	-	-	-	2	3
O&M Total	**-**	**-**	**-**	**716**	**913**
Units					
Base Stations*	-	15	10	21	**12**
LTE Communication Network*	-	-	-	1	**-**
FTE**	0.2	1.1	1.0	0.7	**2.2**
Imputed Authorized Direct Capital $					14,349
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
WMP IT - DCRI					
Capital	**-**	**18,315**	**14,956**	**8,253**	**6,284**
Labor	-	24	-	3	170
Non-Labor	-	18,290	14,956	8,250	6,114
O&M	**-**	**-**	**-**	**714**	**910**
Labor	-	-	-	-	-
Non-Labor	-	-	-	714	910
WMP IT - DCRI Total	**-**	**18,315**	**14,956**	**8,968**	**7,194**
Private LTE Spectrum WMP					
Capital	**19**	**68**	**6,490**	**386**	**32,172**
Labor	0	3	9	8	27
Non-Labor	19	64	6,480	378	32,145
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Private LTE Spectrum WMP Total	**19**	**68**	**6,490**	**386**	**32,172**
Trans Fiber Links HFTD					
Capital	**673**	**3,601**	**5,156**	**3,343**	**3,730**
Labor	30	123	137	84	125
Non-Labor	642	3,479	5,019	3,258	3,605
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Trans Fiber Links HFTD Total	**673**	**3,601**	**5,156**	**3,343**	**3,730**
Total	**692**	**21,983**	**26,602**	**12,696**	**43,096**

Business Purpose:

Distribution Communication Reliability Improvements (DCRI) and Private LTE Spectrum:
The purpose of the Distribution Communication Reliability Improvements (DCRI) (private LTE) initiative was to establish the communications foundation required to support SDG&E's wildfire-mitigation operations in the High Fire-Threat District (HFTD) and Wildland Urban Interface (WUI). Field operations, protection systems, and situational-awareness tools deployed in these areas require continuous, low-latency, and secure communication to function as intended. Commercial carrier networks do not provide consistent coverage or sustained performance in rural and mountainous locations, and their availability can degrade during Santa Ana conditions when fire risk and operational demands are highest.

This initiative addressed those limitations by deploying a utility-owned communications platform that remains available during grid instability, environmental stress, and Public Safety Power Shutoff (PSPS) conditions. The system provides the bandwidth, latency, and resiliency needed to support wildfire-mitigation technologies such as Falling Conductor Protection, Covered Conductor monitoring, SCADA and automation on wildfire-mitigation circuits, and inspection and vegetation-management workflows. The network also supports operational functions including EOC coordination, field-crew communication during fire-weather events, and patrol and restoration activities in de-energized areas.

The business need was to enable SDG&E to maintain reliable operational visibility during elevated fire-weather events and communications with personnel working in remote HFTD and WUI areas where commercial coverage is limited. Without a communications platform capable of sustaining performance under these conditions, protection systems may experience delayed data exchange, field crews may have reduced ability to relay conditions, and PSPS decision-making and restoration could be affected by incomplete or delayed information. The objective of this workstream was to provide a stable, scalable, and utility-controlled communications layer that supported both current and future wildfire-mitigation technologies and enables safe, coordinated operations during high-risk conditions across the HFTD and WUI.

TransFiber Link:
This project installed, upgraded, and expanded SDG&E's fiber-optic communication system to support Electric System Protection, Automation, and Controls for Transmission and Distribution circuits. Securing the fiber-optic communications network was required for transporting large amounts of data at high speed to support Falling Conductor technology, Condition-Based Maintenance (CBM), Wide Area Measurement and Control (Synchrophasor/Phasor Measurement), Op/Ex 20/20, video security and surveillance, weather stations, Smart Grid functions, as well as communications with personnel over a company-owned network.
Currently, there are still substations using Telephone Company leased circuits and copper wire for protective relaying and SCADA. These circuits are old, unreliable, and do not meet communication requirements for the new digital protective relay systems being deployed.
The new fiber-optic cable system provides communications-media diversity for protective relaying throughout the SDG&E service territory. System protection is a key function in the electrical power grid, guarding against conditions that could severely damage electric infrastructure and cause extended outages. Highly reliable and available communication links are essential to ensuring protective relaying performs as designed in the event of a system fault.
By replacing aging infrastructure, eliminating reliance on leased copper circuits, and enabling real-time, high-speed exchange of operational data, this project strengthens SDG&E's protection systems, reduces the likelihood of equipment failures that could lead to ignitions, and enhances overall public safety and grid reliability.

Project Justification:

Distribution Communication Reliability Improvements (DCRI) and Private LTE Spectrum: The DCRI project was essential to enable the reliable, low-latency wireless communications required to support SDG&E's wildfire-mitigation protection and monitoring systems deployed in the High Fire-Threat District (HFTD) and Wildland Urban Interface (WUI), including Falling Conductor Protection, wireless fault indicators, advanced protection schemes, enabling grid monitoring, real-time monitoring of distribution devices, and future wildfire-related automation and sensing technologies. The communications and network technologies implemented under the DCRI program was thoroughly tested and validated against the performance requirements of each supported wildfire-mitigation application, including latency, availability, throughput, resiliency, and behavior under degraded and stressed operating conditions. These evaluations demonstrated that commercial carrier wireless networks do not provide sufficient coverage in the remote, rural, and mountainous areas where these wildfire-mitigation technologies are deployed, nor can they reliably deliver the deterministic low latency, high availability, cyber security levels and traffic prioritization required for protection systems that depend on near-real-time data exchange.

Additionally, commercial networks are subject to congestion and service degradation during emergency events and extreme fire-weather conditions, introducing unacceptable operational risk. By deploying a utility-owned communications platform, SDG&E established a resilient and controllable network capable of sustaining performance during adverse weather, grid instability, and Public Safety Power Shutoff (PSPS) conditions. This communications foundation ensures that wildfire-mitigation systems operate as intended, supports timely situational awareness and decision-making, and enables safe, coordinated field operations during elevated fire-risk conditions, reflecting SDG&E's commitment to maintaining robust and reliable communications in the areas of greatest wildfire exposure.

During PSPS (Public Safety Power Shutoff) or other emergencies, we have demonstrated that the communication available through the DCRI program has remained available and reliable, as all public cellular service were down and satellite communications were heavily impacted causing interruptions and non-reliable means of communications. We have real-time data that show this is applicable for a 12-hour outage that was experienced in our territory.

Trans Fiber Link:
The project provided a self-healing network to carry multi-gigabit data on demand. The microwave network was also upgraded or replaced with a higher-bandwidth Long-Term Evolution (LTE) system, which was key for real-time applications. This work created a robust and diverse backbone Synchronous Optical Network (SONET) consisting of fiber-optic, high-speed digital microwave, and LTE wireless technologies.

Modern protection relays required high-speed, dependable, and secure communication for protection and control. At the time, SDG&E's existing communication infrastructure was incomplete and inadequate for upgrading protection of transmission lines on various circuits, compromising protection reliability and security. SDG&E's communications infrastructure did not provide the quality of service necessary to meet the demands of modern protection equipment.

This project continued the installation of fiber-optic communications on 69 kV, 138 kV, and 230 kV transmission lines to connect substations and facilities with a communications transport layer that supported safe and reliable grid operation. A company-owned network reduced reliance on telecom company circuits that were being phased out and positioned SDG&E for future automation applications such as battery-storage facilities and others.

Distribution Communication Reliability Improvements (DCRI) and Private LTE Spectrum:
The DCRI project encompassed multiple technology components, essentially the project necessitates the construction of base stations, the procurement of spectrum, and centralized systems that connect the wireless communications back to the central points where the data is crucial for effective, rapid response to any mitigation efforts on our distribution/transmission lines. In 2023, the project built 12 base stations along with the final acquisition of the spectrum. This consists of new fire-retardant steel poles, foundation work, cabling, backhaul to the sites, and cabinets. Additional components of scope include cellular antennae and network communication equipment (Switches, routers and Radio Access Points). Once all is installed, configuration and fine tuning of radio frequencies is required to ensure optimum coverage. During this time frame, work was performed on engineering and design on not only the identified projects for 2023 but, the up coming projects identified for installation in the planned future as each base station can take between 1-4 years before installation. Prior to 2023, the scope included not only base station installations but the build up of the core technology to enable communication. Acquisition of the spectrum began in the initial phase with approvals through the FCC finalized during 2023.

TransFiber Link:
These projects were identified by SDG&E's Wildfire Mitigation Plan (WMP). There were six projects at various stages of engineering and six Issue for Construction (IFC) ready projects that connected substations with fiber optic connectivity via existing transmission circuits not planned for upgrades such as new transmission lines or wood to steel/re conductor projects that included fiber if it was not already installed. Installations primarily utilized transmission line rights of way and facilities. Engineering work used standards and engineering designs that were developed and continually enhanced from previous fiber optic cable installations. Due to internal resource constraints and to meet schedule and budget goals, Engineering utilized experienced engineering contracting firms to engineer and design the fiber optic installations. The SDG&E Transmission Engineering & Design team provided oversight and review of the engineering and design. The Program Management team provided coordination of material procurement, permitting, environmental surveys and monitoring, construction, and all stage gate deliverables.

Two primary types of single mode fiber optic cable were utilized:
• All Dielectric Self Support (ADSS), for under build on wood and steel poles or towers, and underground installations.
• Optical Ground Wire (OPGW), installed new or used to upgrade existing Overhead Ground Wire (OHGW) on steel poles and towers.

Installations sometimes required replacement of existing wood poles to meet loading or GO 95 clearance requirements. Some installations required transmission line outages for construction. All construction, Caltrans, and traffic control permits were obtained.

Cost Drivers:

DCRI program:

The work scoped for 2018 and 2019 was completed, but subsequent engineering review and operational experience demonstrated that the initial network design did not provide sufficient coverage or performance to support the full set of fire risk reduction technologies deployed in future years as part of the approved WMP. Expansion of the communications network across the HFTD and WUI was required once field deployments showed that reliable, low latency, and cybersecure connectivity could not be achieved within the original footprint. The DCRI program therefore directed its 2020 through 2023 activities toward extending coverage in these areas and addressing system demands that arose as new technologies with higher performance requirements were placed into service. Tower construction did not progress at the same rate as the deployment of these technologies, which required SDG&E to accelerate base station builds to maintain the communications performance needed for operational use. Engineering analysis further determined that the frequencies initially available to the system could not provide the bandwidth, latency, or geographic coverage required in the HFTD and WUI, leading to the acquisition of additional FCC regulated spectrum to meet those requirements.

Base Stations: Base stations are a major cost component of the DCRI program because each site requires new steel fire retardant poles, foundations, cabling, backhaul, cabinets, antennas, network equipment, and RF studies to achieve reliable performance in the HFTD and WUI. While the 2018 and 2019 work established an initial footprint, subsequent engineering showed that the expanded deployment of fire risk reduction technologies and the challenging terrain in the HFTD and WUI could not be supported by the original station plan. As SDG&E built farther into areas with steep elevation changes, canyons, and dense vegetation, it became clear that additional base stations were necessary to provide low latency, dependable communication across the full territory. These installations were not replacements or corrections, but necessary to meet newly identified coverage and performance requirements.

Spectrum: Spectrum purchases are a necessary component for meeting the reliability, low latency, and cybersecurity requirements of grid operations and monitoring to effectively enable the fire-reduction technologies. Dedicated spectrum provides SDG&E with exclusive use of FCC regulated frequency bands, which prevents interference from external users and ensures a stable, secure channel for the transmission of fire risk reduction data. During 2018 and 2019, the program secured its first spectrum license to support the initial PLTE deployment. Initially operated under a Special Temporary Authority (STA) granted by the FCC, this STA was limited in scope, covering only a small number of locations in the Borrego Springs area. As SDG&E expanded its wildfire mitigation efforts under the Wildfire Mitigation Plan (WMP) the need for broader, business-critical communications capabilities across High Fire Threat Districts (HFTDs) became clear However, once field deployments expanded into the HFTD and WUI, engineering analysis demonstrated that the topology, vegetation density, terrain variation, and distance requirements in these areas could not be reliably served by the original spectrum alone. Additional low latency and high bandwidth capability was required to ensure full coverage and to meet the performance needs of the newer fire risk reduction technologies being deployed throughout the territory. As a result of these newly identified requirements, SDG&E pursued and received the necessary approvals to acquire a second spectrum license in 2023. This second license was not a replacement for the initial spectrum, nor was it purchased to remedy deficiencies in earlier work. Instead, it was an incremental expansion needed to allow the system to operate effectively across the full HFTD and WUI environment. Both spectrum licenses are now actively used within the PLTE system and together provide the operational flexibility, bandwidth, and geographic coverage needed to support the full suite of WMP technologies..

Core and End Points: Another cost driver, although smaller, is updates that were needed on the core centralized system that manages the overall communication of the PLTE system, along with installing RAN (Radio Access Nodes) to enable communications at end devices. As increased fire-risk reduction technologies have been identified and their increased data transmission needs for effective monitoring and response, the necessity to upgrade the initial core and add end points has increased in this area. These components ensure reliable communications and ensures that we are actively using the full capabilities of the PLTE network itself and effectively enabling the fire risk reduction technologies.

Trans Fiber Link:

The Trans Fiber Link work required activities across several disciplines. Land Services staff performed property research, acquired necessary easements, coordinated with property owners, conducted title reviews, supported permitting, and finalized land-rights documentation. Environmental teams conducted biological and aquatic surveys, completed environmental impact assessments, monitored mitigation requirements, evaluated cultural resources, and performed work associated with CEQA and NEPA compliance. Distribution Engineering personnel conducted field assessments, completed design reviews, performed system modeling and load checks, developed construction plans, and coordinated with construction planners. Project Management staff oversaw the project schedule, risks, scope, stakeholder coordination, financial tracking, and all close-out reporting. Engineering and design resources prepared detailed overhead and underground construction drawings, performed structural analysis for poles, towers, and substation components, completed surveying and GIS updates, provided civil, electrical, and environmental engineering support, and assembled design packages for permitting, procurement, and construction in accordance with SDG&E and CPUC requirements under GO-95 and GO-128.

Construction activities included below-grade substation work such as conduit installation, trenching, grounding grids, foundations, vaults, and duct banks; overhead line construction including pole setting and removal, conductor installation, framing, guying, and hardware installation; and substation connection work involving terminations, risers, switches, protection integration, and other tasks required to tie new or rebuilt lines into existing substations. Materials procurement covered all physical components required to construct, upgrade, or modify transmission and distribution facilities. These materials included OPGW and ADSS fiber, connectors such as splices, dead-ends, and insulated connectors, and hardware assemblies including crossarms, brackets, bolts, insulators, jumpers, and guying equipment. Pole replacement materials included wood, steel, or composite poles, associated grounding and hardware, and pole-mounted equipment. Reconductoring materials included new conductors, splice kits, sleeves, dead-ends, and spacer dampers where applicable. Distribution under-build materials were procured as needed to install or relocate distribution circuits beneath transmission lines and included primary and secondary conductor, racks, arms, brackets, and insulator assemblies. Joint-use pole modification materials were procured to accommodate communications or third-party attachments and included taller poles, transfer hardware, additional arms or brackets, and components required to restore clearance compliance.

Project Timing and Phases:

Distribution Communication Reliability Improvements (DCRI) and Private LTE Spectrum:

Each year, a number of towers and upgrades were identified for the year. Each antennae installation/tower build can take between 1-4 years for full installation depending on where the site is and permitting approval processes. The base stations installed within the Track 3 time period had Engineering and design work that was started in previous years. The phases of the project include 40% engineering/design with approvals and QA reviews taking place before moving past this stage gate, 60% engineering design approval with the same QA review/feedback and approvals, 80% engineering design approval with the same QA review/feedback and approvals, before moving to final stage of construction.

2019: Initial year used to evaluate HFTD and WUI territory; develop schema mapping of area for targeted base stations that would provide optimal coverage. Engage FCC and teams for spectrum acquisition. Engineering, design and permitting begun on identified locations for base station installations.

2020: 15 base stations installed and operational; continued work towards the acquisition of the spectrum, engineering, design and permitting continuing on an identified 100+ base station sites.

2021: 10 base stations installed and operational; delays experienced with internal engineering teams, along with permitting on sites for construction initiation. Continued work towards the acquisition of the spectrum, engineering, design and permitting continuing on an identified 120+ base station sites. Radio Access Nodes distributed along installed base station locations; along with core maintenance requirements.

2022: 21 base stations installed and operational; continued work towards the acquisition of the spectrum with initial payment, engineering, design and permitting continuing on an identified 100+ base station sites. Radio Access Nodes distributed along installed base station locations; along with core maintenance requirements.

2023: 12 base stations installed and operational; continued work towards the acquisition of the spectrum with initial payment, engineering, design and permitting continuing on an identified 100+ base station sites. Radio Access Nodes distributed along installed base station locations; along with core maintenance requirements.

TransLink Fiber:
In 2023, the Trans Fiber Link initiative advanced several project segments totaling 11.5 miles of fiber installed, with 5.6 miles placed in-service (ISD) during the year. Across all projects, a combined three poles were installed to support fiber deployment, with the majority of segments requiring no new pole construction. The TL6916 segment contributed 2 miles of installed fiber, all of which were placed in service during 2023, and did not require any pole installations. The TL6904 AI-LL segment accounted for 2.6 miles of installed fiber and was the only project area requiring new poles, with three poles installed to enable the route. The TL6930 ES-OV segment added an additional 3.3 miles of installed fiber and required no new poles. Finally, the TL6945 OV-LHP Station segment completed 3.6 miles of installation, with the full segment also entering service in 2023 and no pole installations needed.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy.

DCRI: SDG&E competitively bid the contractors for the engineering, design and construction components of the program and ultimately selected the most cost competitive bidder based on multiple evaluation factors, with cost serving as the highest weighted criterion. In general, SDG&E conducted competitive bidding for agreements on an approximate three to four year cycle. These agreements were awarded to qualified contractors based on a range of performance metrics, including fee structures, labor rates, staff experience, and safety records.

Trans Fiber Link:
Fiber projects were determined by internal stakeholders needs to support various new and existing communications systems growth and reliability. The fiber links were mapped and built as required for deployment of Electric System Protection, Automation and Controls of Transmission and Distribution circuits. Secure fiber optic communications network is required for transporting large amount of data at high speed for Falling Conductor technology, Condition Based Maintenance (CBM), Wide Area Measurement and Control (Synchro-phasor/Phasor Measurement), Op/Ex 20/20, Video Security and Surveillance, Weather stations, Smart Grid as well as a company owned communications network.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

DCRI: The program completed 12 base stations in 2023. Planned Capital spend was $81,274,000, planned O&M spend was $1,122,000. Due to delays in engineering and permitting, only 12 base stations were completed for the year, bringing the actuals to $8 M. The final payment made towards the Spectrum was allocated previously and accrued until final FCC approval was obtained.

Trans Fiber Link: Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.1.2.8.1. This program does not have specified targets.

Risk Identification and Mitigation:

DCRI: The advantage of the DCRI program is that activation and usage of the spectrum obtained is immediate. Once antennae are installed, usage of the wireless communication is achieved. This provides for secure, reliable visibility into the HFTD/WUI areas of our territory. The program identified areas of the HFTD and WUI that had no communication capabilities and addressing those areas first. The risk is in the ability to expand throughout the HFTD is an expedient manner as the funding aspects of the program have been greatly reduced. An additional risk is that in some areas of our HFTD/WUI, there is no means for reliable communication which will continue to present problems during emergency and PSPS events for our fire-risk monitoring and field/emergency crew communications.
The DCRI program has effectively mitigated the risk of non communication and monitoring during outage and PSPS events. In 2022, an area of the territory lost power for nearly 12 hours. During this time, traditional communication protocols (public cellular and satellite) were down and visibility and monitoring into our grid and fire risk reduction technology would have been down, had they been on these traditional methods. However, due the DCRI network availability in this area, the team never lost the ability to see and monitor the activity in this area. During the almost 12 hour time period, the DCRI network was the only available communication network in the area, allowing monitoring, fire risk visibility and remote capabilities.

Trans Fiber Link: Fiber build projects encounter permitting challenges form many agencies due to the size and region.

Consideration of Alternative Solutions:

DCRI: Several alternatives were analyzed in assessing the DCRI project. These alternatives all had draw backs to reliable, effective and rapid communications for monitoring in our high fire risk prone portions of our territory. Among the alternatives considered were:
-Enablement of devices through public cell carriers (did not allow for communications in area where no cellular service is provided, was more costly in on-going O&M, compromised or no communications during emergency events).
-Satellite communications (while providing communication to areas with no cellular service, this was the most costly in terms of on-going O&M and compromised/congested communications during emergency events).
-Fiber communications throughout (would provide communication to areas with no-cellular service and have a lower on-going O&M cost, however the up-front cost of installation, environmental impact in the HFTD and WUI, along with maintenance issues became much more expensive).
Technical rationale:
Continue building proprietary, single-purpose networks (Tropos, 4RF, Injenu, etc.)
802.16e / WiMAX: Lost momentum, ecosystem dwindling (802.16s/Wi-SUN does address all use cases)
Public Carrier LTE: Significant coverage gaps, No QoS / Guarantees (even with FirstNet)
5G: Focus on density – high bandwidth over short range, currently unproven for IIoT
Wi-Fi6 / 802.11ax: PHY and MAC not design for FAN/WAN, primarily Lic. Exempt focus

Trans Fiber Link:
Alternative Considered:
Continue relying on the existing communications systems, including under-performing Telephone Company lease lines and legacy Power Line Carrier infrastructure, for protection and control functions. Utilize wireless Microwave and LTE technologies only in locations where they are already deployed, without expanding to provide full system coverage or redundancy.

Rationale and Implications:
Under this approach, the transmission and distribution system would continue to face increased exposure to operational risks. Limited and outdated communications capabilities could result in more frequent or extended line outages, and potentially contribute to widespread system or SCADA interruptions. The restricted bandwidth and functionality of these legacy systems would also limit the use of modern microprocessor-based Protection Relays (Intelligent Electronic Devices, or IEDs) for advanced protection, monitoring, and control. In addition, because remote access to IED data would remain constrained, field personnel would need to be dispatched to substations to manually retrieve event data and perform necessary analysis, settings adjustments, and monitoring activities.

Coordination with Similar Programs

N/A

Stakeholder Impact and Engagement:

DCRI: Throughout the permitting process, internal permitting teams work with the County/City where the base station is to obtain the proper permits. Along with public relations working with the community that may be impacted by the base station build to socialize the build and obtain community feedback before each base station is built-out.

TransFiberLink: Fiber project opportunities are reviewed by the stakeholders of all affected business units to determine priorities based on business case approvals for network driving projects that reply on a fiber infrastructure to implement.

Metrics:

DCRI: System performance data during PSPS events demonstrates that the PLTE network has maintained service availability in conditions where commercial carrier networks experienced service loss. During the PSPS events on December 10, 2024, publicly available outage maps showed multiple commercial carrier outages within the affected areas, while the PLTE system remained operational for the duration of the events. PLTE uptime supported continued remote monitoring and operational visibility when commercial networks were unavailable. (See photo)

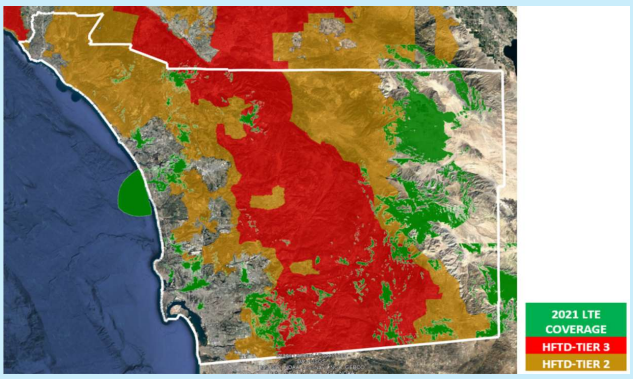
TransFiber Link: N/A

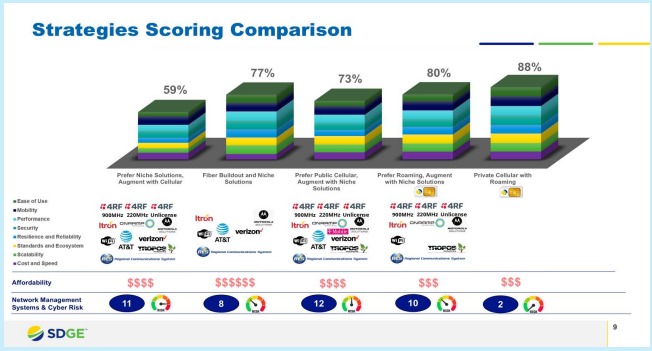
Utility Benchmarking:

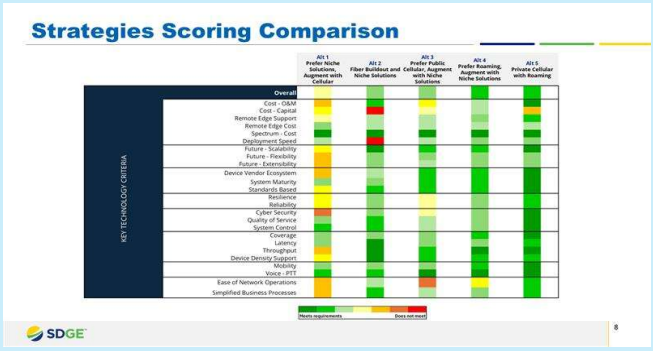
DCRI: Utilities nationally, including PG&E and SCE, have transitioned to or are in the process of transitioning to Private LTE systems, and SDG&E engaged with fourteen utilities of similar or larger scale to evaluate technical practices and implementation approaches. These utilities consistently identified licensed spectrum as necessary to minimize interference, maintain secure and isolated communications, and ensure that operational use cases requiring higher bandwidth and timely data transmission could be supported. Participants also provided information regarding core system design, configuration needs, and lessons learned from base station deployment in varied geographies. The information gathered through this engagement process informed SDG&E's assessment of technical requirements and has continued to guide the development of practices intended to ensure efficient installation costs and reduce ongoing operational expenditures.

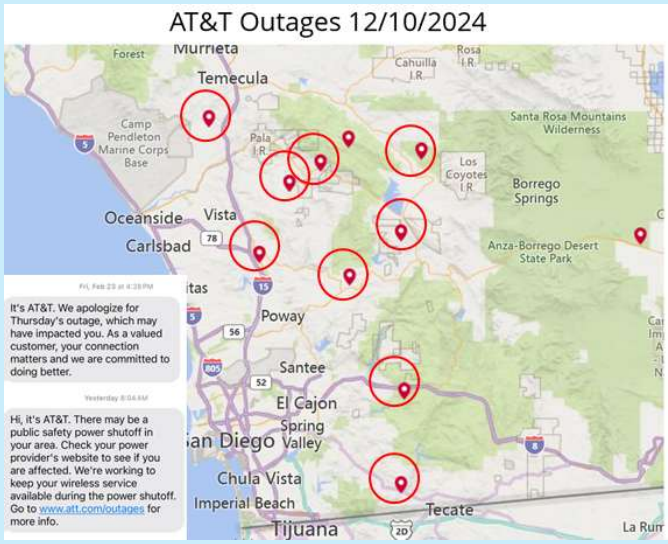
TransFiber Link: N/A

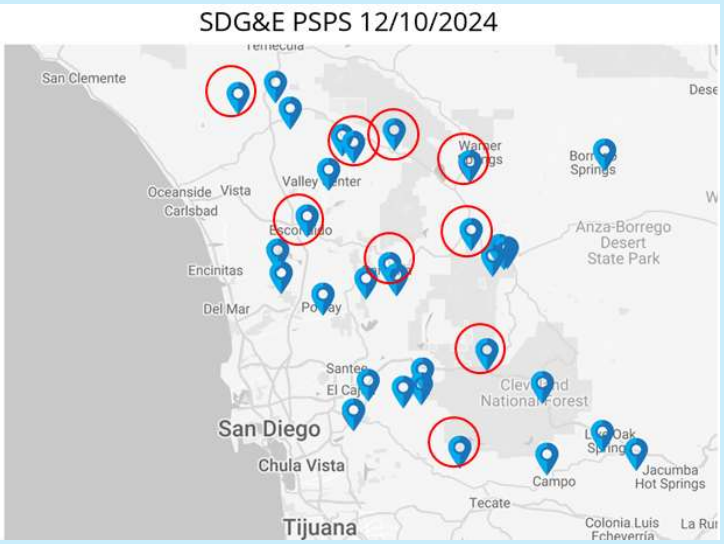
Pictures:











Workpaper	Grid Design, Operations, and Maintenance
Category	Avian Protection Program
WMP Tracking ID	WMP.972

Description	**Avian Protection Program**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	1	27	228	233
Capital Expenditures Non-Labor	-	0	215	1,713	1,252
Capital Expenditures Direct Costs Subtotal	**-**	**1**	**243**	**1,941**	**1,484**
Capital Expenditures Indirect Costs	-	1	170	2,044	1,275
Capital Total	**-**	**2**	**413**	**3,985**	**2,759**
O&M Labor	-	-	-	8	5
O&M Non-Labor	-	-	-	9	5
O&M Direct Costs Subtotal	**-**	**-**	**-**	**17**	**10**
O&M Indirect Costs	-	-	-	(2)	8
O&M Total	**-**	**-**	**-**	**15**	**19**
Units					
Poles*	-	-	-	967	**657**
FTE**	-	0.0	0.2	1.8	**1.8**
Imputed Authorized Direct Capital $					**1,034**
Imputed Authorized Direct O&M $					**-**

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Avian Protection Program					
Capital	**-**	**1**	**243**	**1,941**	**1,484**
Labor	-	1	27	228	233
Non-Labor	-	0	215	1,713	1,252
O&M	**-**	**-**	**-**	**17**	**10**
Labor	-	-	-	8	5
Non-Labor	-	-	-	9	5
Avian Protection Program Total	**-**	**1**	**243**	**1,958**	**1,495**

Business Purpose:

The Avian Protection Program (WMP. 972) involved identifying and retrofitting, rearranging, or building-to-standard distribution poles in SDG&E's service territory within the High Fire Threat District (HFTD) to prevent electrocution of birds and to facilitate compliance with the following Federal and State Laws: Migratory Bird Treaty Act (16 USC §§ 703-712), Bald and Golden Eagle Protection Act (16 USC §§ 668-668d), and the California Fish and Game Code (Cal Fish and Game Code §§ 3503, 3503.5, 3511, 3513). The program also hardened the system and reduced fire risk associated with avian electrocutions, improved SDG&E reliability and customer service, and aligned with Avian Power Line Interaction Committee Guidelines. The plan primarily addressed bird contacts which could lead to an ignition in the HFTD.

Project Justification:

The project was needed to reduce the potential for avian electrocutions on SDG&E's overhead distribution system and maintain compliance with Federal and State wildlife protection requirements. Laws such as the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the California Fish and Game Code impose strict liability for avian take, creating a need for proactive mitigation to avoid violations, penalties, or enforcement actions. In addition, animal contacts represent a total of 7.8 percent of overall risk events in the HFTD between 2017 and 2021. As such, reducing the number of animal contacts by installing avian protection reduces the likelihood of ignitions from occurring. The estimated percent reduction in wildfire ignitions due to the installation of avian covers is 90 percent based on subject matter expertise. This is based on field observations in the Tier 3 area.

Project Scope:

The Avian Protection Program retrofitted or rearranged distribution poles in SDG&E's service territory within the High Fire Threat District (HFTD) to conform with current overhead construction standards. Deliverables within the scope of the program included installation of wider crossarms and conductor spacing to increase phase to ground and phase to phase physical spacing, reducing the potential of physical contact. Insulated covers were also installed on each phase where conductors are attached to a crossarm to prevent physical contact if a bird should land on the top of a pole, and on other devices as needed to provide protection. A work unit is defined as a distribution pole or location where all avian protection improvements are installed.

Cost Drivers:

The charges associated with this specific Avian Protection program outlined in the WMP selected structures within the HFTD where avian protection improvements would provide value in addition to ongoing identification of poles with documented bird contact events. Costs were influenced by field-identified pole configurations that required retrofits, the materials and labor needed to install avian-safe equipment, and the work necessary to rebuild pole tops to meet Avian Power Line Interaction Committee (APLIC) spacing guidelines.

Project Timing and Phases:

Typical project timeline duration from initial scoping to project closeout was approximately 12 months and was completed in one contiguous phase. Milestones included project scoping, work order and budget creation, design review gates, permit coordination, issue for construction (IFC) packages, GIS mapping, material procurement, construction, post construction QA/QC inspection, as-built drawing documentation, and work order close-out. Major dependencies were related to coordination of permits, construction crew scheduling, and weather or holiday related event schedule delays.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program completed over 600 HFTD poles out of the 200 poles identified in SDG&E's approved 2023-2025 WMP. Planned Capital spend was $2,507,000, planned O&M spend was $19,000.

Risk Identification and Mitigation:

Risk identification for SDG&E's Avian Protection Program began with a focused assessment of circuit and structure level conditions that influence both ignition likelihood and service reliability. This assessment considered historical bird contact events and outage drivers, species activity and nesting patterns, proximity to known flyways or habitats, conductor configuration and clearances, device placement (e.g., transformers, switches, reclosers), equipment age and condition, and exposure to elevated fire weather hazards within the HFTD. The risks identified and mitigated by the program included, but were not limited to: (1) non compliance with State and Federal regulations such as the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the California Fish and Game Code, which could result in fines and other penalties; (2) potential service outages due to bird contacts, impacting reliability and customer satisfaction; and (3) wildfire risk due to ignition from bird contacts where avian protection is not installed. This evaluation prioritizes assets with the highest operational and environmental risk profiles for avian protection upgrades.

The program's mitigation strategy included installing avian safe hardware and protective covers (e.g., conductor and bushing covers, insulation for jumpers and leads), perch management devices, line marking or diverters where appropriate, and configuration adjustments to increase clearances and reduce contact potential. Engineering reviews, field validations, and constructability checks were used to determine the most effective protection measures for each location, with implementation guided by standardized installation practices and quality assurance reviews. SDG&E supplemented this work with analytics that integrated inspection data, outage and event histories, species observations, and system planning information to target locations where avian protection measures would yield the greatest risk reduction and reliability benefit.

SDG&E's Avian Protection Program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi Attribute Value Function (MAVF) methodology, to quantify how the program reduced wildfire, reliability, safety, and compliance risks. Using MAVF, the program evaluated safety, reliability, financial impacts, ignition risk reduction, and regulatory compliance considerations to develop a normalized risk reduction score for each targeted segment or asset class. This score was then compared against program costs to produce a unitless RSE value that reflects the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics that demonstrate how the Avian Protection Program contributed to measurable wildfire risk reduction, improved reliability, and regulatory compliance. Note that for methodological consistency and accuracy, units located outside the High Fire Threat District (HFTD)—but in close proximity to HFTD boundaries or within the Wildland Urban Interface (WUI)—were excluded from RSE calculations in this filing. For these locations, cross-boundary exposure and contextual factors can introduce modeling complexities that are not fully accommodated by the current RSE workbooks, making risk-reduction estimates less reliable. Accordingly, the table below reports RSE results only for units located within Tier 2 and Tier 3 HFTD areas, where the existing methodology most accurately reflects risk and benefits.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	171	0.003	4.86	0.05%	364.31
Tier 2	434	0.005	4.77	0.09%	140.74
Non - HFTD / WUI	52	---	---	---	---

Consideration of Alternative Solutions:

Alternative solutions were considered and determined to either be infeasible due to cost or lack of avian protection.
1) Undergrounding of aerial conductors is an option but was determined to be too cost prohibitive when avian protection is considered as the primary scope and only one pole impacted.
2) Performing no mitigation is infeasible as it would not satisfy regulatory compliance with the Migratory Bird Treaty Act (16 USC §§ 703-712), Bald and Golden Eagle Protection Act (16 USC §§ 668-668d), and the California Fish and Game Code (Cal Fish and Game Code §§ 3503, 3503.5, 3511, 3513).

Coordination with Similar Programs

Avian protection equipment (WMP.972) was installed concurrently with other asset replacement initiatives across the HFTD such as hot line clamp replacements (WMP.464), Expulsion fuse replacements (WMP.459), and lightning arrester removal and replacements (WMP.550). This streamlined construction work through the use of a single crew mobilization rather than revisiting the same structure for different projects.

Stakeholder Impact and Engagement:

SDG&E coordinated with external Federal and State regulatory agencies to ensure compliance with the Migratory Bird Treaty Act (16 USC §§ 703-712), Bald and Golden Eagle Protection Act (16 USC §§ 668-668d), and the California Fish and Game Code (Cal Fish and Game Code §§ 3503, 3503.5, 3511, 3513). SDG&E also communicated with the public and our customers via our wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted mailers and/or door tags to provide additional information to specific customers if they were affected by fielding or construction activities.

Metrics:

SDG&E set a goal of 200 Avian Protection projects in 2023 and completed a total of 657.

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Strategic Pole Replacement Program
WMP Tracking ID	WMP.1189

Description	**Strategic Pole Replacement Program**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	26
Capital Expenditures Non-Labor	-	-	-	-	33
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**59**
Capital Expenditures Indirect Costs	-	-	-	-	41
Capital Total	**-**	**-**	**-**	**-**	**100**
O&M Labor	-	-	-	-	0
O&M Non-Labor	-	-	-	-	0
O&M Direct Costs Subtotal	**-**	**-**	**-**	**-**	**0**
O&M Indirect Costs	-	-	-	-	0
O&M Total	**-**	**-**	**-**	**-**	**0**
Units					
Pole	-	-	-	-	1
FTE*	-	-	-	-	**0.0**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Strategic Pole Replacement Program (SPRP) - WMP					
Capital	**-**	**-**	**-**	**-**	**59**
Labor	-	-	-	-	26
Non-Labor	-	-	-	-	33
O&M	**-**	**-**	**-**	**-**	**0**
Labor	-	-	-	-	0
Non-Labor	-	-	-	-	0
SPRP - WMP Total	**-**	**-**	**-**	**-**	**60**

Business Purpose:

The Strategic Pole Replacement Program (SPRP) was a wildfire-mitigation initiative aligned to Public Utilities Code §8386 and General Orders 95 and 165. The business purpose of SPRP is to reduce the risk of utility-caused wildfires by identifying and replacing distribution poles that present an elevated ignition and structural failure risk—primarily aging gas-treated (Cellon or similar) wood poles that may also be reinforced with C-Truss and/or poles set in concrete that exhibit material degradation.

SPRP targets poles in CPUC-designated High Fire-Threat Districts (HFTD) Tiers 2 and 3 and in Wildland-Urban Interface (WUI) areas and focuses specifically on assets that are not otherwise mitigated by other grid-hardening initiatives such as Covered Conductor or Strategic Undergrounding.

Objectives:
- Eliminate discrete ignition drivers associated with deteriorated/treated wood poles under high wind, heat, and low-humidity conditions.
- Improve structural reliability and code conformance of the distribution system by replacing high-risk poles rather than deferring to temporary reinforcements.
- Avoid redundant investment by coordinating scope so SPRP addresses only poles not already planned under other WMP programs.
- Deliver measurable risk reduction, supported by documented engineering assessments.

Project Justification:

Certain distribution poles present elevated wildfire ignition risk due to age, material condition, and/or installation characteristics. These include aging gas-treated (Cellon) wood poles that are reinforced with C-Truss. SPRP is a risk-based mitigation program designed to address these identified risk drivers through targeted replacement of Cellon-treated and C-Truss-reinforced poles, supported by detailed engineering analysis, field scoping, and environmental review, consistent with SDG&E's wildfire risk assessment methodologies described in the Wildfire Mitigation Plan (WMP). The Strategic Pole Replacement Program was based on documented research, inspections and engineering analysis indicating that aging gas-treated (Cellon or similar) wood poles, particularly those installed in concrete foundations and reinforced with steel truss (C-truss) systems, present an elevated risk of deterioration due to moisture interaction and age, increasing the likelihood of pole failure and associated safety, reliability, and wildfire ignition impacts. The program addressed a defined population of high-risk poles that were not otherwise scheduled for replacement under existing system hardening initiatives and would remain in service absent targeted intervention by proactively replacing these assets in a manner consistent with SDG&E's wildfire risk assessment methodologies and risk reduction objectives.

Project Scope:

The Strategic Pole Replacement Program was a pole replacement initiative. Scope is limited to the targeted replacement of aging gas-treated (Cellon or similar) wood distribution poles, including those reinforced with C-Truss, that have been identified through SDG&E's wildfire risk assessment process as presenting elevated risk and were not otherwise planned for replacement under existing system hardening programs. The pole was prioritized based on treatment type, age, structural configuration, and location, with emphasis on assets located within High Fire Threat District Tier 2, Tier 3, and WUI areas, and the work unit is defined as individual poles to ensure focused, measurable, and cost-effective risk mitigation consistent with the scope authorized in the General Rate Case and Wildfire Mitigation Plan filings. Any limited adjustments to the specific poles addressed occur only as part of detailed engineering review and field verification necessary to safely and effectively execute the approved scope and do not represent an expansion of the program's authorized objectives or overall scope. Certain distribution poles present elevated wildfire ignition risk due to age, material condition, and installation characteristics. The program defined the work unit as individual poles to enable discrete scoping, execution, tracking, and reporting of work in alignment with approved budgets and regulatory oversight requirements.

Cost Drivers:

The costs incurred in 2023 included cost associated with the replacement of a single gas treated pole within the WUI, which included labor, equipment, and material. Materials included a galvanized steel pole, fiberglass cross-arms, polymer insulators, hardware, grounding, and consumables. Cellon-treated removal/disposal and specialized transport added cost. The project also required traffic control.

Project Timing and Phases:

Delivery Model:
SPRP executes in phased waves to ensure constructability and seasonal readiness. A typical project runs 8–12 months from initial scoping to close-out, with overlapping waves to maintain throughput.

Phases and Milestones:
1) Identification & Prioritization (Month 0–1): Apply risk model to inspection data; confirm exclusions with Covered Conductor/Undergrounding.
2) Field Scoping (Month 1–3): Site walkdowns, access constraints, preliminary traffic control, environmental screenings, initial outage needs.
3) Engineering & IFC (Month 2–5): Pole-loading/calcs, standards conformance, detailed design, GIS updates, IFC package issuance.
4) Procurement (Month 3–6): Long-lead material orders, contractor work packages, traffic control scheduling, environmental pre-clearances.
5) Construction (Month 5–10): Crew mobilization, pole setting, transfers, retirements, site restoration; Quality Assurance / Quality Control (QA/QC) during construction.
6) Post-Construction QA/QC & Close-Out (Month 9–12): As-builts, inspections, environmental closeout, financial settlement, asset registry updates.

Critical Path/Dependencies:
• Permit lead times (encroachment, environmental, railroad/state/county roads).
• Outage windows and wildfire-season restrictions.
• Long-lead materials (select pole sizes/species, specialty hardware).
• Contractor availability and traffic control resources.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis. Program costs were tracked through an established budget and reported through required quarterly and annual filings, consistent with SDG&E's standard capital budget governance and controls.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program had a target of 60 poles in 2023 and completed 1 pole. There were approximately six other projects issued in 2023 but none of them were completed by the end of the year due to the program ramp up and significant delays in permitting. Planned Capital spend was $1,710,000, planned O&M spend was $130,000.

In total 6 poles were issued to construction in 2023, all of which were issued in either late November or December, which did not provide enough time to work with construction resources, receive final materials, schedule outages, and complete construction. Poles not completed in 2023 were scheduled to be completed in future years.

Risk Identification and Mitigation:

Risk identification for SPRP was based on SDG&E's wildfire risk assessment methodologies, which prioritize gas-treated (Cellon) poles reinforced with C-Truss and installed in concrete that present elevated potential for structural failure and ignition. Risk mitigation was achieved through targeted pole replacement and through the phased execution approach.

Key Risks and Mitigations:
• Wildfire ignition/asset failure: Addressed by risk-based selection of poles (aging gas-treated, C-Truss reinforced, set in concrete) and full replacement to current standards; QA/QC verifies installation quality.
• Schedule risk (permits/outages/weather): Mitigated through phased packaging, early permit submittals, pre-negotiated traffic control, and flexible outage planning; build windows prioritized before peak fire season.
• Cost risk (inflation/change orders): Managed by Master Service Agreements (MSAs) with indexed unit rates, early material buys, scope standardization, and change-control governance.
• Resource risk (contractor/crew availability): Mitigated by maintaining a qualified internal crew and contractor bench, staggered start dates, and geographic bundling to optimize crew utilization.
• Environmental/land access risk: Early biological/cultural reviews, seasonal timing, and landowner engagement secure access while complying with permit conditions.
• Data/traceability risk: All work units tied to unique asset IDs, inspection records, and completion documentation to support auditability and avoid double counting with other programs.

Cost-Effectiveness:
• Packaging and standardization lower soft-cost share and reduce rework, improving unit cost reasonableness over time. Through visiting the sites, allowed for increased surveillance and helped address issues sooner.

The following table summarizes key program metrics demonstrating how the Strategic Pole Replacement Program contributed to measurable risk reduction. However, the only unit completed by this program in 2023 was outside of the HFTD in the WUI and for consistency and accuracy, units located outside the HFTD—but in close proximity to HFTD boundaries or within the WUI—were excluded from RSE calculations in this filing. For these locations, cross-boundary exposure and contextual factors can introduce modeling complexities that are not fully accommodated by the current RSE workbooks, making risk-reduction estimates less reliable. Accordingly, the table below reports RSE results only for units located within Tier 2 and Tier 3 HFTD areas, where the existing methodology most accurately reflects risk and benefits.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	0	0	0	0.00%	0.00
Tier 2	0	0	0	0.00%	0.00
Non - HFTD / WUI	1	---	---	---	---

Consideration of Alternative Solutions:

Alternatives Evaluated:
1) Do Nothing: Not acceptable, as it retains elevated ignition and structural failure risk, potentially increases PSPS frequency and duration, and does not meet WMP objectives.
2) Corrective Maintenance Only (repair/C-Truss Reinforcement): Temporarily reduces risk but leaves underlying deterioration; repeated inspection/maintenance increases lifecycle cost and operational burden.
3) Other grid-hardening strategies: Other options such as installing covered conductors or implementing strategic undergrounding, that provide superior wildfire mitigation benefits but also involve significantly longer lead times due to their design, permitting, and construction requirements. This alternative also increase scope of impacted, which will increase scope.
4) Non-wood or composite pole conversions: May be appropriate for site-specifical locations; increases unit cost and may introduce design/grounding complexities. Used selectively based on engineering judgment.

Rationale for Selected Approach:
SPRP's targeted wood-pole replacement most efficiently eliminated the identified failure and ignition drivers for the defined population of poles, achieved compliance with current standards, and avoided redundancy with other programs. It balanced risk reduction, cost, and schedule feasibility.

Coordination with Similar Programs

The pole replacement in 2023 for the SPRP was coordinated with other wildfire mitigation and asset management programs, including Covered Conductor, Strategic Undergrounding, and the Corrective Maintenance Program. Coordination occurred during pole identification, scoping, and planning stages to ensure the pole addressed under SPRP were not concurrently planned for replacement or mitigation under another program. This coordination supports efficient execution and avoids redundant investment.

Coordination Practices:
• Program boundary rules exclude any pole already scheduled within Covered Conductor, Strategic Undergrounding, or corrective maintenance that fully mitigates the risk.
• Cross-program reviews: Monthly coordination with program leads; GIS overlays reconcile candidate lists via an overlap detection report.
• Sequencing: Where corridor work is planned (e.g., Covered Conductor), SPRP defers or aligns replacement to avoid rework while ensuring no high-risk pole remains unaddressed prior to the construction season.

Stakeholder Impact and Engagement:

For the pole replaced in 2023, a traffic control permit was required with the City of San Clemente. However, in general the SPRP requires coordination with regulatory agencies, landowners, and other stakeholders as part of land rights, environmental review, and permitting activities. Stakeholder engagement is sequenced consistent with the program's stages of project execution and is conducted in advance of construction to support safe access, proper land rights, compliance with environmental requirements, and efficient construction execution.

Impacted Stakeholders:
• Regulatory and permitting agencies (state, county, city), transportation agencies (e.g., Caltrans and local DPWs), utility districts, and fire authorities.
• Landowners and right-of-way holders, HOAs, tribal governments, and public land managers.
• Communities and customers affected by traffic control, construction activity, and planned outages.

Engagement Approach:
• Early outreach to landowners and agencies during scoping to confirm access requirements and sensitive-season constraints.
• Permit sequencing aligned to program waves to secure approvals prior to mobilization; pre-construction meetings with inspectors/monitors.
• Customer communications for any planned outages or traffic impacts, coordinated with local jurisdictions and fire agencies.
• On-site environmental and cultural monitors when required; restoration commitments documented and closed.
• Feedback loop: Post-construction review of complaints, incidents, or restoration issues to refine future packages.

Metrics:

N/A

Utility Benchmarking:

Industry Context:
Peer Investor Owned Utilities in California and the West have implemented targeted programs to address aging or high-risk wood poles as part of wildfire mitigation portfolios. Common themes include risk-based selection (age/treatment/type/condition), structural loading to current standards, and tight coordination with covered conductor and undergrounding programs to avoid redundant investment. For example, a directive was issued to PG&E with corrective actions that the utility must take regarding an incident with a Cellon-treated pole that occurred in Danville, Calif. in 2020 (https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-staff-propose-penalizing-pge-for-failure-to-promptly-remediate-safety-issue). Utilities report that initial years emphasize program setup, sourcing, and design standardization, followed by scale-up in construction volume and declining soft-cost percentage.

Lessons Learned Incorporated:
• Standardization: Use repeatable design details and IFC templates to compress engineering cycles and reduce change orders.
• Early, bulk procurement: Pre-buy standard pole classes and hardware; hold contingency stock for peak season to avoid schedule slips.
• Contractor panel with performance metrics: Maintain a qualified bench; cluster work geographically to reduce travel and traffic-control costs.
• Data governance: Tie every pole to a unique asset ID with traceable inspection evidence, design calculations, and close-out records to support auditability and avoid double counting across programs.
• Environmental/permit readiness: Stage biological/cultural reviews and traffic control early; align windows to seasonal constraints to protect schedule.
• Packaged execution: Bundle poles into constructible packages that share access, outages, and traffic plans to drive economies of scale.
• Post-construction QA/QC and as-built discipline: Close the loop quickly to ensure assets are accurately reflected in enterprise systems and to capture unit-cost and productivity learning for the next wave.

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Wireless Fault Indicators
WMP Tracking ID	WMP.449

Description	**Wireless Fault Indicators**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	39	34	50	84	9
Capital Expenditures Non-Labor	755	829	1,081	798	1
Capital Expenditures Direct Costs Subtotal	**794**	**863**	**1,131**	**883**	**11**
Capital Expenditures Indirect Costs	400	608	652	856	14
Capital Total	**1,194**	**1,471**	**1,784**	**1,738**	**24**
O&M Labor	-	-	-	-	-
O&M Non-Labor	-	-	-	-	-
O&M Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
O&M Indirect Costs	-	-	-	-	-
O&M Total	**-**	**-**	**-**	**-**	**-**
Units					
Wireless Fault Indicators*	594	502	544	595	9
FTE**	0.5	0.4	0.6	1.0	**0.0**
Imputed Authorized Direct Capital $					1,877
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Wireless Fault Indicators					
Capital	**794**	**863**	**1,131**	**883**	**11**
Labor	39	34	50	84	9
Non-Labor	755	829	1,081	798	1
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Wireless Fault Indicators Total	**794**	**863**	**1,131**	**883**	**11**

Business Purpose:

Wireless Fault Indicators (WFI) were used to monitor distribution lines and locate faults more efficiently and accurately using Low Power Communication Network (LPCN) communication to alert distribution system operators when and where a fault on any circuit segment occurs. WFIs can detect faults without having a minimum continuous current on the line, and therefore can be installed in remote locations that have very little load. Distribution system operators can dispatch electric troubleshooters close to the exact fault location to identify and isolate the fault to begin service restoration quickly. In addition, if the devices are not communicating back to the network, they also provide a visual indication in the field for the electric troubleshooters to trace to the specific segment in a more timely manner than without this piece of equipment.

Project Justification:

The WFI Program reduces the risk of wildfires by providing awareness of the location of faults that have occurred on distribution lines, and improving electric safety and reliability during typical and extreme weather conditions. WFIs also promote a timely response to faulted circuit segments, thus reducing the consequence of an ignition if one were to occur.

Project Scope:

The WFI program installed fault indication devices on distribution conductors in SDG&E's service territory within the High Fire Threat District (HFTD). Deliverables within the scope of the program included installation of fault indication devices on each phase conductor at a specific location on the circuit. A work unit was defined as a set of devices (2 or 3 depending on the number of phase conductors present) at a specific longitude/latitude location on the circuit. Multiple work units may be installed on a circuit to increase sectionalization diagnostic capabilities.

Cost Drivers:

A majority of costs for this program were associated with vendor procured material as well as internal union labor to install devices on a targeted circuit. Capital underspend was due to deploying fewer units than anticipated in 2023 due to an upgrade to vendor equipment, which made it incompatible with SDG&E's communications network. For that reason, SDG&E paused the program to evaluate alternative equipment for future use. 9 units which were planned for install in 2022 were ultimately completed in 2023.

Project Timing and Phases:

Typical project timeline duration from initial scoping to project closeout was approximately 6 months and was completed in one contiguous phase. Milestones included project scoping, work order and budget creation, design sketch reviews, permit coordination, issue for construction (IFC) packages, GIS mapping, material procurement, construction, post construction quality assurance and/or quality control inspection, and work order close-out. Major dependencies were related to coordination of permits, construction crew scheduling, and weather or holiday related event schedule delays.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.3.3.1. This program did not have specified target for 2023. Planned Capital spend was $51,000.

Risk Identification and Mitigation:

The risk identified and mitigated by the WFI included, but was not limited to increased time to isolate faults due to decreased situational awareness.

SDG&E's Wireless Fault Indicator program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi Attribute Value Function (MAVF) methodology, to quantify how the program reduced wildfire, reliability, safety, and compliance risks. Using MAVF, the program evaluated safety, reliability, financial impacts, ignition risk reduction, and regulatory compliance considerations to develop a normalized risk reduction score for each targeted segment or asset class. This score was then compared against program costs to produce a unitless RSE value that reflects the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics that demonstrate how the Wireless Fault Indicator program contributed to measurable wildfire risk reduction, improved reliability, and regulatory compliance. Note that for methodological consistency and accuracy, units located outside the High Fire Threat District (HFTD)—but in close proximity to HFTD boundaries or within the Wildland Urban Interface (WUI)—were excluded from RSE calculations in this filing. For these locations, cross boundary exposure and contextual factors can introduce modeling complexities that are not fully accommodated by the current RSE workbooks, making risk reduction estimates less reliable. Accordingly, the table below reports RSE results only for units located within Tier 2 and Tier 3 HFTD areas, where the existing methodology most accurately reflects risk and benefits.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	0	0	0	0.00%	0.00
Tier 2	0	0	0	0.00%	0.00
Non - HFTD / WUI	9	---	---	---	---

Consideration of Alternative Solutions:

Do not install WFIs – Installation of WFIs would allow for quicker and more accurate fault identification which improves the safety and response time. Within the HFTD, continuing with existing operation without the use of WFIs provided risk with these potential delays in response to the actual fault cause. At the time of this program, the equipment procured was compatible to SDG&E's network and provided different insights than alternative solutions.

Coordination with Similar Programs

The WFI Program coordinated with and is compatible with other grid hardening programs, including but not limited to: Advanced Protection Program, Early Fault Detection Program, Cover Conductor Program, PSPS Sectionalizing Enhancements, and other similar programs. The program coordinated with the other protection programs to avoid duplicative technology on the same segments of circuits, while the program coordinated with the other construction and sectionalizing programs to strategically install equipment during those projects in order to avoid duplicative field visits and designs.

Stakeholder Impact and Engagement:

SDG&E communicated with the public and our customers via our wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted mailers and/or door tags to provide additional information to specific customers if they will be affected by fielding or construction activities associated with this program.

Metrics:

Due to challenges with our WFI vendor updating their devices, making them incompatible with our system, SDG&E only installed nine sensors in 2023. The units that were installed were ones that had already been provided prior to the vendor update.

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	PSPS Sectionalizing Enhancement Program
WMP Tracking ID	WMP.461

Description	**PSPS Sectionalizing Enhancement Program - Engineering Enhancements**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	109	432	157	177	136
Capital Expenditures Non-Labor	1,239	4,742	1,927	2,173	1,806
Capital Expenditures Direct Costs Subtotal	**1,348**	**5,174**	**2,083**	**2,350**	**1,943**
Capital Expenditures Indirect Costs	1,015	3,620	1,701	1,867	1,593
Capital Total	**2,363**	**8,794**	**3,784**	**4,217**	**3,536**
O&M Labor	-	-	-	-	-
O&M Non-Labor	-	-	-	-	-
O&M Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
O&M Indirect Costs	-	-	-	-	-
O&M Total	**-**	**-**	**-**	**-**	**-**
Units					
Switches*	7	23	13	12	**13**
FTE**	0.9	3.4	1.2	1.3	**0.9**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
PSPS Engineering Enhancements					
Capital	**1,348**	**5,174**	**2,083**	**2,350**	**1,943**
Labor	109	432	157	177	136
Non-Labor	1,239	4,742	1,927	2,173	1,806
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
PSPS Engineering Enhancements Total	**1,348**	**5,174**	**2,083**	**2,350**	**1,943**

Business Purpose:

The Public Safety Power Shutoff (PSPS) Sectionalizing Enhancement Program installed switches in strategic locations, enabling the isolation of higher-risk areas for potential de-energization. For example, switches were installed on circuits that have significant sections underground upstream of the switch, allowing customers served with this lower-risk infrastructure to remain energized during PSPS events. These sectionalizing devices were associated with weather stations and provided real-time weather data at a more granular circuit-segment level, which allows for more precise de-energization decisions.

Project Justification:

The purpose of the PSPS Sectionalizing Enhancement Program was to reduce the customer impact of PSPS events, consistent with California Public Utilities Code Section 8386(d)(6). By increasing the number of remotely operated sectionalizing devices and strategically located them within higher risk circuits, SDG&E reduces the number of customers that have the potential to be impacted by a PSPS event or potentially reduce the duration of de-energization based on local wind events.

Project Scope:

The PSPS Sectionalizing Enhancement Program retrofitted or installed new supervisor control and data acquisition (SCADA) enabled switches or reclosers in SDG&E's service territory within the High Fire Threat District (HFTD), conforming with current SDG&E construction standards. Deliverables within the scope of the program included installation of wider crossarms and conductor spacing to increase phase to ground and phase to phase physical spacing, installation of new SCADA enabled switches or reclosers, replacement of the existing distribution pole at the targeted location if pole loading calculations indicate the pole could not support the increased load, and installation of radio telemetry equipment for communicating SCADA.

Cost Drivers:

Key components driving a majority of costs in this program included vendor procured materials (reclosers and associated equipment), contract services (engineering, design and construction), warehouse material issuances (distribution poles), and labor (construction and management). In 2023, costs were incurred to install switches on high-risk circuits. The expenses align with the work performed, ensuring enhanced safety and reliability. Overall investment was justified by the intent to reduce scale, scope, and frequency of PSPS events.

Project Timing and Phases:

Typical project timeline duration from initial scoping to project closeout was approximately 12 to 18 months and was completed in one contiguous phase. Milestones included project scoping, work order and budget creation, design review gates, permit coordination, issue for construction (IFC) packages, geographic information system mapping, material procurement, construction, post construction quality control and/or quality assurance inspection, as-built drawing documentation, and work order close-out. Major dependencies were related to coordination of permits, construction crew scheduling, and weather or holiday related event schedule delays.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program met and exceeded its approved annual targets by installing 13 switches in 2023. The costs shown in the tables above reflect the full scope of activities required to deliver the installation of the avian protection equipment on distribution poles. These costs are consistent with the program's authorized work plan and represent the resources needed to complete the approved units of work while maintaining compliance with all applicable regulatory and safety requirements.

Risk Identification and Mitigation:

Risks identified and mitigated by the PSPS Sectionalizing Enhancement Program include, but were not limited to:

1) Increased number of customers affected by PSPS events due to reduced number of sectionalizing devices on a circuit
2) Wildfire risk due to vegetation or other foreign object contact if sectionalizing devices are not installed.
3) Reduced situational awareness due to lack of SCADA enabled telemetry data not installed.

SDG&E's PSPS Sectionalizing Enhancement program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how the program reduces wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each targeted segment or asset class. This score was then compared against program costs to produce a unitless RSE value that reflected the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics demonstrating how the PSPS Sectionalizing Enhancement program contributes to measurable PSPS risk reduction and reliability improvement. Note that for methodological consistency, units located outside the High Fire Threat District (HFTD)—but in close proximity to HFTD boundaries or within the Wildland Urban Interface (WUI)—were excluded from RSE calculations in this filing. For these locations, cross boundary exposure and contextual factors can introduce modeling complexities that are not fully accommodated by the current RSE workbooks, making risk reduction estimates less reliable. Accordingly, the table below reports RSE results only for units located within Tier 2 and Tier 3 HFTD areas, where the existing methodology most accurately reflects risk and benefits.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	2	0	412.1	15.07%	20,510.36
Tier 2	10	0	404.23	34.48%	4,023.75
Non - HFTD / WUI	1	---	---	---	---

Consideration of Alternative Solutions:

Do nothing, which would have had the following negative consequences:
1. Accept risk of reduced SCADA control if manual sectionizing devices (fuses) are installed.
2. Increased number of customers would be impacted by PSPS events due to reduced sectionalizing equipment.
3. Utilize primary distribution breaker installed at the substation to deenergize the complete circuit if a fault is detected.

Coordination with Similar Programs

PSPS Sectionalizing equipment was compatible with falling conductor protection technology deployed by the Advanced Protection Program with both programs providing direct benefits to each other.

Stakeholder Impact and Engagement:

SDG&E coordinated with external Federal and State regulatory agencies to ensure compliance with environmental and permit requirements. SDG&E also communicated with the public and our customers via our wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted mailers and/or door tags to provide additional information to specific customers if they will be affected by fielding or construction activities.

Metrics:

SDG&E completed 13 total units in 2023.

Utility Benchmarking:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Standby Power Program
WMP Tracking ID	WMP.468

Description	**Standby Power Program**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	-
Capital Expenditures Non-Labor	-	-	-	-	-
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
Capital Expenditures Indirect Costs	-	-	-	-	-
Capital Total	**-**	**-**	**-**	**-**	**-**
O&M Labor	-	47	68	93	137
O&M Non-Labor	-	1,707	8,869	11,959	12,575
O&M Direct Costs Subtotal	**-**	**1,754**	**8,937**	**12,052**	**12,712**
O&M Indirect Costs	-	42	88	138	124
O&M Total	**-**	**1,796**	**9,026**	**12,190**	**12,836**
Units					
Installations*	-	-	355	376	**362**
FTE**	-	0.6	0.8	1.1	**1.5**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Standby Power Program					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**-**	**1,754**	**8,937**	**12,052**	**12,712**
Labor	-	47	68	93	137
Non-Labor	-	1,707	8,869	11,959	12,575
Standby Power Program Total	**-**	**1,754**	**8,937**	**12,052**	**12,712**

Business Purpose:

The Standby Power Program and its three components were part of SDG&E's Wildfire Mitigation Program and targeted customers and communities that will not directly benefit from other grid hardening programs in the near future. The Standby Power Program consists of the Fixed Backup Power (FBP) Program targeting residential customers, FBP Program targeting commercial customers, and the Mobile Home Park Resilience Program (MHRP), which targets mobile home park clubhouses. Customers were provided a backup power solution in the form of generator, solar panel, or backup battery to best support their needs in the event of an extended outage. The objective of the program was to lessen the inconvenience of public safety power outages in the High Fire Threat District (HFTD).

Project Justification:

The Standby Power Program included three components that each targeted customers and communities that will not directly benefit from other grid hardening programs. These customers resided in areas where traditional grid hardening initiatives may not reduce potential Public Safety Power Shutoff (PSPS) exposure. The Standby Power Program consisted of the FBP Program targeting residential customers, FBP Program targeting commercial customers, and the Mobile Home Park Resilience Program targeting mobile home park clubhouses. These targeted customers were located within the HFTD and generally on circuits in communities most prone to PSPS exposure. As provided for under California Public Utilities Code Section 8386 and Commission guidance such as in D.20-05-051, PSPS events can have negative customer impacts and should be limited as much as feasible to the specific areas that are experiencing extreme risk. Because the backup power solutions provided to customers as a part of this program are whole-facility solutions that are expected to keep the customers energized throughout a PSPS event, the effectiveness of the mitigation is estimated to be 100 percent.

Residential Fixed Backup Power - Provided permanent backup generators to residential customers that were not expected to benefit from traditional hardening efforts in the near future. Allowing customers to have power during a safety outage lessened the burden of outages in the community and broadens the understanding for PSPS outages during high wind events.

Commercial Fixed Backup Power - Provided permanent backup generators and/or solar and backup battery to non-residential customers that are not expected to benefit from traditional hardening efforts in the near future. Allowing customers to have power during PSPS outages lessened the burden of outages in the community and broadens the understanding for PSPS during high winds. Commercial sites were selected by identifying locations that with power during a PSPS outage could function as a community hub and support many individuals at any given time. Some of the sites selected act as SDG&E Community Resource Centers during PSPS outages and host community members with a safe place to gather, recharge emergency equipment and provide critical needs for the public. Other sites had been identified by SDGE's Community Outreach team as locations that were historically impacted by outages but with power had the ability to support many community members. Providing Commercial installations allows for the program to have a widespread community impact and provide a central location for critical support.

Mobile Home Park Resiliency Program (MHPR) - Provided permanent backup generators and/or solar and backup battery to building sites that are within mobile home parks located within the HFTD on circuits in communities that are most prone to PSPS exposure. The program focused on central locations such as clubhouse facilities where residents could charge phones or laptops, keep medical devices powered, seek air conditioning, or refrigerate medicine in the community refrigerator. Allowing customers to have power during PSPS outages lessened the burden of outages in the community and broadens the understanding for PSPS during high winds. Targeting centralized locations in mobile home parks allowed installations to benefit a larger number of customers in the community as a shared resource.

Project Scope:

In order to provide fixed standby power solutions for target customers in the HFTD, the program included a number of key tasks and activities to manage each project. Customer projects were identified as eligible based on a number of factors including address location in HFTD, historical PSPS outage data, circuit location, and ability to serve broader community (for Commercial FBP and MHPR). Customers received outreach invitations to the program, which were monitored via system workflows to track participation and movement through project stages. Customer project applications were reviewed and participation agreements were provided and processed for inclusion in the program. For approved customer project agreements, site evaluation, site design and jurisdiction permitting was conducted. Upon approved permit, the project included site installation and equipment procurement. Upon completed installation, the site project engaged in jurisdiction inspection and Investor Owned Utilities (IOU) interconnection processes. Upon completion of these stages, customers were educated on the installed equipment and on maintenance procedures.

SDG&E completed 362 project installations including residential, commercial and mobile home parks. Residential projects provided customers a permanently installed 22 kW propane generator, including professional installation and the necessary administration. Commercial and Mobile Home Park projects provided a customized installation including a blend of fuel generator, solar photovoltaic and battery energy storage, based on the specific site design characteristics.

Cost Drivers:

The key components of costs included:
Program and project administration activities related to contract management, project identification, system processing/tracking, customer outreach and engagement, and additional administrative support.
Project installation costs related to on-site consultation, site design, site permitting, site inspections, interconnection processing, and additional implementation support.
Project equipment costs related to fuel generators, solar photovoltaic equipment, battery energy storage system equipment, and the auxiliary equipment necessary for safe and effective system operations and performance.
Project installation and equipment made up the largest share of these costs.

Project Timing and Phases:

The program ran throughout 2023. A project could move from start to finish in 12 weeks but was typically completed within 16-20 weeks. Once an applicant was approved for the program, the customer would receive an in home consultation from a certified installer to plan for the placement of their permanent generator. At this time, customers would also sign a customer agreement showing intent of pursuing the project to completion. This agreement was reviewed by SDG&E and countersigned which kick started the permitting, construction and installation process at the customer's address. Installation of the generator was scheduled and completed, final work underwent quality inspection, and then received an inspection from the authority having jurisdiction which marked the conclusion of the project.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Project (Customer) Approval: Each customer was pre-qualified for program participation based on a specific set of criteria (HFTD Tier, PSPS history). The program participation process verified customer account information, engaged in customer agreement processes to support compliance with program rules, coordinated with relevant local jurisdiction permitting and inspection processes for system installation approval, and engaged with SDG&E interconnection process for review and approval of any equipment interconnected to the electrical system.

Services Procurement: The program vendor partner was awarded a contract based on directly applicable experience, strong relationships with certified equipment suppliers (fuel generators, solar photovoltaic, battery energy storage systems) as well as locally operated, licensed system installers.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program delivered over 360 generators out of the 300 generators included in SDG&E's approved 2023-2025 WMP annual target. Planned O&M spend was $10,350,000.

Risk Identification and Mitigation:

Risks identified and mitigated by the Standby Power Program include, but were not limited to:

Permitting and inspection delays (operational): Coordinating with jurisdiction staff to schedule and complete permitting and inspections for a high volume of project can cause delays that can impact project timelines. To mitigate, the program began leveraging supporting information including the parcel number to more effectively communicate with the jurisdiction information about the project location. Additionally, the program developed a more comprehensive installation checklist, and engaged with the jurisdiction to schedule project inspections in groups based on geographic location to streamline on-site inspections. These mitigations resulted in decreased permitting approval times, and an increased first-time conversion rate for project inspections.

Customer responsiveness (operational): The program relied on customer responsiveness in order to complete site visits and installations. Challenges maintaining active engagement with each customer can increase per-project timelines. To mitigate this, the program added additional questions to the customer intake form, which provided installation crews more information about customer residences prior and decreased time required during the design phase. The program also revamped automated customer communications throughout the program process to improve customer experience. This provided customers with clearer up-front expectations during each phase of their project and reduced the volume of customer inquiries regarding the status of their project.

SDG&E's Standby Power program applies the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how the program reduces wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluates safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each targeted segment or asset class. This score is then compared against program costs to produce a unitless RSE value that reflects the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics demonstrating how the Standby Power program contributes to measurable PSPS risk reduction and reliability improvement. This program does not directly influence the likelihood or consequence of potential ignitions within SDG&E's service territory. It instead mitigates PSPS impacts.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	262	0	349.7	12.78%	453.75
Tier 2	100	0	126.71	10.81%	430.77
Non - HFTD / WUI	0	---	---	---	---

Consideration of Alternative Solutions:

Alternative solution / comparison: Do nothing, and accept risk of PSPS outages on customer safety, particularly for those who have experienced a high volume of PSPS, and were not included in near-term grid hardening programs.

Coordination with Similar Programs

Outage management to support targeting of customers who have experienced PSPS outages.
Customer Resource Center program to promote coordination with temporary backup power support as needed.
Grid hardening programs to coordinate target locations where hardening efforts are not focused in the near term.
Temporary backup power programs to coordinate across offerings to avoid duplication.

Stakeholder Impact and Engagement:

The program engaged with local jurisdictions to comply with rules and processes involved when installing equipment, including permitting and inspections. For projects that involved community-essential sites (e.g., markets, community centers, mobile home parks), the program engaged with business and community leaders involved with those relevant organizations. SDG&E also communicated with the public and our customers via our wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted communications and marketing campaigns to provide additional information to specific customers if they will be eligible for the program.

Metrics:

Metrics involved in the management of the Standby Power Program include:
Open Project Applications in 2023 (carryover from prior years): 219
New Project Applications in 2023: 276
Total Open Applications in 2023 (includes carryover from prior years plus 2023): 495
Total Completed Projects in 2023: 362
Avg # days from application to completion: 183

Utility Benchmarking:

Benchmarking among the CA IOU showed that each of the three major electric IOUs managed program offerings including various backup power solutions for customers impacted by PSPS. The program team conducted monthly coordination meetings with peer utilities to discuss regulatory updates, program changes, best practices, etc.

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Generator Grant Program
WMP Tracking ID	WMP.466

Description	**Generator Grant Program**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	-
Capital Expenditures Non-Labor	-	-	-	-	-
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
Capital Expenditures Indirect Costs	-	-	-	-	-
Capital Total	**-**	**-**	**-**	**-**	**-**
O&M Labor	0	15	83	288	386
O&M Non-Labor	592	5,062	7,812	3,264	5,079
O&M Direct Costs Subtotal	**592**	**5,078**	**7,896**	**3,552**	**5,465**
O&M Indirect Costs	3	35	92	262	187
O&M Total	**595**	**5,112**	**7,988**	**3,814**	**5,652**
Units					
Batteries*	-	-	2,310	921	**805**
FTE**	0.0	0.2	1.0	3.3	**4.3**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Generator Grant Program					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**592**	**5,078**	**7,896**	**3,552**	**5,465**
Labor	0	15	83	288	386
Non-Labor	592	5,062	7,812	3,264	5,079
Generator Grant Program Total	**592**	**5,078**	**7,896**	**3,552**	**5,465**

Business Purpose:

The Generator Grant Program (GGP) (WMP.466) focused on increasing resiliency among the most vulnerable customer segments to enable access to electricity for medical devices and critical appliances during a Public Safety Power Shutoff (PSPS) de-energization. The GGP offered portable backup battery units with solar charging capacity to customers, providing vulnerable customers a means to keep small devices and appliances charged and powered during PSPS de-energizations. The GGP, launched in 2019, focused on the needs of medical baseline (MBL) and Life Support customers in addition to other customers with access and functional needs in Tier 2 and Tier 3 of the High Fire Threat District (HFTD) who have experienced an outage due to a PSPS de-energization. In addition to providing the proactive service of backup battery deliveries during the year, GGP also provided PSPS in-event expedited battery delivery service (as a loaner for the duration of the period of concern) to homebound customers actively in scope for de-energization. This in-event expedited response service was managed in coordination with 211 San Diego.

Project Justification:

The GGP was launched in 2019 as an attempt to reach vulnerable customers in frequently impacted communities. SDG&E understands that, despite the safety benefits, there are inconveniences associated with PSPS de-energizations, and this program provides tools to help mitigate the impacts of PSPS de-energizations by increasing customer resilience. In addition, SDG&E is required though the Phase 3 Guidelines (Decision 21-06-034 , Rulemaking 18-12-005) to administer a program to support resiliency for customers that rely on electricity to maintain necessary life functions, including for durable medical equipment and assistive technology, by consulting with and offering customers adequate and appropriate support and services in preparation for and during the anticipated duration of a PSPS de-energization, and assisting customers with the use medical equipment for the duration of a PSPS de-energization. Such support and services for each customer may include, for example, free backup batteries that energize necessary equipment, transportation to a community resource center or other location of the customer's choosing, other forms of support identified in consultation with these customers, and any combination thereof.

Project Scope:

Customers were pre-qualified for GGP based on their HFTD Tier 2 or Tier 3 residency, history of PSPS de-energizations, and MBL enrollment or qualifying Access and Functional Needs (AFN) status. Qualifying customers were notified of program eligibility via a letter mailed to the residence at the start of each annual program cycle. The contracted third-party implementer then proactively reached out via phone to gather additional customer information to confirm eligibility, provide a resiliency survey to gauge existing PSPS resilience and knowledge of available resources, schedule an on-site visit to deliver the portable backup battery and solar charging panel if needed, and provide education on the proper usage of the unit. Previously participating customers were also able to reach out to SDG&E or the contracted third-party implementer to request diagnostic and warranty servicing on previously provided units.

During PSPS activations, customers who were dependent on medical devices and are in scope for de-energization may contact 211 San Diego for assistance. If those customers were unable to utilize other services such as transportation, hotel stays, etc., they could be offered portable backup batteries to aid in powering their critical device during a PSPS de-energization and/or provide backup power while making other arrangements for support. If offered a battery on loan, 211 would send the customer's information to the third-party implementer and the customer will then be contacted by the implementer to arrange a delivery time of the unit. During delivery, the implementer would assist with setup (if needed) and provide education and safety information. Once power was restored, the implementer would then contact the customer to schedule a day and time to pick up the backup battery. If the customer was eligible to receive a battery to keep per the regular GGP eligibility criteria, the implementer would deliver a brand new unit while they retrieve the loaner unit.

The work units in GGP are portable backup batteries, also referred to in the market as power stations, and a folding portable solar panel accessory used to charge the battery.

Cost Drivers:

The key components that drove costs are contracted vendor services (delivery, outreach and education, and other administrative and direct implementation costs) and the procurement of the backup batteries and solar panels that are provided to the eligible customers.

Project Timing and Phases:

The typical milestones in GGP were 1. customer outreach, 2. phone assessment, 3. on-site visit scheduling, and 4. on-site visit/delivery of services. Due to the nature of the service provided through GGP, the process was fairly straightforward with a relatively short turnaround time for completion. Once a customer was contacted by the implementer, or they reached out to the implementer after receiving an eligibility notification letter, delivery of the portable backup battery, or other requested on-site service, could take place within a couple of days to a couple of weeks. Timing from outreach to on-site visit could fluctuate depending on the amount of interest, often tied to likelihood of impending PSPS, or the individual customer's availability. Another factor affecting timing and process are availability of backup power units. This factor is managed through the careful analysis/monitoring of potential amount of eligible customers, PSPS likelihood, manufacturing and/or shipping issues, and consistent communication with suppliers and implementer to address risks of availability shortages.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy.

Project (Customer) Approval:
Each customer is pre-qualified for program participation based on a defined set of eligibility criteria, including HFTD tier, PSPS history, and MBL/AFN status. Only customers meeting these criteria are approved for participation enabling resources to be directed to those with the highest need or risk.

Service and Product Supplier Procurement:
In 2022, a Request for Proposal (RFP) was issued to identify a potential new program implementer and equipment supplier through a competitive solicitation. Invitations to bid were sent to companies identified as having the relevant experience and/or capability to implement a similar scope of work.
Service-provider bids were evaluated on: quality and completeness of the proposal, cost competitiveness, proposed strategies to overcome participation barriers, program process flow and operational approach, relevant experience, and social responsibility practices. Equipment-supplier bids were evaluated on: backup battery specifications and available features, cost competitiveness, supplier experience and past performance, strategies to address supply-chain challenges, and social responsibility practices. The solicitation process was managed by the Supply Management Department to stay in compliance with established procurement policies and procedures. Supply Management was responsible to confirming all bidders were evaluated using a consistent scoring methodology and were treated equitably throughout the procurement process.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.1.2.11.3. This program does not have specified targets. Planned O&M spend was $7,060,000.

Risk Identification and Mitigation:

Supply Chain Issues
Risk: Shortages/unavailability of battery manufacturing components and/or international shipping issues were a risk to the timing implementation of the program.
Mitigation: In addition to increased communication with the manufacturer to get ahead of any supply chain issues, SDG&E entered into a contract with a logistics provider to procure the batteries, house them, and ship them as needed directly to the program implementer. The logistics provider also served as our direct point of contact with the manufacturers and monitored the U.S. supply overseeing a sufficient amount being readily available in order to meet the anticipated demand based on estimated customer eligibility data and PSPS forecasts.
Fluctuating Customer Eligibility
Risk: Program can be challenging to plan and scale as customer eligibility changed due to PSPS activity.
Mitigation: Closely monitored notable changes in customer demographics that were tied to eligibility and wildfire and PSPS forecasting.

SDG&E's Generator Grant program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how the program reduces wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each targeted segment or asset class. This score was then compared against program costs to produce a unitless RSE value that reflected the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics demonstrating how the Generator Grant program contributes to measurable PSPS risk reduction and reliability improvement. This program does not affect wildfire risk, as it does not directly influence the likelihood or consequence of potential ignitions within SDG&E's service territory.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	395	0	118.55	4.33%	377.64
Tier 2	410	0	23.85	2.03%	72.98
Non - HFTD / WUI	0	---	---	---	---

Consideration of Alternative Solutions:

1. Do nothing - But SDG&E interpreted that as being inconsistent with Phase 3 guidelines (Decision 21-06-034, Rulemaking 18-12-005).
2. Total Cost Rebate only - Logistically challenging to provide a rebate that fully subsidized the cost of the backup battery as inventory, customer's different load requirements and consistent price fluctuations. This option continues to be evaluated as rebate platform technology and product availability change.
3. Permanent backup power - Costlier option not viable for all customers who would otherwise qualify for GGP.
4. Loaners only - Difficult to scale with varying PSPS response scope.

Coordination with Similar Programs

Program staff coordinated with other internal program teams and program implementer to verify pre-existing permanent backup power on site and/or previous participation in a permanent backup power program (e.g., Generator Assistant Program and Standby Power Program). Customers who already had permanent backup power installed or had already participated in a utility-supported program that provides permanent backup power (e.g., permanent propane generator, permanent backup battery, etc.) are not automatically eligible to participate in the Generator Grant Program.

Stakeholder Impact and Engagement:

GGP was part of the Access and Functional Needs Annual Plan. Program staff worked closely with AFN stakeholders including community based organizations, such as 211 San Diego, disability advocate groups, tribal representatives, etc., in the implementation of the program to amplify awareness and alignment with objectives. GGP was also presented to stakeholders in a 2023 Regional PSPS Working Group meeting. SDG&E also communicated with the public and our customers via our wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted communications and marketing campaigns to provide additional information to specific customers if they were eligible for the program.

Metrics:

Metrics involved in the management of the Generator Grant Program include:
customers eligible for program: 1,513
customers invited to program: 1,257
customers enrolled in program: 805
customer units delivered by program: 805

Utility Benchmarking:

Each electric CA Investor Owned Utility (IOU) administers their own no-cost portable backup battery program and all are targeted to customers who rely on medical or assistive devices. There are some minor variations in products/brands provided and customer eligibility specific to the IOU's individual customer base, infrastructure, and PSPS response. Joint utility program staff meets monthly to discuss regulatory updates, program changes, best practices, etc.

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Generator Assistance Program
WMP Tracking ID	WMP.467

Description	**Generator Assistance Program**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	-
Capital Expenditures Non-Labor	-	-	-	-	-
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
Capital Expenditures Indirect Costs	-	-	-	-	-
Capital Total	**-**	**-**	**-**	**-**	**-**
O&M Labor	-	54	147	146	59
O&M Non-Labor	-	693	597	613	223
O&M Direct Costs Subtotal	**-**	**746**	**744**	**759**	**282**
O&M Indirect Costs	-	29	66	79	29
O&M Total	**-**	**775**	**810**	**838**	**311**
Units					
Rebates*	-	-	735	140	**250**
FTE**	**-**	0.6	1.7	1.7	**0.7**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Generator Assistance Program					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**-**	**746**	**744**	**759**	**282**
Labor	-	54	147	146	59
Non-Labor	-	693	597	613	223
Generator Assistance Program Total	**-**	**746**	**744**	**759**	**282**

Business Purpose:

The Generator Assistance Program (GAP) (WMP.467) focused on enhancing resiliency for all customers who reside in the High Fire Threat District (HFTD) and may be impacted by Public Safety Power Shut-Off (PSPS) events. The program offered rebates for portable fuel generators and portable power stations to encourage customers to acquire backup power options to mitigate the impacts of PSPS de-energizations. The target audience was customers who reside within Tiers 2 and 3 of the HFTD and have experienced at least one PSPS de-energization since 2019. Eligible customers received program materials via mail and email campaigns and were directed to an online portal to verify account information and learn more about the program. In addition, customers enrolled in customer assistance programs were eligible for an enhanced rebate on these backup power solutions. The program also provided the option for customers to receive one rebate for a fuel generator and one rebate for a portable power station to accommodate various backup power needs.

Project Justification:

The program's objective was to inform customers about lower cost portable backup power solutions they can feasibly acquire in preparation for high wind events that may trigger the need for PSPS outages. SDG&E's Wildfire Mitigation Plan and Access and Functional Needs Plan highlight the need to support customers who have a history of PSPS outages, and access to backup power is a key component of customer preparedness and risk mitigation. The program provided information and guidelines on the types, sizes and safety features of backup power solutions, including a detailed qualified product list that is updated throughout the program cycle as technologies and standards evolve. To influence customer readiness, especially during month's leading up to typical high-wind seasons, the program actively marketed to all eligible customers through email and mail campaigns and encourages participation in the rebate program to reduce upfront cost on qualified units.

Project Scope:

The program worked with regularly refreshed customer account data for all customers who reside in the HFTD. Customers were pre-qualified for GAP based on their HFTD Tier 2 or 3 residency and history of PSPS de-energizations (and have not received a rebate in 2020 or 2021). Qualifying customers were notified of program eligibility via email and mail campaigns and were directed to an online portal to verify account information and learn more about the program. In addition, customers enrolled in the California Alternate Rates for Energy (CARE) program were eligible for an enhanced rebate. The program provided the option for customers to receive one rebate for a fuel generator and one rebate for a portable power station to accommodate various backup power needs.

Cost Drivers:

The key components of costs include:
- Program and project administration costs that represent activities related to contract management, customer identification, system processing/tracking, customer marketing and outreach, portal development/maintenance, customer application processing, retailer engagement, customer service, and additional administrative support.
- Customer rebates to reduce the upfront cost of backup power solutions which enhance preparedness and resiliency during PSPS outages.

Project Timing and Phases:

The program conducted customer data analysis to review key parameters that determine eligibility. These parameters included whether the service address was within the HFTD, PSPS outage history, account status, prior program participation, customer assistance program participation, and other factors. Eligible customers received program materials via mail and email campaigns and were directed to the online program portal to verify account information and learn more about the program. Customers learned about the types of rebates available, the list of qualified products and important safety guidelines for operating backup power units. Upon eligibility verification, the customer could choose to participate by requesting rebate coupon or submitting a post purchase application. A Qualified Product List was provided for the customer to choose their preferred product prior to purchasing. Websites and portals were updated annually to reflect any updates to the program. The deadline for participation was December 31st of the program year.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy.

Project (Customer) Approval: Each customer was pre-qualified for program participation based on a specific set of criteria (HFTD Tier, PSPS history), and eligibility was verified through the program application process. Participating customers were required to review and sign a customer participation agreement outlining the terms of the program.
Services Procurement: The program vendor partner was awarded a contract based on directly applicable experience, a history of high quality rebate program management with SDG&E, strong relationships with retailers who provide backup power units, and good standing with SDG&E's Supply Management team.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.1.2.11.4. This program does not have specified targets. Planned O&M spend was $1,000,000.

Risk Identification and Mitigation:

Although the Generator Assistance Program (GAP, WMP.467) does not reduce the likelihood or consequence of PSPS events, it meaningfully reduced the impact of PSPS on participating customers by improving access to backup power solutions. Customer participation was primarily driven by the expectation of power shutoffs during high-wind, wildfire-risk, or severe-weather conditions, and the program helped mitigate these impacts by enabling customers to maintain essential services during PSPS events. A key risk to program success was the potential shortage or unavailability of portable generators and related equipment. To address this, SDG&E worked closely with its vendor partner to develop a sufficient product availability at participating retail locations, thereby reducing supply-chain constraints and allowing customers ability to obtain backup power solutions when needed.

SDG&E's Generator Assistance program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how the program reduced wildfire, PSPS, and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each targeted segment or asset class. This score was then compared against program costs to produce a unitless RSE value that reflected the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics demonstrating how the Generator Assistance program contributes to measurable PSPS risk reduction and reliability improvement. This program does not affect wildfire risk, as it does not directly influence the likelihood or consequence of potential ignitions within SDG&E's service territory.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	140	0	27.32	1.00%	25.33
Tier 2	110	0	4.16	0.36%	10.12
Non - HFTD / WUI	0	---	---	---	---

Consideration of Alternative Solutions:

1. Do nothing - Without this program, customers would have less information about the value of backup power solutions available to provide temporary power to enhance preparedness and safety during PSPS outages. In particular, this applies to customers who move in to the high fire regions of the territory for the first time.
2. Direct installation of backup power solutions - permanent backup power solutions may not be feasible for a customer or efficiently installed due to various factors including building characteristics, cost to install/maintain, time to acquire, jurisdiction permitting, etc. and therefore offering customers a reduced-cost option (i.e., rebate) and a list of solutions with varying sizes and capabilities to which customers can choose among options, the program is able to serve a wide audience of customers.

Coordination with Similar Programs

The program coordinated with customer assistance programs to engage and offer participating customers with enhanced rebate offerings. Also, the program coordinated with other resiliency programs aligning appropriate participation based on eligibility based on cross-referencing of participation history.

Stakeholder Impact and Engagement:

The GAP is part of the Access and Functional Needs (AFN) Annual Plan and program staff worked closely with AFN stakeholders including community based organizations, such as 211 San Diego, disability advocate groups, tribal representatives, etc., in the implementation of the program to develop alignment of objectives and increase awareness. The GAP was also presented to stakeholders in a 2023 Regional PSPS Working Group meeting. SDG&E also communicated with the public and our customers via our wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted communications and marketing campaigns to provide additional information to specific customers if they will be eligible for the program.

Metrics:

Metrics involved in the management of the Generator Assistance Program include:
customers eligible for program: 49,259
customers invited to program: 49,259
customers applied to program: 529
customer units delivered by program: 251

Utility Benchmarking:

Each electric CA Investor Owned Utility (IOU) administers their own portable backup power rebate program and all are targeted to customers who experience PSPS. There are some minor variations in available products/brands, rebate levels, and customer eligibility specific to the IOU's individual customer base, infrastructure, and PSPS response. Joint utility program staff meets monthly to discuss regulatory updates, program changes, best practices, etc.

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Capacitor Maintenance and Replacement Program ("SCADA")
WMP Tracking ID	WMP.453

Description	**Capacitor Maintenance and Replacement Program ("SCADA")**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	161	260	588	233
Capital Expenditures Non-Labor	-	863	1,827	3,210	1,023
Capital Expenditures Direct Costs Subtotal	**-**	**1,024**	**2,087**	**3,799**	**1,256**
Capital Expenditures Indirect Costs	-	581	1,181	3,332	778
Capital Total	**-**	**1,605**	**3,268**	**7,131**	**2,034**
O&M Labor	-	-	-	-	-
O&M Non-Labor	-	-	-	-	-
O&M Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
O&M Indirect Costs	-	-	-	-	-
O&M Total	**-**	**-**	**-**	**-**	**-**
Units					
Capacitors*		30	50	58	**19**
FTE**	-	1.3	2.0	4.6	**1.8**
Imputed Authorized Direct Capital $					**1,880**
Imputed Authorized Direct O&M $					**-**

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
HFTD SCADA Capacitor Replacement					
Capital	**-**	**1,024**	**2,087**	**3,799**	**1,256**
Labor	-	161	260	588	233
Non-Labor	-	863	1,827	3,210	1,023
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
HFTD SCADA Capacitor Replacement Total	**-**	**1,024**	**2,087**	**3,799**	**1,256**

Business Purpose:

The Supervisory Control and Data Acquisition (SCADA) Capacitors Maintenance and Replacement Program replaced non-SCADA capacitors with a more modern SCADA-switchable capacitor or removed non-SCADA capacitors if the device was no longer required for voltage or reactive support. These modernized capacitors have a monitoring system to check for imbalances and isolate internal faults before they become catastrophic, leading to a potential ignition. SCADA capacitors also have the capacity for remote isolation and monitoring of the system by the distribution system operators, which provides additional situational awareness during both normal and extreme weather conditions.

Project Justification:

The SCADA Capacitors Maintenance and Replacement Program prioritized replacing or removing fixed capacitors from service and then addressed capacitors with switches. Both types of capacitors were modernized to a SCADA-switchable capacitor. The advanced protection equipment allows for remote monitoring by distribution system operators, which could detect and isolate issues before a capacitor rupture occurs, reducing the failure mode most likely to lead to an ignition.

Project Scope:

The SCADA Capacitors Maintenance and Replacement Program replaced non-SCADA capacitors with a more modern SCADA-switchable capacitor or removed non-SCADA capacitors if not required for voltage or reactive support. A work unit was defined as one capacitor removal or replacement at a specific longitude/latitude location on a distribution circuit. Multiple work units could be performed on a single circuit if required. In 2023, all 19 capacitor projects fell within the High Fire Threat District (HFTD) or wildland urban interface (WUI) with 2 located in Tier 3 of the HFTD, 4 located within Tier 2 of the HFTD and 13 located within the (WUI), which were densely populated areas with high vegetation risk adjacent to the locations. As SDG&E plans, maintains, and operates the entire electrical system to reduce wildfire risk, these locations were evaluated as part of the risk mitigation strategy.

Cost Drivers:

Key components driving costs in this program included vendor procured materials (capacitors and associated SCADA equipment), contract services (engineering, design and construction), warehouse material issuances (distribution poles), and labor (construction and management). SDG&E accomplished more work than planned while remaining under authorized costs, thus increasing risk reduction.

Project Timing and Phases:

Typical project timeline duration from initial scoping to project closeout was approximately 12 months and was completed in one contiguous phase. Milestones included project scoping, work order and budget creation, design review stage gates, permit coordination, issue for construction (IFC) packages, geographic information system mapping, material procurement, construction, post construction QA/QC inspection, as-built drawing documentation, and work order close-out. Major dependencies were related to coordination of permits, construction crew scheduling, and weather or holiday related event schedule delays.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

SDG&E completed 19 capacitors in 2023. Unit actuals provided reflect completed projects placed in service and recorded to SDG&E's WMPMA in 2023 and may be different than completed projects reflected in SDG&E's WMP reporting. Planned Capital spend was $1,885,000.

Risk Identification and Mitigation:

Risks identified and mitigated by the Capacitor Maintenance and Replacement Program included, but were not limited to:

1) Equipment Failure - This program increased the ability to detect and isolate issues before a capacitor rupture occurs, providing reduced ignition in HFTD, improved safety and reliability benefits.
2) System Reliability and Awareness - This program increased situational awareness due to the increased SCADA-enabled telemetry by removing other equipment without the SCADA-enabled telemetry.

SDG&E's Capacitor Maintenance and Replacement Program (SCADA) program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how the program reduced wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each targeted segment or asset class. This score was then compared against program costs to produce a unitless RSE value that reflected the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics demonstrating how Capacitor Maintenance and Replacement Program (SCADA) program contributed to measurable risk reduction. Note that for methodological consistency, units located outside the HFTD—but in close proximity to HFTD boundaries or within the WUI—were excluded from RSE calculations in this filing. For these locations, cross-boundary exposure and contextual factors can introduce modeling complexities that are not fully accommodated by the current RSE workbooks, making risk-reduction estimates less reliable. Accordingly, the table below reports RSE results only for units located within Tier 2 and Tier 3 HFTD areas, where the existing methodology most accurately reflects risk and benefits.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	2.00	0.0003	0.44	0.00%	58.24
Tier 2	4.00	0.0013	1.27	0.02%	83.69
Non - HFTD / WUI	13	---	---	---	---

Consideration of Alternative Solutions:

Do nothing. Capacitors are a key piece of equipment that is essential to the distribution system for voltage and reactive support. There is no other technology that performs this support at the distribution level where it is required. In addition, capacitors fail unpredictably and there is not a known maintenance/testing program that effectively prevents failures. This program introduced a new solution that can detect failures in advance and allow for remote isolation.

Coordination with Similar Programs

The Capacitor Maintenance and Replacement Program coordinated with other SDG&E programs by reviewing for project overlaps or redundancies prior to initiating and throughout the duration of the project to avoid duplicative efforts for both design and field work.

Stakeholder Impact and Engagement:

SDG&E coordinated with external Federal and State regulatory agencies to ensure compliance with environmental and permit requirements. SDG&E also communicated with the public and our customers via its wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted mailers and/or door tags to provide additional information to specific customers if they would be affected by fielding or construction activities.

Metrics:

SDG&E completing installation of nineteen (19) Capacitor Maintenance and Replacements in 2023.

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Expulsion Fuse Replacement Program
WMP Tracking ID	WMP.459

Description	**Expulsion Fuse Replacement Program**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	1,156	1,866	653	41	12
Capital Expenditures Non-Labor	2,696	4,813	5,967	644	27
Capital Expenditures Direct Costs Subtotal	**3,851**	**6,679**	**6,620**	**684**	**39**
Capital Expenditures Indirect Costs	3,256	4,985	4,531	646	34
Capital Total	**7,107**	**11,663**	**11,150**	**1,330**	**73**
O&M Labor	-	-	-	-	-
O&M Non-Labor	-	-	-	-	-
O&M Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
O&M Indirect Costs	-	-	-	-	-
O&M Total	**-**	**-**	**-**	**-**	**-**
Units					
Fuses*		3,180	3,477	225	**36**
FTE**	9.5	15.0	5.2	0.3	**0.1**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
HFTD Fuse Replacements					
Capital	**3,851**	**6,679**	**6,620**	**684**	**39**
Labor	1,156	1,866	653	41	12
Non-Labor	2,696	4,813	5,967	644	27
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
HFTD Fuse Replacements Total	**3,851**	**6,679**	**6,620**	**684**	**39**

Business Purpose:

The Expulsion Fuse Replacement Program replaced existing expulsion fuses with new, fire safe expulsion fuses approved by CAL FIRE in the High Fire Threat District (HFTD). These new expulsion fuses reduced the discharge expelled into the atmosphere, reducing the chance of a fuse operation leading to an ignition.

Project Justification:

When the distribution system experiences a fault or overcurrent, there are fuses connected to the system to protect its integrity and isolate the fault. These expulsion fuses were designed to operate by creating a significant expulsion within the fuse, resulting in the fuse opening and isolating the fault, and in turn limiting further damage to other equipment. Because of this internal expulsion, the fuses are equipped with a venting system that sends a discharge of energy out of the fuse and into the atmosphere. This external discharge has the potential to ignite flammable vegetation. The replacement fuses provide an increased fire safe version that has been tested and approved by CAL FIRE.

Project Scope:

The Expulsion Fuse Replacement Program replaced existing expulsion fuses in the High Fire Threat District (HFTD) with new, more fire safe expulsion fuses approved by CAL FIRE. A work unit is defined as one expulsion fuse per phase replaced at a specific longitude/latitude location on a distribution circuit. Multiple work units could be installed on a single circuit if required.

Cost Drivers:

Key components driving a majority of costs in this program included contract services (engineering, design and construction), material (expulsion fuses), and internal union or non-union labor (construction and management).

Project Timing and Phases:

Typical project timeline duration from initial scoping to project closeout is approximately 6-12 months and is completed in one contiguous phase. Milestones include project scoping, work order and budget creation, design review gates, permit coordination, issue for construction (IFC) packages, geographic information system (GIS) mapping, material procurement, construction, post construction quality assurance and quality control inspection, as-built drawing documentation, and work order close-out. Major dependencies were related to coordination of permits, construction crew scheduling, and weather or holiday related event schedule delays.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

SDG&E completed 36 fuses. Planned Capital spend was $93,000.

The costs reflected in the tables above represent the full scope of activities required to deliver these protection-system upgrades, including engineering, materials, construction, permitting, project management, and related support functions. Expenditures also encompass field mobilization, quality-assurance activities, and the coordination necessary to implement protection enhancements on circuits located in high-priority areas. These costs are consistent with the program's work plan and reflect the resources required to complete the units of work while maintaining compliance with applicable regulatory and safety requirements.

Risk Identification and Mitigation:

The risk addressed by the program was the reduction in ignitions by the operating of a overhead fuse.

SDG&E's Expulsion Fuse Replacement Program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how the program reduced wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each targeted segment or asset class. This score was then compared against program costs to produce a unitless RSE value that reflected the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics demonstrating how the Expulsion Fuse Replacement Program contributes to measurable wildfire risk reduction

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	0	0	-	0.00%	-
Tier 2	36	0.012	11.63	0.21%	5,190.99
Non - HFTD / WUI	0	---	---	---	---

Consideration of Alternative Solutions:

1. Do not perform the work - This was identified as not a feasible alternative given the known risk and improvement the new equipment provided.
2. Other Types - Other type of fuses were reviewed, but they were a higher price with limited additional value.

Coordination with Similar Programs

Expulsion fuse replacements (WMP.459) were installed concurrently with other asset replacement initiatives across the HFTD such as hotline clamp replacements (WMP.464), Avian protection equipment (WMP.972), and lightning arrester removal and replacements (WMP.550) to share costs such as design and construction, minimize impacts to the community and reduce planned outage duration.

Stakeholder Impact and Engagement:

SDG&E coordinated with external Federal and State regulatory agencies to ensure compliance with environmental and permit requirements. SDG&E also communicated with the public and our customers via our wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted mailers and/or door tags to provide additional information to specific customers if they will be affected by fielding or construction activities.

Metrics:

SDG&E completed 36 units total.

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Hotline Clamp Replacement ("HLC") Program
WMP Tracking ID	WMP.464

Description	**Hotline Clamp Replacement ("HLC") Program**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	0
Capital Expenditures Non-Labor	-	-	-	-	-
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**0**
Capital Expenditures Indirect Costs	-	-	-	-	-
Capital Total	**-**	**-**	**-**	**-**	**0**
O&M Labor	201	252	197	145	143
O&M Non-Labor	722	3,053	3,525	1,842	1,520
O&M Direct Costs Subtotal	**923**	**3,305**	**3,722**	**1,987**	**1,662**
O&M Indirect Costs	103	362	368	172	146
O&M Total	**1,026**	**3,667**	**4,090**	**2,160**	**1,808**
Units					
Hotline Clamps*	-	-	2,743	1,903	**967**
FTE**	1.7	2.0	1.6	1.1	**1.1**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
HFTD Hot Line Clamps					
Capital	**-**	**-**	**-**	**-**	**0**
Labor	-	-	-	-	0
Non-Labor	-	-	-	-	-
O&M	**923**	**3,305**	**3,722**	**1,987**	**1,662**
Labor	201	252	197	145	143
Non-Labor	722	3,053	3,525	1,842	1,520
HFTD Hot Line Clamps Total	**923**	**3,305**	**3,722**	**1,987**	**1,662**

Business Purpose:

The Hotline Clamp (HLC) Replacement Program replaced HLC connections that are connected directly to the overhead primary conductors with compression, wedge, or other approved connections, eliminating the risk of wire-down failure and the associated ignition risk. HLC connections were installed concurrently with other asset replacement initiatives across the High Fire Threat District (HFTD) and Wildland Urban Interface (WUI) such as lightning arrestors, avian protection, and fuses. Approximately 23% of the work performed in this initiative was in the WUI, which is outside of the HFTD. SDG&E elected to address specific equipment removals/replacements in the WUI that reasonably align with wildfire risk.

Project Justification:

Connectors that have been connected directly to overhead primary conductors, known as HLCs, are associated with creating a weak connection which could result in the conductor splitting and a wire down event. This in turn could lead to an energized wire either coming into contact with the ground or a foreign object where it could become a source of ignition.

Project Scope:

HLC Replacement Program replaced HLC connections that are connected directly to overhead primary conductors with compression, wedge, or other approved connections. A work unit was defined as one hotline clamp per phase replaced at a specific longitude/latitude location on a distribution circuit. Multiple work units could be installed on a single circuit if required.

Cost Drivers:

Key components driving a majority of costs in this program included contract services (engineering, design and construction), material (hot line clamps), and internal union or non-union labor (construction and management).

Project Timing and Phases:

Typical project timeline duration from initial scoping to project closeout was approximately 6-12 months and is completed in one contiguous phase. Milestones included project scoping, work order and budget creation, design review gates, permit coordination, issue for construction (IFC) packages, Geographic Information Systems (GIS) mapping, material procurement, construction, post construction Quality Assurance/Quality Control (QA/QC) inspection, as-built drawing documentation, and work order close-out. Major dependencies were related to coordination of permits, construction crew scheduling, and weather or holiday related event schedule delays.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

SDG&E completed 967 hotline clamps in 2023,. Planned O&M spend was $486,000.

Risk Identification and Mitigation:

The risk addressed by the program was associated with mitigating a conductor failure caused by a weak spot created by the clamp leading to a wire down.

SDG&E's Hotline Clamp Replacement (HLC) Program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how the program reduced wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each targeted segment or asset class. This score was then compared against program costs to produce a unitless RSE value that reflected the efficiency of risk mitigation per dollar invested.

The following table summarized key program metrics demonstrating how the Hotline Clamp Replacement (HLC) Program contributed to measurable risk reduction. Note the methodological consistency, units located outside the HFTD—but in close proximity to HFTD boundaries or within the WUI—were excluded from RSE calculations in this filing. For these locations, cross-boundary exposure and contextual factors can introduce modeling complexities that are not fully accommodated by the current RSE workbooks, making risk-reduction estimates less reliable. Accordingly, the table below reports RSE results only for units located within Tier 2 and Tier 3 HFTD areas, where the existing methodology most accurately reflects risk and benefits.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	107	0	3.89	0.04%	368.31
Tier 2	631	0.001	7.65	0.14%	122.80
Non - HFTD / WUI	229	---	---	---	---

Consideration of Alternative Solutions:

The only other alternative was to do nothing, which given the known risk was not a reasonable option.

Coordination with Similar Programs

This program was designed, engineered, and constructed in tandem with initiatives across the HFTD such as Expulsion fuse replacements (WMP.459), Avian protection equipment (WMP.972), and lightning arrester removal and replacements (WMP.550). Deploying these asset replacements together reduced the number of mobilizations for site visits, permitting, and construction crews, resulting in cost efficiencies in all project phases. Additionally, overlaps with other programs were identified during the scoping phase to avoid situations where an asset might be replaced or removed from service shortly after being put into service. This coordinated approach supported asset replacements and sectionalizing efforts that were both efficient and sustainable.

Stakeholder Impact and Engagement:

SDG&E coordinated with external Federal and State regulatory agencies aligning compliance with environmental and permit requirements. SDG&E also communicated with the public and our customers via our wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted mailers and/or door tags to provide additional information to specific customers if they will be affected by fielding or construction activities.

Metrics:

SDG&E completed 953 units total.

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Lightning Arrestor Removal and Replacement
WMP Tracking ID	WMP.550

Description	**Lightning Arrestor Removal and Replacement**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	7	437	493	451
Capital Expenditures Non-Labor	-	12	1,655	2,940	1,603
Capital Expenditures Direct Costs Subtotal	**-**	**20**	**2,092**	**3,434**	**2,054**
Capital Expenditures Indirect Costs	-	12	1,557	2,996	1,481
Capital Total	**-**	**31**	**3,649**	**6,430**	**3,536**
O&M Labor			4	2	20
O&M Non-Labor			7	15	66
O&M Direct Costs Subtotal	**-**	**-**	**11**	**17**	**86**
O&M Indirect Costs			3	(8)	23
O&M Total	**-**	**-**	**14**	**9**	**109**
Units					
Arrestors*		16	1,798	2,660	**2,199**
FTE**	-	0.1	3.4	3.7	**3.3**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Lightning Arrester Replacement Program					
Capital	**-**	**20**	**2,092**	**3,434**	**2,054**
Labor	-	7	437	493	451
Non-Labor	-	12	1,655	2,940	1,603
O&M	**-**	**-**	**11**	**17**	**86**
Labor			4	2	20
Non-Labor			7	15	66
Lightning Arrester Replacement Program Total	**-**	**20**	**2,103**	**3,451**	**2,140**

Business Purpose:

The Lightning Arrestors Removal and Replacement Program replaces existing lighting arrestors with approved CAL FIRE lightning arresters to mitigate the impact of the being an ignition source during operation. CAL FIRE approved lightning arrestors are equipped with an external device that operated prior to the arrestor overloading, dramatically reducing the potential of becoming an ignition source. Approximately 0.8% of the work performed in this initiative was in the Wildland Urban Interface (WUI), which is outside of the High Fire Threat District (HFTD). SDG&E elected to address specific equipment removals/replacements in the WUI that reasonably align with wildfire risk.

Project Justification:

Lightning arrestors are installed to protect electric power equipment from exceeding thermal insulation ratings in the event of surge voltages due to lightning strikes or other faults. The lightning arrestor enables a surge in the current to be diverted through the arrestor to a ground terminal and protect the insulation and conductors on the distribution system. The CAL FIRE approved lightning arrestors come with an external Spark Prevention Unit that operates prior to the arrestor overloading, dramatically reducing the potential of becoming an ignition source.

Project Scope:

The Lightning Arrestors Replacement Program installed CAL FIRE-approved lightning arresters to mitigate the impact of transient overvoltage on the electric system. A work unit was defined as lightning arrestor per phase replaced at a specific longitude/latitude location on a distribution circuit. Multiple work units may be installed on a single circuit if required.

Cost Drivers:

Key components driving a majority of costs in this program included contract services (engineering, design and construction), material (lightning arrestors), and internal union or non-union labor (construction and management).

Project Timing and Phases:

Typical project timeline duration from initial scoping to project closeout was approximately 6-12 months and is completed in one contiguous phase. Milestones included project scoping, work order and budget creation, design review gates, permit coordination, issue for construction (IFC) packages, Geographic Information System (GIS) mapping, material procurement, construction, post construction Quality Assurance/Quality Control (QA/QC) inspection, as-built drawing documentation, and work order close-out. Major dependencies were related to coordination of permits, construction crew scheduling, and weather or holiday related event schedule delays.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

SDG&E completed approximately 2,199 arrestors in 2023. Unit actuals provided reflect completed projects placed in service and recorded to SDG&E's WMPMA in 2023 and may be different than completed projects reflected in SDG&E's WMP reporting. Planned Capital spend was $3,407,000.

The costs presented in the tables above reflect the full set of activities required to complete this work, including engineering, materials procurement, construction, permitting, project management, and related support functions. Expenditures also account for field mobilization, quality-assurance activities, and the coordination necessary to implement overhead system upgrades in high-priority areas. These costs are consistent with the program's authorized work plan and represent the resources required to deliver the approved units of work while maintaining compliance with all applicable regulatory and safety requirements.

Risk Identification and Mitigation:

The risk addressed by the program was associated with mitigating a lightning arrestor operating and becoming an ignition source by replacing with CAL FIRE approved units.

SDG&E's Lightning Arrestor Removal and Replacement program applied the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how the program reduced wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluated safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each targeted segment or asset class. This score was then compared against program costs to produce a unitless RSE value that reflected the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics demonstrating how Lightning Arrestor Removal and Replacement program contributes to measurable risk reduction. Note that for methodological consistency, units located outside the HFTD—but in close proximity to HFTD boundaries or within the WUI—were excluded from RSE calculations in this filing. For these locations, cross-boundary exposure and contextual factors can introduce modeling complexities that are not fully accommodated by the current RSE workbooks, making risk-reduction estimates less reliable. Accordingly, the table below reports RSE results only for units located within Tier 2 and Tier 3 HFTD areas, where the existing methodology most accurately reflects risk and benefits.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	1780	0.064	100.2	1.03%	1,007.30
Tier 2	401	0.008	7.45	0.13%	332.63
Non - HFTD / WUI	18	---	---	---	---

Consideration of Alternative Solutions:

No other reasonable alternatives were identified for the Lightning Arrestor Removal and Replacement Program. SDG&E did not consider doing nothing a reasonable option.

Coordination with Similar Programs

This program was installed concurrently with other asset replacement programs such as Expulsion fuse replacements (WMP.459), Avian protection equipment (WMP.972), and Hot line clamp replacements (WMP.464). and was therefore designed, engineered, and constructed in tandem with those assets. Deploying these asset replacements together reduced the number of mobilizations for site visits, permitting, and construction crews, resulting in cost efficiencies in all project phases. Additionally, overlaps with other programs were identified during the scoping phase to avoid situations where an asset might be replaced or removed from service shortly after being put into service. This coordinated approach improved efficiency and sustainability in both asset replacements and sectionalizing efforts.

Stakeholder Impact and Engagement:

SDG&E coordinated with external Federal and State regulatory agencies to ensure compliance with environmental and permit requirements. SDG&E also communicated with the public and our customers via our wildfire safety website: https://www.sdge.com/our-commitment-wildfire-safety, wildfire safety fairs, and targeted mailers and/or door tags to provide additional information to specific customers if they will be affected by fielding or construction activities.

Metrics:

SDG&E completed 2,199 units total.

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Cleveland National Forest (CNF Distribution Overhead)
WMP Tracking ID	WMP.1017

Description	**Cleveland National Forest Power Line Replacement Project**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	1,313	3,102	2,260	60	71
Capital Expenditures Non-Labor	52,402	77,945	9,463	1,176	1,291
Capital Expenditures Direct Costs Subtotal	**53,715**	**81,047**	**11,722**	**1,236**	**1,362**
Capital Expenditures Indirect Costs	13,685	11,451	2,207	(91)	56
Capital Total	**67,400**	**92,498**	**13,930**	**1,145**	**1,418**
O&M Labor	-	2	22	89	87
O&M Non-Labor	-	1	222	2,119	570
O&M Direct Costs Subtotal	**-**	**4**	**245**	**2,208**	**658**
O&M Indirect Costs	-	-	17	132	42
O&M Total	**-**	**4**	**262**	**2,340**	**699**
Units					
Miles*	38	81	36	-	**-**
FTE**	10.8	25.0	18.0	1.1	**1.2**
Imputed Authorized Direct Capital $					**13,470**
Imputed Authorized Direct O&M $					**-**

*Historical unit counts are provided for reference and reflect total units reported in SDG&E's WMPs. As SDG&E's criteria for WMP reporting (energization) differed from requirements to be placed in service, historical units may not directly represent the units associated with complete project in-service dates.

**Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
CNF MSUP					
Capital	**-**	**-**	**-**	**-**	**1,362**
Labor	-	-	-	-	71
Non-Labor	-	-	-	-	1,291
O&M	**-**	**4**	**245**	**2,208**	**658**
Labor	-	2	22	89	87
Non-Labor	-	1	222	2,119	570
CNF MSUP Total	**-**	**4**	**245**	**2,208**	**2,019**

Business Purpose:

The purpose of the Cleveland National Forest Power Line Replacement Project was to mitigate wildfire risk by replacing aging electric infrastructure serving the U.S. Forest Service, emergency service facilities, campgrounds, residences, businesses, and other customers within and surrounding the Cleveland National Forest (CNF). The project was needed to address wildfire risk associated with existing infrastructure, consistent with CPUC policy and General Order 95, and to improve reliability of power delivery to communities in and around the CNF. Replacing the existing facilities reduces fire ignition potential, enhance system resilience, and provides continued, reliable electric service to the community.

Fire hardening work within CNF was completed in 2021. Work in 2023 solely consisted of access road improvements and the implementation of permit mandated environmental restoration, maintenance, and monitoring activities in accordance with the Project's Mitigation Monitoring, Reporting, and Compliance Program (MMCRP) and Habitat Restoration Plan (HRP).

Project Justification:

The CNF Power Line Replacement Project was necessary to improve public safety and electrical reliability by replacing electric infrastructure serving the United State Forest Service (USFS), emergency service facilities, campgrounds, residences, businesses, and other customers within and surrounding the CNF. The project was the most effective approach to reducing wildfire ignition risk and improving reliability in a high fire risk area. The project received all required regulatory approvals, including a Final Record of Decision issued by the USFS on March 11, 2016, and a Permit to Construct approved by the California Public Utilities Commission on May 26, 2016. Although the fire hardening work was completed in 2021, to maintain compliance with the MMCRP established for the project, SDG&E completed required environmental restoration activities in 2023, providing continued alignment with regulatory and environmental commitments.

Project Scope:

The distribution portion of the CNF Power Line Replacement Project completed in 2021 included:
- Rebuilding six 12 kV distribution lines and replacing or removing existing wood poles with fire-resistant weatherized steel poles.
- Adding a new underground 12kV circuit in the Mount Laguna area
- Relocation of a segment of a 12 kV circuit outside of the designated USFS Wilderness Areas

Fire hardening work within Cleveland National Forest was completed in 2021. The project scope for the 2023 consisted of access road improvements and the implementation of permit mandated environmental restoration, maintenance, and monitoring activities in accordance with the Project's Mitigation Monitoring, Reporting, and Compliance Program (MMCRP) and Habitat Restoration Plan (HRP). Restoration activities were organized into five phases corresponding to the phased construction schedule and encompass temporary disturbance areas requiring long term stabilization and revegetation to near preconstruction conditions.

Cost Drivers:

Key components driving a majority of costs in this program included vendor procured materials, contract services (consulting, engineering, design and construction), and internal labor. O&M charges included environmental field and desktop surveys, field monitoring, restoration of US Forest Service land impacted by construction activities (work areas, wire pulling sites, etc.). Capital costs included resources required to manage and construct engineered access road improvements and access road gate installation located on US Forest Service lands as required per the project mitigation measures.

Project Timing and Phases:

The construction phase of the Cleveland National Forest project was completed in 2021. In 2023, the project was in the closeout phase and the only remaining scope consisted of access road improvement and ongoing environmental restoration work as required by the MMCRP, which is expected to conclude in 2031.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis.

Contracted work was either competitively bid between qualified vendors or awarded directly to a vendor with a master service agreement which had previously been competitively bid. Procurement activities were conducted in consultation with the assigned Supply Management representative to ensure compliance with the company procurement policy and maintain transparency and fairness throughout the vendor selection process.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

There were no approved WMP targets for this program. Planned Capital spend was $1,471,000.

Risk Identification and Mitigation:

SDG&E identified the CNF Power Line Replacement Project to address wildfire ignition risk, public and worker safety risk, and electric system reliability risk associated with existing transmission and distribution facilities located in and adjacent to the Cleveland National Forest. SDG&E determined that continued operation of legacy overhead facilities in a high fire-threat environment presented elevated safety and reliability risks, particularly during adverse weather conditions. To mitigate these risks, SDG&E implemented engineering-based mitigation measures, including replacement of wood poles with fire-resistant steel poles, rebuilding and reconductoring existing transmission and distribution lines, selective undergrounding of certain facilities, and deployment of real-time weather monitoring to support operational decision-making. Environmental and regulatory risks associated with construction and operation on federally managed lands were addressed through a joint CPUC/USFS California Environmental Quality Act (CEQA) - National Environmental Policy Act (NEPA) environmental review (Environmental Impact Report/Environmental Impact Statement), consolidation of existing authorizations into a Master Special Use Permit, and issuance of a CPUC Permit to Construct, which included a MMCRP requiring implementation, monitoring, and reporting of adopted mitigation measures.

In accordance with the MMCRP, SDG&E completed environmental restoration work in 2023 as part of compliance with the mitigation and monitoring requirements established for the CNF project.

Consideration of Alternative Solutions:

Alternatives considered in the final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the Master Special Use Permit (MSUP) and Permit to Construct (PTC) dated June 2015 include those considered by SDG&E, the CPUC, Forest Service and the Bureau of Indian Affairs (BIA), as well as those identified by the general public and other agencies during the public scoping period. In addition to detailed consideration of SDG&E's proposed project, NEPA mandates the detailed consideration of the federal proposed action and the No Action Alternative, and CEQA requires consideration of a No Project Alternative. The following alternatives describe different approaches evaluated to address wildfire ignition risk, public and worker safety, and electric system reliability associated with existing transmission and distribution facilities in and around the Cleveland National Forest.

1. SDG&E's proposed project would include issuance of a MSUP for the SDG&E system, including 102 miles of electric lines and over 34 miles of access roads within the CNF and would replace/fire harden certain power lines within the SDG&E system totaling approximately 149 miles both on and off the CNF.

2. The Federal proposed action included proposals by the Forest Service, BIA, and Bureau of Land Management. The Forest Service proposal includes issuance of an MSUP for the SDG&E system in the Cleveland National Forest and modifies SDG&E's proposed project along TL626, C157 and C440. The BIA proposal also includes upgrades to facilities on La Jolla Reservation lands as proposed by the La Jolla Band of Luiseño Indians. The BLM proposal includes issuing ROW grants for portions of SDG&E's proposed power line replacement projects for TL629, TL625, and TL6923.

3. Under the No Action Alternative, the MSUP would not be issued for the existing electric lines, and the existing permits would terminate according to their terms. Those expired permits require the holder (SDG&E) to remove the existing 102 miles of electric lines and 45 miles of access road, and restore the site to conditions acceptable to the Forest Service. The Forest Service would manage the land under its jurisdiction consistent with the CNF Land Management Plan (LMP). Accordingly, no pole replacement, ground disturbance, or other project effects would occur associated with SDG&E's proposed project as no pole replacement, construction, or long-term operations and maintenance associated with the electric lines would be authorized on National Forest System lands. Under this alternative, SDG&E would need to redesign the existing electric system to avoid National Forest System lands in conformance with California Independent System Operator (ISO) requirements in order to meet the electric demand in their service territory.

4. Under the No Project Alternative, the existing alignments within the CNF would be maintained as they were, under their approximately 70 separate permits and easements. In addition, none of SDG&E's proposed power line replacement projects including proposed fire hardening activities would be authorized.

5. Undergrounding. Under this approach, selected segments of 12 kV and 69 kV lines would be relocated underground in high risk or environmentally sensitive areas. SDG&E would consider this option to eliminate overhead ignition sources, improve resilience, and reduce visual presence. Strengths included removal of overhead fire risks for targeted segments and improved performance during extreme wind conditions.

6.Partial Removal of Overland Access Roads. This alternative would remove up to 10.5 miles of exclusive use access roads that are in general greater than 25% grade and in close proximity to creeks, particularly along TL626 (Boulder Creek) and TL625 (Barber Mountain/Carveacre).

7. Removal of TL626 from Service. Under this alternative, TL626 would be removed from service. SDG&E would implement the necessary system upgrades and changes in order to provide service lost due to the removal of TL626.

There were no alternatives considered for the environmental restoration work performed in 2023, as this work was required under the project's MCCRP.

Coordination with Similar Programs

The CNF Power Line Replacement Project was coordinated with SDG&E's broader wildfire mitigation, electric system hardening, and vegetation management programs to ensure consistency across planning, execution, and post construction compliance activities. While fire hardening construction was completed in prior years, ongoing coordination in 2023 focused on aligning permit mandated environmental restoration and monitoring activities with other completed wildfire mitigation projects transitioning into long term stewardship phases. This coordination supported efficient use of environmental resources, consistent application of restoration standards, and alignment with Risk Assessment and Mitigation Phase (RAMP) identified mitigations and Wildfire Mitigation Plan reporting frameworks, so that CNF post construction obligations are managed in concert with similar mature hardening programs across SDG&E's service territory.

Stakeholder Impact and Engagement:

Stakeholder engagement for the CNF Power Line Replacement Project was conducted in accordance with SDG&E's established regulatory and community outreach practices for wildfire mitigation and infrastructure projects. Engagement included coordination with federal, state, and local agencies; consultation with land-managing authorities; and communication with affected communities and customers regarding construction activities, access, and safety considerations. These efforts were consistent with SDG&E's WMP community outreach framework, which emphasized transparency, early coordination, and ongoing communication to mitigate temporary construction impacts while advancing long-term public safety and system reliability benefits in high wildfire-risk areas.

Metrics:

The CNF Power Line Replacement Project was tracked through SDG&E's Wildfire Mitigation Plan and RAMP reporting frameworks as a Grid Design, Operations, and Maintenance mitigation activity. Construction related fire hardening work, including replacement of wood poles with steel poles and conductor upgrades within CNF boundaries, was completed in prior years. In the 2023 reporting period, performance metrics for the Cleveland National Forest (CNF) Power Line Replacement Project focused on habitat restoration outcomes and compliance with the Habitat Restoration Plan (HRP) rather than new construction outputs. Across all five restoration phases, 245 restoration areas achieved all final Year 5 success standards for restored physical conditions, native plant cover, nonnative plant cover, and native species diversity by the end of the reporting period. This included 3 sites in Phase I, 45 sites in Phase II, 24 sites in Phase III, 133 sites in Phase IV, and 40 sites in Phase V that met all final success criteria ahead of or within their applicable monitoring timelines. In addition, all remaining active restoration areas met at least the minimum success standards required for their respective restoration year, with many qualifying for regulatory sign off or alternative sign off. Progress was tracked through quantitative and qualitative monitoring and reported through SDG&E's Wildfire Mitigation Plan, RAMP, and General Rate Case reporting frameworks, consistent with CPUC and OEIS requirements.

Utility Benchmarking:

SDG&E benchmarked the CNF project against peer investor owned utilities through CPUC mandated wildfire mitigation, safety performance, and RAMP accountability frameworks, with benchmarking focused on both construction outcomes and post construction obligations. For mature wildfire mitigation projects such as CNF, where fire hardening construction was completed in 2021, benchmarking emphasized compliance with permit mandated environmental restoration, mitigation monitoring, and long term stewardship requirements rather than incremental hardening units. This approach was consistent with how other California utilities report and benchmark completed wildfire mitigation projects in high fire threat districts, where performance was evaluated based on regulatory compliance, sustainability of mitigation measures, and cost control during extended restoration and monitoring periods. CNF continued to align with RAMP identified safety mitigations and is tracked through WMP and GRC reporting mechanisms that support consistent comparison of post construction compliance performance across utilities.

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	LiDAR Inspections of Distribution Electric Lines and Equipment
WMP Tracking ID	WMP.484

Description	**Light Detection and Range (LiDAR) Inspections**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	-
Capital Expenditures Non-Labor	-	-	-	-	-
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
Capital Expenditures Indirect Costs	-	-	-	-	-
Capital Total	**-**	**-**	**-**	**-**	**-**
O&M Labor	-	-	0	1	0
O&M Non-Labor	-	-	1,150	3,000	873
O&M Direct Costs Subtotal	**-**	**-**	**1,151**	**3,001**	**873**
O&M Indirect Costs	-	-	6	23	9
O&M Total	**-**	**-**	**1,157**	**3,024**	**883**
Units					
	The variety of work activities in this category makes it infeasible to identify a single unit of measurement.				
FTE*	-	-	0.0	0.0	**0.0**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
LiDAR Inspections of Distribution Electric Lines and Equipment					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**-**	**-**	**1,151**	**3,001**	**873**
Labor	-	-	0	1	0
Non-Labor	-	-	1,150	3,000	873
LiDAR Inspections Total	**-**	**-**	**1,151**	**3,001**	**873**

Business Purpose:

Light Detection and Range (LiDAR) survey and capture was performed on all circuits within Tier 2 and Tier 3 of the HFTD between 2020 and 2022. No LiDAR capture was performed in 2023 under this initiative. However, the imagery and data captured in prior years continued to be processed via final milestone payments to the vendors who acquired, provided quality assurance, and used the data to updated the geospatial location accuracy of our overhead facilities of our enterprise geospatial system. The data provided was also used for multiple projects and program including overhead engineering and design for our overhead hardening programs that use Power Line Systems - Computer Aided Design and Drafting (PLS-CADD) design software, which provides pole loading calculations and conductor clearance analysis. The system hardening programs that used this data included covered conductor, traditional overhead hardening, and compliance work involving pole or crossarm replacements. LiDAR data was also used to verify post-construction compliance with General Order 95.

Project Justification:

Between 2020 and 2022, all circuits within the HFTD had LiDAR data captured and processed. In addition to providing granular data to efficiently perform distribution line analysis in the HFTD for programs such as the covered conductor program, LiDAR data was used to support other work including vegetation risk analysis where horizontal, vertical, and radial clearance checks can be performed to reduce the risk for tree strikes, tree fall-in, or vegetation contact as well as correcting missing or incorrect asset data in the asset inventory system of record. These corrections were recommended as areas of improvement by Energy Safety. (See ACI SDGE-22-19) Because the entire HFTD was captured, a large-scale LiDAR collection initiative will not be implemented for distribution for a few years.

Project Scope:

LiDAR survey and capture was performed on all circuits within Tier 2 and Tier 3 of the HFTD between 2020 and 2022. Approximately 3,000 miles of 12kV and below distribution lines were collected, where approximately 2,000 miles were in Tier 2 and 1,000 miles in Tier 3. No LiDAR capture was performed in 2023. Payments in 2023 were related to processing and delivery of data related to final milestone payments with vendors. The processing and delivery of data included:

1) Orthorectified imagery mosaic
2) Structure imagery (i.e., oblique photos)
3) Calibration report
4) Weather Report to be used by engineers for other programs that use PLS-CADD software to properly sag and tension conductors to perform structural analysis
5) Survey control report and monument sheets
6) Pole bottom list to be used in geospatial location updates in our enterprise mapping system and for use by other programs as necessary
7) Map book to help with referencing the extent of the data capture and processing
8) LiDAR files, including raw and feature coded LiDAR to SDG&E requirements
9) Tree strike analysis
10) Detailed vegetation clearance analysis across 10 specific circuits
11) Vegetation clearance analysis for all circuits looking a secondary distribution (<600V), primary distribution (600V - 12kV), transmission (69kV - 500kV) where collected with the distribution

Cost Drivers:

Cost drivers for LiDAR flight and data capture include:
1. Final payments to vendors for work done in prior years, including processing of data and providing results.
2. Digitization efforts to correct incorrect and/or missing asset data utilizing LiDAR imagery.

Project Timing and Phases:

LiDAR survey and capture was performed on all circuits within Tier 2 and Tier 3 of the HFTD between 2020 and 2022.
No LiDAR capture was performed in 2023.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.1.3.12. This program does not have specified targets for 2023. Planned O&M spend was $1,388,000.

Risk Identification and Mitigation:

This initiative did not have a risk spend efficiency because it did not directly reduce wildfire risk. LiDAR survey and capture on distribution lines were primarily used for grid hardening design efforts and post-construction verification rather than for identifying issues like the other inspection programs. See Risk Identification and Mitigation for grid hardening initiatives.

Consideration of Alternative Solutions:

LiDAR surveys have evolved into a foundational component for overhead distribution line engineering analysis and design. Starting in 2013 with the development of the Fire Risk Mitigation program, LiDAR was utilized for analysis of the distribution system for clearance and structural adequacy.

Coordination with Similar Programs

N/A

Stakeholder Impact and Engagement:

N/A

Metrics:

N/A

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Grid Design, Operations, and Maintenance
Category	Centralized Repository for Data
WMP Tracking ID	WMP.519

Description	**Centralized Repository for Data**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	305	620	585	422
Capital Expenditures Non-Labor	-	8,183	14,243	13,881	6,483
Capital Expenditures Direct Costs Subtotal	**-**	**8,488**	**14,863**	**14,466**	**6,905**
Capital Expenditures Indirect Costs	-	482	1,173	1,914	1,247
Capital Total	**-**	**8,970**	**16,036**	**16,380**	**8,152**
O&M Labor	-	-	-	-	-
O&M Non-Labor	-	-	-	-	-
O&M Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
O&M Indirect Costs	-	-	-	-	-
O&M Total	**-**	**-**	**-**	**-**	**-**
Units					
	-	-	-	-	-
	-	-	-	-	-
FTE*	-	2.2	4.4	4.1	**2.8**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	Prior Years Spend				Track 3
	2019	2020	2021	2022	2023
WMP WSD DATA SCHEMA					
Capital	**-**	**-**	**5,979**	**4,869**	**4,516**
Labor	-	-	184	188	280
Non-Labor	-	-	5,795	4,681	4,237
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
WMP WSD DATA SCHEMA Total	**-**	**-**	**5,979**	**4,869**	**4,516**
WMP Enpr Ast Mgmt Plform Ph2					
Capital	**-**	**6,279**	**5,306**	**1,638**	**(342)**
Labor	-	203	240	68	0
Non-Labor	-	6,077	5,066	1,570	(343)
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
WMP Enpr Ast Mgmt Plform Ph2 Total	**-**	**6,279**	**5,306**	**1,638**	**(342)**
WMP Advanced Analytics					
Capital	**-**	**-**	**753**	**4,279**	**2,441**
Labor	-	-	33	282	143
Non-Labor	-	-	720	3,997	2,298
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
WMP Advanced Analytics Total	**-**	**-**	**753**	**4,279**	**2,441**
WMP Data Foundation and Reporting					
Capital	**-**	**2,209**	**2,825**	**3,680**	**291**
Labor	-	102	164	46	-
Non-Labor	-	2,106	2,661	3,634	291
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
WMP Data Foundation and Reporting Total	**-**	**2,209**	**2,825**	**3,680**	**291**
Total	**-**	**8,488**	**14,863**	**14,466**	**6,905**

Business Purpose:

Wildfire Mitigation Plan (WMP) Wildfire Safety Division (WSD) Data Schema, Data Foundation & Reporting
The 2023 WMP.519 effort maintained and advanced the data platforms required to reliably support wildfire-mitigation operations, planning, and regulatory reporting. Work included sustaining the centralized data environment used for spatial and non-spatial Quarterly Data Report (QDR) reporting and enabling SDG&E to continue producing timely, accurate wildfire-risk data products. These enhancements strengthened the underlying data foundation used across wildfire-mitigation programs and provided traceability, consistency, and compliance with evolving reporting expectations.

WMP Advanced Analytics (WiNGS)
In parallel, the program advanced the Wildfire Next Generation System (WiNGS) analytics ecosystem through substantial system and model improvements. WiNGS 3.0 was delivered in 2023, providing a more robust operational and planning platform supported by a fully deployed system aligned with updated regulatory expectations. Both WiNGS-Operations and WiNGS-Planning underwent third-party software-implementation reviews, increasing transparency and technical assurance.

The program completed all major third-party recommendations, including model-standardization work, establishment of a structured internal model-review process, development of detailed documentation for all model versions, and expansion of analytical and project-management capacity. Migration of vegetation-risk modeling components to Amazon Web Services (AWS) SageMaker and the introduction of new vegetation-analysis pipelines improved system scalability and model performance. Collectively, these enhancements allowed SDG&E to meet evolving regulatory requirements and continue delivering reliable wildfire-risk analytics to support operational decision-making.

Project Justification:

WMP WSD Data Schema, Data Foundation & Reporting
In 2023, SDG&E made critical investments to meet expanding Energy Safety requirements for more consistent, accurate, and timely wildfire-mitigation data. Updated reporting standards and new expectations for QDR and geographic information system (GIS) submissions required utilities to demonstrate stronger data preparation, validation, and governance. To comply, SDG&E consolidated multiple data sources into a single, standardized environment aligned with Office of Energy Infrastructure Safety (OEIS) Data Guideline versions 3.0 and 3.1.
This unified data foundation improved the reliability, transparency, and traceability of wildfire-mitigation data used across reporting and operational programs, enabling SDG&E to meet current requirements and adapt to future regulatory changes.

WMP Advanced Analytics (WiNGS)
Operational needs also continued to grow, requiring faster and more dependable modeling to support daily wildfire-mitigation decision-making. Delivery of WiNGS 3.0 addressed this need by significantly improving model speed and reliability—reducing analytic runtimes from days to hours.
Independent third-party reviews of WiNGS-Planning and WiNGS-Ops identified enhancements needed to strengthen quality and consistency. SDG&E implemented all major recommendations in 2023, including model-development standardization, a formal model-review process, improved documentation, and expanded analytical capacity. The improvements enhanced transparency, reduced operational risk, and allowed SDG&E's analytics and modeling platforms to remain capable of meeting evolving regulatory and operational demands.

Project Scope:

WMP WSD Data Schema, Data Foundation & Reporting
The 2023 scope focused on maintaining and enhancing the data systems needed to support wildfire-mitigation reporting, operations, and planning. This included continued operation and improvement of the centralized data repository used for spatial and non-spatial QDR submissions, updated to meet OEIS Data Guideline versions 3.0 and 3.1.
Work included refining asset, vegetation, outage, and risk-event datasets; improving data structures; and consolidating multiple reporting processes into a single, consistent set of pipelines supporting both regulatory and internal needs. These updates strengthened data quality and reliability for regulatory filings, dashboards, and day-to-day wildfire-mitigation activities.

WMP Advanced Analytics (WiNGS)
A major portion of the 2023 scope involved advancing the WiNGS analytics platform, which provides modeling support for wildfire-mitigation operations and planning. Delivery of WiNGS 3.0 introduced a modernized modeling framework, faster processing speeds, and updates to underlying datasets and methodologies. Both WiNGS-Planning and WiNGS-Ops underwent independent third-party reviews, and all major recommendations—model-development standardization, a formal review process, complete documentation for active models, and increased analytical capacity—were fully implemented.
Vegetation-risk modeling components were migrated to a cloud-based environment to improve scalability and consistency. Significant front-end and back-end enhancements were also delivered to meet regulatory expectations and improve how risk information is presented for operational and planning use. The legacy WiNGS Beta system was retired to eliminate duplication, and WiNGS-Planning was enhanced with span-level detail to improve risk-assessment granularity.

Collectively, these efforts delivered the data, system, and analytical improvements needed to maintain regulatory compliance, strengthen operational decision-making, and continue evolving SDG&E's wildfire-mitigation analytics capabilities.

Cost Drivers:

WMP WSD Data Schema, Data Foundation & Reporting
The primary direct cost drivers in 2023 were external services and internal labor required to operate, update, and enhance SDG&E's wildfire-mitigation data environment. Most direct spending supported maintenance and improvement of the centralized data repository, including the updates needed to align with OEIS Data Guideline versions 3.0 and 3.1.
Contracted data-engineering and technical resources delivered essential work such as system enhancements, cloud-migration support, modeling updates, and new data-pipeline development. These services enabled SDG&E to refresh spatial and non-spatial QDR processes and consolidate previously duplicated reporting pathways into unified, reliable pipelines. Internal labor contributed to data ingestion, reporting-logic updates, and completion of required validation work. Overall, direct costs in this workstream reflect the activities necessary to meet updated Energy Safety reporting standards and to maintain a compliant, high-quality data foundation.

WMP Advanced Analytics (WiNGS)
A significant portion of 2023 direct costs supported creating WiNGS 3.0 and related enhancements to SDG&E's wildfire-risk modeling capabilities. Spending included updates to model methodologies, development of new 2023 fire-season models, integration of new training datasets, and performance improvements that substantially reduced model-run times.
Contracted analytics and engineering support was also required to complete independent third-party reviews of WiNGS-Planning and WiNGS-Ops and to implement all major recommendations, including model-standardization work, documentation development, and establishment of strengthened review processes. Additional direct costs supported cloud-based vegetation-risk modeling improvements and front-end and back-end updates required for regulatory alignment. Internal labor supported model validation, reporting-logic development, and implementation of third-party recommendations. Direct spending also reflects the retirement of the legacy WiNGS Beta system and the transition of WiNGS-Planning to span-level resolution.

WMP Enpr Ast Mgmt. Platform Ph2
Reversal of charges from 2022.

Project Timing and Phases:

WMP WSD Data Schema, Data Foundation & Reporting
The 2023 work followed a structured sequence of updates to the centralized data platform. Early-year activities focused on meeting OEIS Data Guideline versions 3.0 and 3.1, including updates to data structures, ingestion pipelines, and reporting workflows supporting QDR submissions. These updates strengthened data quality, consistency, and validation across asset, vegetation, outage, and risk-event datasets. By mid-year, work transitioned to stabilizing and integrating these improvements, consolidating reporting pathways, and maturing the data processes used for both internal and regulatory reporting. As the systems stabilized in the second half of the year, the focus shifted toward sustaining ongoing operations, managing backlog items, and supporting continuous improvement through Agile workflows. Enterprise Asset Management (EAM) Platform Phase 2 activities were limited in 2023, with no new build phases; work was restricted to final financial adjustments associated with prior implementation efforts.

WMP Advanced Analytics (WiNGS)
Updates to the WiNGS analytics environment followed a parallel phased structure. Early in the year, WiNGS-Planning and WiNGS-Ops underwent formal independent third-party reviews, which informed a sequenced set of improvements incorporated throughout the year.
Mid-year development centered on delivery of WiNGS 3.0, which introduced updated model methodologies, new training datasets, and significant performance enhancements that reduced model-run times and improved operational readiness. Ongoing development cycles incorporated all third-party recommendations, including standardized model-development practices, a formal internal model-review process, expanded documentation, and improved cross-team alignment. In the second half of the year, additional enhancements were deployed. The system received required front-end and back-end updates to meet regulatory expectations and improve the usability of wildfire-risk information for operations and planning. Vegetation-risk modeling components were migrated to a cloud-based environment to support more scalable and consistent processing. WiNGS-Planning was transitioned to span-level analysis, providing more granular visibility into asset-level risk. The legacy WiNGS Beta system was retired to eliminate duplication and maintain a single, authoritative modeling platform.

Approval Process/Procurement Process:

The program was approved in accordance with SDG&E's Approval and Commitment Policy.

WMP WSD Data Schema, Data Foundation & Reporting
Procurement activities for data-platform work followed SDG&E's existing contracting and vendor-management procedures. External technical partners were engaged through competitively bid or pre-qualified agreements to provide specialized data engineering, system enhancements, cloud-migration work, and other data-management services tied to updated regulatory requirements. All work was executed under formal purchase orders and statements of work that defined deliverables, oversight responsibilities, and timelines.
No new procurement activity was required for the EAM Platform Phase 2 work. 2023 spending reflected only final financial adjustments associated with previously approved efforts.
Overall, these governance and procurement processes helped transparency, proper oversight, and the timely acquisition of required technical expertise.

WMP Advanced Analytics (WiNGS)
Enhancements—including delivery of WiNGS 3.0, updates to model methodologies, integration of new datasets, and required improvements—were authorized internally. These approvals assisted with continued compliance with Energy Safety expectations, OEIS requirements, and operational needs for timely wildfire-risk modeling. Procurement for analytics-related work used SDG&E's standard competitive or pre-qualified vendor processes. Specialized contractors were selected based on their experience with wildfire-risk analytics, ability to support Energy Safety-driven requirements, and technical capabilities in modeling, cloud-based processing, and system development. Third-party firms conducted independent reviews of WiNGS-Planning and WiNGS-Ops under formally executed agreements that defined scope, deliverables, and review responsibilities. Internal teams worked closely with procurement to secure the external expertise required to complete third-party recommendations, deliver WiNGS 3.0, update risk-analysis workflows, and implement required enhancements. No new procurement was needed for EAM-related analytics work.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.1.5.4.1. This program does not have specified targets.

Risk Identification and Mitigation:

There were no approved WMP targets for this program. Planned Capital spend was $11,819,000. Planned O&M spend was $1,944,000.

Consideration of Alternative Solutions:

WMP WSD Data Schema, Data Foundation & Reporting
Several alternatives were evaluated for the 2023 data-platform work but were determined to be insufficient to meet regulatory and operational requirements.
1. Do Nothing
Maintaining the prior decentralized data approach was not feasible. Older data structures and inconsistent source systems could not support QDR or GIS submissions under OEIS Data Guideline versions 3.0 and 3.1. The existing processes lacked the consistency, validation, and reporting capabilities needed for updated Energy Safety expectations.
2. Limit Upgrades
Limiting changes to basic maintenance would not have addressed required updates to data structures, ingestion pipelines, or reporting workflows. This approach would have perpetuated inconsistencies across datasets and reporting outputs, preventing SDG&E from meeting new data-quality and validation standards.
3. Retain On-Premises Processing
Continuing to process vegetation-related datasets in the prior on-premises environment was evaluated and rejected. The legacy infrastructure did not provide the scalability, reliability, or processing capacity needed to support increased data volumes and more complex reporting requirements.
Conclusion
A centralized, modernized data platform—aligned with OEIS guideline updates and supported by improved pipelines and reporting workflows—was the only viable approach for meeting 2023 regulatory and operational needs.

WMP Advanced Analytics (WiNGS)
Alternatives to the selected 2023 analytics and modeling approach were also evaluated but found inadequate to meet requirements for speed, transparency, and consistency.
1. Do Nothing
Maintaining older versions of WiNGS, including the retired WiNGS Beta system, was not feasible. These versions had slower model-run times, inconsistent development practices, limited documentation, and could not meet the turnaround times required for operational wildfire-risk modeling.
2. Limit Upgrades
A minimal-change approach would not have resolved the findings from the independent third-party reviews of WiNGS-Planning and WiNGS-Ops. The recommended improvements—standardized model-development practices, a formal internal review process, and strengthened documentation—were essential for producing consistent and transparent modeling outputs.
3. Maintain Legacy Processing and Limited Enhancements
Retaining legacy, on-premises processing for vegetation-risk components was not viable due to scalability and reliability limitations. Similarly, restricting updates to only minor enhancements would not have met regulatory expectations for complete and consistent representation of wildfire-risk information

Coordination with Similar Programs

The work performed under WMP.519 in 2023 required extensive coordination with a broad range of wildfire-mitigation programs because the centralized data repository and the WiNGS analytics environment supply the underlying data, modeling outputs, and reporting structures used across nearly all WMP initiatives. The centralized repository provides standardized, validated data for the Quarterly Data Report (QDR), which is required for numerous programs, including Summarized Risk Map (WMP.442), Wildfire-Related Data and Algorithms (WMP.521), Allocation Methodology Development and Application (WMP.523), Covered Conductor Installation (WMP.455), Strategic Undergrounding (WMP.473), Distribution Underbuild (WMP.545), Distribution Overhead System Hardening (WMP.475), Microgrids (WMP.462), Advanced Protection (WMP.463), Early Fault Detection (WMP.1195), Distribution Communications Reliability Improvements (WMP.549), Avian Protection (WMP.972), Strategic Pole Replacement (WMP.1189), Wireless Fault Indicators (WMP.449), PSPS Sectionalizing Enhancements (WMP.461), Standby Power (WMP.468), Generator Grant and Assistance Programs (WMP.466, WMP.467), Distribution and Transmission Inspections (WMP.478, WMP.479, WMP.481, WMP.483, WMP.552, WMP.488), Capacitor Maintenance (WMP.453), Expulsion Fuse Replacement (WMP.459), Hotline Clamp Replacement (WMP.464), Lightning Arrestor Replacement (WMP.550), Cleveland National Forest Operations (WMP.1017), LiDAR Inspections (WMP.484), Fuels Management (WMP.497), Brushing (WMP.512), Tree Planting (WMP.1325), Weather Stations and NDVI Cameras (WMP.447), Air Quality Monitoring (WMP.970), Fire Potential Index (WMP.490), High-Performance Computing (WMP.541), Public Emergency Communications (WMP.563), Aviation (WMP.557), Suppression Resources (WMP.514), Emergency Preparedness (WMP.1008), and Community Engagement (WMP.1337), among others.

Because these programs rely on consistent, high-quality data, the improvements made in 2023—such as WiNGS 3.0, vegetation-model enhancements, and standardized modeling practices—directly supported accurate reporting and operational decision-making across all dependent WMP efforts. Coordination with GIS Regulatory Reporting and the OEIS Data Aggregation team assisted with spatial and non-spatial reporting requirements to be met, while collaboration with operational programs data pipelines and modeling updates aligned with field and planning needs. Together, this coordination provided a unified, consistent foundation for wildfire-mitigation reporting and analysis.

Stakeholder Impact and Engagement:

WMP WSD Data Schema, Data Foundation & Reporting
The 2023 WMP.519 work delivered direct benefits to both internal and external stakeholders by improving the accuracy, consistency, and timeliness of wildfire-mitigation data relied on across SDG&E and by oversight agencies. Internal teams—including Wildfire Mitigation Operations, Planning, Vegetation Management, Asset Management, GIS, and inspection-related programs—benefited from improved data quality and more reliable reporting outputs supported by updates to the centralized data repository. These enhancements strengthened daily operational decision-making, supported more granular risk visibility, and helped guide mitigation programs to receive consistent data for both field activities and strategic planning.
External stakeholders, including Energy Safety, received more transparent and standardized QDR and GIS submissions due to improved data structures, stronger validation processes, and clearer documentation. Ongoing coordination with Energy Safety's Data Aggregation and GIS Reporting functions provided updates to data pipelines and reporting logic to align with current expectations. The enhancements also improved SDG&E's responsiveness to regulatory data requests by increasing consistency and scalability within the data environment. Overall, these improvements strengthened the quality and reliability of wildfire-mitigation data shared with both internal users and regulatory entities, supporting transparency and clearer demonstration of mitigation progress.

WMP Advanced Analytics (WiNGS)
Updates to WiNGS 3.0 delivered significant stakeholder benefits. Internal users relied on faster model outputs, more consistent methodologies, and enhanced span-level planning capabilities to support day-to-day wildfire-mitigation operations and field-deployment decisions. The shift to cloud-based vegetation-risk modeling improved scalability and enabled more timely analytical updates for operational and planning needs. External stakeholders benefited from improved modeling transparency, strengthened documentation, and the completion of independent third-party recommendations for WiNGS-Planning and WiNGS-Ops. These updates improved the clarity, traceability, and reliability of the analytical information SDG&E provides during regulatory review. Enhancements also supported better communication of system conditions, mitigation actions, and underlying risk drivers in a standardized format.

Metrics:

WMP WSD Data Schema, Data Foundation & Reporting
Key 2023 outcomes included operating a centralized data lake that supported both spatial and non-spatial QDR reporting and consolidating multiple datasets into standardized core data products aligned with OEIS Data Guideline versions 3.0 and 3.1. The program supported submission of 2,204 non-spatial QDR metrics across 15 tables, with automated logic updated for 1,370 metrics to comply with v3.1 requirements. Curated data products were developed for assets, vegetation inspections, and risk events, enabling expanded metrics such as grid-condition findings and fixes, inspection-cycle timing, and work-order tracking. These pipelines supported regulatory submissions, internal dashboards, analytics, and efficacy assessments. Work was sustained by dedicated staff using Agile processes to manage enhancements and prioritize the backlog. Collectively, these data-platform improvements strengthened the consistency, transparency, and usability of wildfire-mitigation data across internal and regulatory stakeholders.

WMP Advanced Analytics (WiNGS)
The WMP Advanced Analytics work delivered several significant performance and capability improvements in 2023. WiNGS 3.0 reduced the runtime for historical wildfire-risk models from seven days to seven hours, improving the timeliness of operational analysis. Four new wildfire-risk models were developed for the 2023 fire season, supported by updated methodologies and expanded training datasets. WiNGS-Planning was enhanced to provide span-level visibility, enabling more precise assessment of localized wildfire-risk drivers. Front-end and back-end updates to meet regulatory expectations and improve visualization of operational and planning data. Completion of independent third-party recommendations—covering model-standardization practices, documentation, and internal review processes—strengthened the quality, transparency, and reliability of all modeling outputs.

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Vegetation Management and Inspections
Category	Fuels Management
WMP Tracking ID	WMP.497

Description	**Fuels Management**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	-
Capital Expenditures Non-Labor	-	-	-	-	-
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
Capital Expenditures Indirect Costs	-	-	-	-	-
Capital Total	**-**	**-**	**-**	**-**	**-**
O&M Labor	119	109	33	44	72
O&M Non-Labor	4,976	5,697	3,412	8,050	3,999
O&M Direct Costs Subtotal	**5,095**	**5,807**	**3,446**	**8,094**	**4,071**
O&M Indirect Costs	119	107	944	356	60
O&M Total	**5,214**	**5,914**	**4,390**	**8,450**	**4,131**
Units					
Pole Areas Treated	393	651	203	500	**514**
Poles in Grant Areas	161	264	261	402	**381**
Total Acres	139.0	773.6	368.1	475.5	**543.9**
FTE*	1.4	1.3	0.4	0.5	**0.8**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Fuels Thinning					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**4,770**	**5,216**	**2,392**	**6,685**	**1,754**
Labor	119	109	33	44	72
Non-Labor	4,651	5,106	2,358	6,641	1,682
Fuels Thinning Total	**4,770**	**5,216**	**2,392**	**6,685**	**1,754**
Fuels Grants					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**325**	**591**	**1,054**	**1,200**	**1,689**
Labor	-	-	-	-	-
Non-Labor	325	591	1,054	1,200	1,689
Fuels Grants Total	**325**	**591**	**1,054**	**1,200**	**1,689**
Arborist Training					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**-**	**-**	**-**	**209**	**628**
Labor	-	-	-	-	-
Non-Labor	-	-	-	209	628
Arborist Training Total	**-**	**-**	**-**	**209**	**628**
Total	**5,095**	**5,807**	**3,446**	**8,094**	**4,071**

Business Purpose:

The National Parks Service states that the objective of a fuels management program is "to mitigate the risk of negative impacts from wildfire and/or restore and maintain healthy landscapes." (National Park Service Reference Manual #18: Wildland Fire Management, Chapter 7 - Fuels Management, October 2023). SDG&E adopted the same objective for its Fuels Management program. To mitigate negative impacts, SDG&E focused its activities in areas that reduce the risk of an ignition growing into a catastrophic fire. Through reducing the probability of an ignition growing into a impactful fire, fuels management provided value to surrounding areas, regardless of the potential ignition source.

Project Justification:

Fuels Management activities have been established as a best practice for mitigating the risk of ignitions, evidenced by the fact these practices have been used by both fire agencies and entities like Caltrans, BLM, and other land managers. Fuels Management and Defensible space practices are also written into codes and regulations at local, state, and federal levels. While estimates varied, the cost to benefit ratio of prevention compared to the impact of a potential fire was also favorable.

The Utility Line Clearance Arborist (ULCA) training requirement is mandated by the California Public Utilities Commission (CPUC) through General Order 95 (GO 95), Rule 35, in conjunction with Cal/OSHA Title 8, Article 37. The training program included in this section was designed to enhance the available workforce and provide opportunity to individuals from California Conservation Corps (CCC) and Urban Corps of San Diego. (Note, this is sometimes referred to as Qualified Line-Clearance Tree Trimmer training)

Project Scope:

This program includes three distinct activities: the reduction of fuels to a 50-foot radius around poles in HFTD areas (Targeted reduction of fuels), SDG&E's Fuels Grant Program that partners with fire safe councils, tribal nations, and community groups to execute projects within and adjacent to utility ROWs, and the Utility Line Clearance Arborist (ULCA) training program. Work units identified below are in poles treated, acres of treatment, and cohort sessions of students.

Targeted Reduction of Fuels -
$1,754,196 of the $4,071,340.51 listed in JW-60 was allocated to the reduction of fuels surrounding 514 poles within the HFTD. As stated on JW-66, these activities reduced wildland fuel to a 50-foot radius from selected poles. While not completely removing fuels, the activity treats roughly 24 times the overall area (square feet) as is treated when pole brushing with PRC 4292 requirements (πr^2 with radius changing from 10 -->50). This increase in area requires larger crews, is more labor intensive as there is more material to remove, and includes increased environmental mitigation measures.

SDG&E Fuels Management Grants -
$1,689,253 of the $4,071,340.51 listed in JW-60 was allocated to the Fuels Grant program. This roughly $1.6M is further divided into project specific grants with the Pala Band of Mission Indians ($93k), Viejas Band of Kumeyaay Indians ($75k), Campo Band of Mission Indians ($21k), and the Greater Fire Safe Council of San Diego County ($1.5M) (The Greater Fire Safe Council redistributes funds to fire safe councils within the SDG&E service territory with direction provided from SDG&E as to priorities and requirements). The grants sought to mitigate the risk of an ignition from the utility system turning into a fire. The secondary benefit of this program is that these projects provide for mitigation for all fire types for the surrounding communities and also increase the survivability of the utility infrastructure if a fire would burn toward them. For the time period referenced, the project associated with this program provided mitigation in areas under and adjacent to 586 poles, 365 acres, 502 homes, and 24 miles of roadside.

Utility Line Clearance Arborist (ULCA) -
About $627,000 of the $4,071,340.51 listed value in JW-60 table was allocated to the Utility Line Clearance Arborist (ULCA) training program . This program originally began 2021. The CPUC identified a need for increase workforce and professional training of utility vegetation management workers. SDG&E adopted the program in mid-2021. Program students are individuals currently enrolled with the California Conservation Corps (CCC) and Urban Corps of San Diego, and interested individuals from the general public seeking a new career opportunity. The cost of the ULCA training is ~ $209k per cohort session. This program meets the requirements in California Public Utilities Code Section 8386.3(d) and SDG&E notified the commission in this accepted advice letter blob: https://tariffsprd.sdge.com/0ca3a942-5cc9-4155-b0ae-7637106f9233.

Cost Drivers:

The primary cost drivers are the cost and skill requirements for labor, available project scopes (including if a project area has been treated in the past), and environmental regulations governing project areas. For example in 2019, when targeted fuel reduction began around poles, all 393 poles were receiving their first treatment. By 2023, 423 of the 514 poles were being maintained which reduced costs significantly on a per pole basis. The environmental requirements also shift as more non-native species are removed and habitat is potential created. Project scope within grant projects may also shift from year to year with the various priorities of the region. There may also be projects that treat a larger number of acres with a smaller number of poles that end up creating more value to the service territory on a whole. For example, as can be seen in the images provided, roadside treatments may not have as many poles or acres associated but the roadbed serves as a force multiplier for the effectiveness and value of the treatment.

Project Timing and Phases:

Reduction of Fuels

The primary phases included planning and assessment (identifying risk, environmental review), implementation, and monitoring/maintenance (assessing effectiveness and maintaining fuel breaks over time). During the planning phase, target poles were identified utilizing a subset of poles that were already subject to PRC 4292 and had been identified using the methodology establish by CALFIRE and published in the Powerline Equipment Identification Guide as posing a risk for an ignition. Environmental and land access was then considered with the final project poles being selected based on viability of successful treatment and potential risk reduction.

SDG&E Grants

Mirroring the same strategy as fire agencies and other stakeholders, projects were identified, prioritized, and then executed based on perceived value and risk reduction.

Utility Line Clearance Arborist (ULCA)

This training program was a 200-hour course and focuses on the safety measures that are necessary to clear or trim trees around power lines. The training typically took place over a 5 week period with students being prepared to meeting the requirements for work at the end of the course.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. Project planning incorporated anticipated requirements for vendor procured materials, warehouse materials, internal labor, and contract labor necessary to complete the work. Projects were defined in advance and maintained in a project backlog, from which they were prioritized and approved for initiation. Construction was completed on a time and materials basis

In collaboration with Supply Management and in compliance with the Company's Procurement Policy, competitive sourcing activities are conducted to select qualified contractors to support the fuels management and vegetation management programs. These sourcing efforts include a comprehensive qualification process in which potential bidders are evaluated against established criteria such as safety performance, utility experience, past work performance, contractual rates, sustainability practices, resource availability, professionalism, and overall risk management.

Following this evaluation, long-term master agreements are negotiated and executed with selected contractors. These agreements establish standardized terms, conditions, and pricing structures that enable efficient engagement for fuels management services. When services are required, contractors are selected through a requisition process that identifies the specific program need and initiates the establishment of a program-specific agreement to support either fuels management program support or pole brushing services. As part of this process, proposed rates are reviewed for competitiveness and reasonableness in accordance with prevailing market conditions and bidder submittals creating alignment with industry standards and procurement best practices.

Supply Management is responsible for engaging with the selected contractors to formalize the agreement, either by negotiating rates or applying previously established long-term rates, and by defining program parameters used to monitor compliance and performance. Each agreement is then subject to an internal approval process to enable properly review and alignment with company requirements. This review confirms that all contractual elements—including scope of work, rates, terms and conditions, and performance expectations—are appropriately established prior to execution.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The Fuel Management (WMP .497) had a target of 500 poles in 2023. Planned O&M spend was $7,011,000.

Risk Identification and Mitigation:

Reduction of Fuels and SDG&E Grants

Fire mitigation must address at least one element of what a fire needs to burn--heat, oxygen, and fuel. The reduction of fuels reduces the intensity of a fire, which can slow its rate of speed, limit the damage it may cause, and increase the probability of suppression success.

Utility Line Clearance Arborist (ULCA)

By increasing the capabilities of those who are working around utility infrastructure and supporting the CPUC required qualifications, this program provided personnel with the tools needed to safely prevent vegetation from coming into contact with utility equipment.

SDG&E's Fuels Management program applies the Risk Spend Efficiency (RSE) framework, grounded in the Multi -Attribute Value Function (MAVF) methodology, to quantify how the program reduces wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluates safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each targeted segment or asset class. This score is then compared against program costs to produce a unitless RSE value that reflects the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics demonstrating how the Fuels Management program contributes to measurable risk reduction. Note that for methodological consistency and accuracy, units located outside the High Fire Threat District (HFTD)—but in close proximity to HFTD boundaries or within the Wildland Urban Interface (WUI)—were excluded from RSE calculations in this filing. For these locations, cross -boundary exposure and contextual factors can introduce modeling complexities that are not fully accommodated by the current RSE workbooks, making risk -reduction estimates less reliable. Accordingly, the table below reports RSE results only for units located within Tier 2 and Tier 3 HFTD areas, where the existing methodology most accurately reflects risk and benefits.

HFTD	2023 Actual Units (Targeted Fuels Reduction)	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	308	0.002	73.53	0.76%	29.26
Tier 2	206	0.001	24.67	0.45%	14.68
Non - HFTD / WUI	0	---	---	---	---

Consideration of Alternative Solutions:

1. No actions
- To take no action would not have supported the objectives set forth by the state of California for fuels management and the reduction of negative consequence that can result from fires on the landscape. Consequence mitigation and the use of fuels reduction is a widely used best practice in the transportation, utility, and other industries that have right of ways through wildland areas. The practice has even led to the creation of the Utility Fuels Management Working group that is led by OEIS and is focused on coordinating utility fuels management with other agencies like CALFIRE, USFS, Caltrans, and other organizations.
2. PSPS

While PSPS, may be used in these areas, the fuels management projects provided mitigation even when condition are not as extreme. These projects also protected some of the communities that have been impacted by PSPS with community projects that are in areas that have been subject to PSPS receiving increased consideration when making project decisions.
3. For Grants, different methodologies were considered when determining which projects to award funds. Using SMEs from the Greater Fire Safe Council and fire SMEs provide the most value.
4. For fuels reductions around poles, different distances were considered. SDG&E conducted a study using ignition information and pole locations. While the study was limited because of the data available at the time, there was indication that after 50ft, there was a drop in ignitions.
5. Notably, SDG&E's request to be more cost effective here by maintaining fuels management areas, as opposed to creating new projects, was denied by Energy Safety (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58911&shareable=true). SDG&E was thus under a regulatory requirement obligation to complete the work as performed.

Coordination with Similar Programs

SDG&E coordinated with local, state, and federal stakeholders in the areas of fuels management. The Greater Fire Safe Council also serves as a conduit to the various community groups within San Diego County. Pole based fuels management mirrors methods identified by CALFIRE for defensible space and the US Department of Transportation Federal Highway Administration for clear zones around on roadsides (for example a clear zone of 38- 46 feet is utilized on roadways with a 70 mph speed limit).

While similar programs existed in other utilities, coordination with groups who's goals align in the fuels management space is a specific target of some of the fuels management projects. For example, in working with the Campo Tribe near the US and Mexico border in east San Diego county, SDG&E performed a fuels management project. The tribe chose to perform an independent project that connected to a county road and to the SDG&E project. CALFIRE then performed another project so that all the projects connect and form an almost 2 mile long fuel break in an active fire area. (see image below)

Stakeholder Impact and Engagement:

Effective fuels management requires engagement from land owners, the utility, and agencies. For fuels management around poles, coordination with land and environmental agencies enabled the safe and environmentally responsible fire mitigation activities.

Related to Grants, working with tribal governments, fire safe councils, and local organizations enabled these grants to be awarded and the work to be executed. These grants also had the advantage of creating work in these areas and supporting the community fire prevention plans. Specifically SDG&E supported 3 tribes (through MOUs and funding), 18 fire safe council, and the Greater Fire Safe Council of San Diego County with this program in 2023.

ULCA program targeted groups like Urban Corp and the California Conservation Corps (CCC) as well as member of the public who had in interest in the field and the potential to seek employment within the utility vegetation management space.

Metrics:

Program	Cost	Poles	Acres	$/Pole
Targeted Fuels Reduction	$1,754,196	514	88.92	$3,413
UCLA Training	$627,891	NA		
Fuels Management Grants	$1,689,253	381	455	$4,434
Total	**$4,071,341**	**895**	**543.92**	**$3,847**

Area Cleared ratio of 50' fuels reduction compared to pole brush	24 x more area
Per pole Cost compared to Pole Brush	14.96 x more
Per pole Cost (grants) compared to Pole Brush	13.9 x more

(Pole brush had an average cost of $228.18 per pole)

Poles cleared 35,258 poles in accordance with PRC 4292 which requires a 10' radius of

Utility Benchmarking:

PG&E has a Wildfire Resilience Partnerships Team that began in 2023 and part of its mission is provide grants for mutually beneficial fuels management projects in the communities it serves. (Example of work performed: https://www.xyloplan.com/hubfs/WRP%20Newsletter%20July_20250711%20-%20external.pdf)

Pictures:

Before and After work was done with the Greater Fire Safe Council; the roadside clearing is also grant related work.

Campo Fuels Management Projects

Roadside brushing, highlighting the value added by widening corridors on egress routes

Connection point of SDG&E fuels management project, Campo Tribal fuels project, and CALFIRE fuels project. Each extending and increasing the effectiveness of the next. Accomplished through coordination and common mission

Fuels Reduction in an area along an SDG&E corridor in Tier 3 of the HFTD

Ignition and resulting 4'x4' fire in an area adjacent to a pole that without fuels management had the potential to have increased consequence

Workpaper	Vegetation Management and Inspections
Category	Pole Clearing (Brushing)
WMP Tracking ID	WMP.512

Description	**Pole Clearing (Brushing)**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	-
Capital Expenditures Non-Labor	-	-	-	-	-
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
Capital Expenditures Indirect Costs	-	-	-	-	-
Capital Total	**-**	**-**	**-**	**-**	**-**
O&M Labor	110	256	269	240	262
O&M Non-Labor	2,481	5,179	5,289	5,868	7,783
O&M Direct Costs Subtotal	**2,591**	**5,435**	**5,558**	**6,107**	**8,045**
O&M Indirect Costs	103	217	218	378	188
O&M Total	**2,694**	**5,652**	**5,776**	**6,485**	**8,233**
Units					
Poles	36,563	35,102	34,000	35,485	**35,258**
FTE*	1.3	3.0	3.1	2.7	**2.9**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					4,374

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Pole Clearing (Brushing)					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**2,591**	**5,435**	**5,558**	**6,107**	**8,045**
Labor	110	256	269	240	262
Non-Labor	2,481	5,179	5,289	5,868	7,783
Pole Clearing (Brushing) Total	**2,591**	**5,435**	**5,558**	**6,107**	**8,045**

Business Purpose:

Pole Brushing was a required mitigation per Public Resource Code (PRC) § 4292. The activity consisted of clearing, to mineral soil, a 10' radius around poles that had equipment identified in the California Powerline Equipment Identification Pocket Guide. The objective of this program was to prevent ignitions from heat sources that may exist at each pole location.

Project Justification:

While mandated to perform these tasks to prevent ignitions, this program was also justified through its primary objective of preventing ignitions on State Responsibility Areas (SRA). The project helps prevent ignitions and/or limit the negative impact of fires through preventing heat sources from coming into contact with flammable fuels by removing the fuels around potential heat sources. The number of poles and method used for performing this mitigation were dependent of the growth of the vegetation at the pole location and any other environmental, cultural, or external factors that may exist.

Project Scope:

Pole clearing is a fire prevention measure involving the removal of vegetation at the base of poles that carry specific types of electrical hardware, identified by the state to have a higher potential to cause sparking or molten material to fall to the ground. PRC § 4292 requires the removal of all vegetation down to bare mineral soil within a 10-foot radius from the outer circumference of subject poles located within the boundary of the state responsibility area (SRA), subject to certain exemptions. The program also met the requirements in PRC § 4293, which requires the removal of live vegetation up to 8 vertical feet and the removal of dead vegetation up to the conductor level within the clearance cylinder. While the majority of the SRA in SDG&E's service territory is within the High Fire Threat District (HFTD) there are poles that fall within the SRA and under the scope of PRC § 4292 that are in Non-HFTD areas.

Cost Drivers:

The primary cost drivers resulted from an increase in the unexpected volume of work ("spend driver") as well as compounding contractual, market, and regulatory conditions that directly increased the unit cost of performing the work ("cost driver"). Particularly, for Pole Brushing - the incremental amount requested was due to the increase in the volume of target poles that were not reflected in SDGE's 2019 General Rate Case (GRC) forecast (spend driver) along with the substantial cost driver through the implementation of Senate Bill (SB) 247 (cost driver), which increased the salaries that SDG&E had to pay to qualified contractors.SB 247 represented a significant and unanticipated cost driver that could not have been reflected in SDG&E's 2019 GRC forecast, as the associated labor cost increases were not present in historical data. As noted, SB 247 codified enhanced safety and compensation requirements in the utility vegetation management industry to align more closely with other electrical workers, reduce skilled-labor turnover, and strengthen wildfire prevention through improved vegetation management.

Through a comprehensive and competitive Request for Proposal (RFP), SDG&E established new long-term contracts for core vegetation management activities to align pricing with current regulatory, operational, and market conditions. Although competitive, the process resulted in higher unit and hourly rates due to expanded regulatory requirements, increased contractor risk, and a more rigorous qualification framework prioritizing safety, quality, General Order (GO) 195 compliance, reliability, and long-term value. Broader market conditions including post-pandemic inflation, higher fuel and equipment costs, and skilled labor shortages, also contributed to increased pricing (cost driver).

Other spend drivers that can drive impact costs are the growth rates of the vegetation, sensitive species findings, and utility infrastructure updates.

Project Timing and Phases:

Pole brushing activities followed a general timeline of inspection/identification, brushing/clearing, and then auditing of work performed. This timeline could shift from location to location as the overall objective is to maintain compliance with PRC 4292 at all times and mitigate risk. Bird nesting, vegetation growth cycles, and other environmental factors could impact this timeline but through coordination with internal groups, the public, and external agencies, clearance was maintained around subject poles.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy.

In collaboration with SDG&E's Supply Management department and in compliance with SDG&E's Procurement Policy, competitive sourcing activities were conducted to select qualified contractors to support the fuels management and vegetation management programs. These sourcing efforts included a comprehensive qualification process in which potential bidders were evaluated against established criteria such as safety performance, utility experience, past work performance, contractual rates, sustainability practices, resource availability, professionalism, and overall risk management.

Following this evaluation, long-term master agreements were negotiated and executed with selected contractors. These agreements established standardized terms, conditions, and pricing structures that enabled efficient engagement for fuels management services. When services were required, contractors were selected through a requisition process that identifies the specific program need and initiates the establishment of a program-specific agreement to support either fuels management program support or pole brushing services. As part of this process, proposed rates were reviewed for competitiveness and reasonableness in accordance with prevailing market conditions and bidder submittals creating alignment with industry standards and procurement best practices.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The Pole Clearing (WMP .512) had a target of 33,010 poles brushed in 2023. Planned O&M spend was $6,411,000 but SB247's passage significantly increased the actual O&M amount through higher wages.

Risk Identification and Mitigation:

PRC 4292 was designed to mitigate and reduce the risk of hot material falling into receptive fuels around the base of power poles. Utilities worked to maintain the prescribed clearances and to prevent such events from occurring by gathering information related to evidence of heat and ignition events that may occur on SDG&E equipment.

SDG&E's Pole Clearing (Brushing) program applies the Risk Spend Efficiency (RSE) framework, grounded in the Multi-Attribute Value Function (MAVF) methodology, to quantify how the program reduces wildfire, Public Safety Power Shutoff (PSPS), and operational risks. Using MAVF, the program evaluates safety, reliability, financial impacts, and ignition-risk reduction to develop a normalized risk-reduction score for each targeted segment or asset class. This score is then compared against program costs to produce a unitless RSE value that reflects the efficiency of risk mitigation per dollar invested.

The following table summarizes key program metrics demonstrating how the Pole Clearing (Brushing) program contributes to measurable risk reduction. Note that for methodological consistency and accuracy, units located outside the High Fire Threat District (HFTD)—but in close proximity to HFTD boundaries or within the Wildland Urban Interface (WUI)—were excluded from RSE calculations in this filing. For these locations, cross-boundary exposure and contextual factors can introduce modeling complexities that are not fully accommodated by the current RSE workbooks, making risk-reduction estimates less reliable. Accordingly, the table below reports RSE results only for units located within Tier 2 and Tier 3 HFTD areas, where the existing methodology most accurately reflects risk and benefits.

HFTD	2023 Actual Units	Ignitions Avoided	Risk Reduction	Risk Reduction (%)	RSE (per million)
Tier 3	15,754	0.029	276.28	2.85%	81.88
Tier 2	16,074	0.037	202.57	3.66%	58.84
Non - HFTD	3,430	---	---	---	---

Consideration of Alternative Solutions:

1. Do not perform activity. This activity is a PRC 4292 requirement, not doing this activity would have put SDG&E in non-compliance.
2. Reduce the scope of the project and target number of poles. But that would have also put SDG&E in non-compliance. SDG&E submitted a petition to Energy Safety to amend its seeking authority to reduce its WMP targets in 2025. That petition to amend was rejected.

Petition: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58234&shareable=true
Decision: https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=58911&shareable=true

Coordination with Similar Programs

SDG&E coordinated with state agencies and other utilities to meet the needs and requirements of PRC 4292. This mitigation was performed throughout the state and served to mitigate specific risk events. In an effort to avoid redundancies, SDG&E tracked poles and poles that have been pole brushed utilizing the same system it uses to track tree trim and inspection activity. This served to provide awareness of the work that has been performed at each location and enabled SDG&E to avoid double visiting a pole for the same activity.

Stakeholder Impact and Engagement:

SDG&E worked with local state representatives who were tasked with inspecting pole locations for compliance with PRC 4292 as part of their duties. Providing information related to the California Powerline Equipment Identification Pocket Guide also helped to promote efficiency during their visits. As this work is required, SDG&E also engaged with customers to share the reasons that this work is performed and the details of the mitigation.

Metrics:

The calculated average cost per pole was $228.18 in 2023.

Utility Benchmarking:

Poles brushing is driven by PRC 4292 & 4293 and was performed throughout California. Methods, enhancements, and opportunities had the ability to be shared through various working groups and joint utility relationships.

Pictures:

N/A

Workpaper	Vegetation Management and Inspections
Category	Tree Planting - Right Tree Right Place
WMP Tracking ID	WMP.1325

Description	**Tree Planting - Right Tree Right Place**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	-
Capital Expenditures Non-Labor	-	-	-	-	-
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
Capital Expenditures Indirect Costs	-	-	-	-	-
Capital Total	**-**	**-**	**-**	**-**	**-**
O&M Labor	-	-	9	34	67
O&M Non-Labor	-	-	384	839	1,152
O&M Direct Costs Subtotal	**-**	**-**	**393**	**873**	**1,218**
O&M Indirect Costs	-	-	2	51	38
O&M Total	**-**	**-**	**395**	**923**	**1,257**
Units					
Trees	-	-	16,844	14,041	**16,205**
FTE*	-	-	0.1	0.4	**0.7**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Tree Planting - Right Tree Right Place					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**-**	**-**	**53**	**237**	**456**
Labor	-	-	9	34	67
Non-Labor	-	-	44	203	390
Tree Planting - Right Tree Right Place Total	**-**	**-**	**53**	**237**	**456**
Removal Replacement Trees					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**-**	**-**	**340**	**635**	**762**
Labor	-	-	-	-	-
Non-Labor	-	-	340	635	762
Removal Replacement Trees Total	**-**	**-**	**340**	**635**	**762**
Total	**-**	**-**	**393**	**873**	**1,218**

Business Purpose:

While SDG&E maintained an extensive tree trimming program, the Right Tree Right Place and replacement programs proactively addressed potential vegetation caused ignition risks by incentivizing customers and in some cases municipalities to remove hazardous or incompatible trees near power lines and prevent future planting of incompatible species. The program also prioritized the replacement of higher risk trees with utility compatible species that are typically low growing and less likely to encroach on electric infrastructure. This approach enhanced customer awareness of wildfire risk factors and mitigation strategies while reducing vegetation related hazards, equipment contact, and the need for repeated corrective maintenance. In addition, the program served as an effective tool to facilitate customer cooperation and expedite the removal of hazardous trees, supporting long term wildfire risk reduction and sustainable vegetation management across SDG&E's service territory.

This program is provided for in SDG&E's WMP.

Project Justification:

The Right Tree Right Place Program was a proactive vegetation management activity designed to incentivize the removal and replacement of hazardous or incompatible trees with utility-compatible trees that are unlikely to encroach into powerlines over their lifecycle. This proactive approach complemented the traditional vegetation management program by reducing the probability of future vegetation-related ignitions, minimizing the need for repeated corrective work, streamlining the customer coordination process of abating hazardous trees targeted for removal.

Additionally, within the City of San Diego, a replacement tree was part of the removal process and through the provision of such a replacement tree that meets the needs of the community and does not require repeated corrective vegetation management work, cost savings may be achieved.

Project Scope:

The scope of this category includes Right Tree, Right Place (WMP 1325), the Community Tree Rebate Program (WMP 1326), and replacement trees that were removed in support of meeting state requirements (General Order 95) and/or Federal requirements (Protection and Control 4293). The overall objective is to reduce the likelihood of trees becoming future inventory trees that would pose a risk to the electric system and require additional mitigations. By supporting the planting of tree species that are not anticipated to grow above 25ft., and using these trees to incentivize the removal of hazard species, SDG&E is able to reduce future costs while still meeting the needs of our customers.

The Right Tree, Right place program strives to have utility friendly species of trees utilized as opposed to other species like Eucalyptus that have a higher likely of becoming hazards.
The community rebate program (https://www.sdge.com/sites/default/files/documents/Community%20Tree%20Rebate%20Program%20Eligibility%20List%202023.pdf) incentivizes qualifying residential customers by providing reimbursement for the purchase of utility friendly plants and trees.

Cost Drivers:

For the period referenced the primary drivers were largely driven by the number of units (trees) that were purchased as part of the program as well as the customer rebates processed in support of Community Tree Rebate Program. These spend drivers affected the volume of work conducted and the subsequent activities of purchasing and distributing utility-compatible trees, administering customer rebates, and covering associated expenses for the provision and coordination activities. Additional cost drivers associated with this category included customer outreach and education, coordination with customers and municipalities, and program administration with total expenses scaling based on participation levels and annual tree distribution targets.

Furthermore, to manage and contain these cost drivers, the Company leveraged multiple nurseries and established contracts to secure market-based pricing for procured trees, using existing rate structures and vendor agreements to control unit costs.

Project Timing and Phases:

Tree planting initiatives were aligned with San Diego's typical planting season to assist with their long term success.

For tree removal incentive units, inspection followed a schedule, but determination of a potential removal target occurred throughout the year. Trees that were targeted for removal are typically trees that would have required heavy annual pruning, were unable to be pruned to meet required clearances, are dead/dying with strike potential, and in general are a risk to utility equipment. By providing a replacement, SDG&E mitigated the current risk by removing a tree with potential challenges, prevented future risks by having a utility safe species replace the existing tree, and saved customers the future costs of pruning a new or existing tree.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy.

In support of the Right Tree Right Place Program, contractors supporting the fuels and vegetation management programs were selected based on their qualified experience within the service territory, including demonstrated experience working with customers and municipalities. Contractor selection was conducted in collaboration with SDG&E's Supply Management department and in accordance with the Company's Procurement Policy through competitive sourcing activities.

These sourcing efforts included a comprehensive qualification process in which bidders were evaluated against established criteria such as safety performance, utility experience, past performance, contractual rates, sustainability practices, resource availability, professionalism, and overall risk management. Following this evaluation, long-term master agreements were negotiated and executed to establish standardized terms, conditions, and pricing structures that support efficient engagement.

When services were required, contractors were engaged through a requisition process that identifies the specific program need and initiates a program-specific agreement for fuels management program support or pole brushing services. As part of this process, proposed rates were reviewed for competitiveness and reasonableness based on prevailing market conditions and bidder submittals to support alignment with industry standards and procurement best practices.

The Supply Management department was responsible for formalizing agreements, either by negotiating rates or applying established long-term rates, and for defining program parameters used to monitor compliance and performance. Each agreement undergoes an internal approval process to confirm that all contractual elements—including scope of work, rates, terms and conditions, and performance expectations—are appropriately reviewed and approved prior to execution.

Additionally, for tree procurement, Supply Management had established long-term standard service agreements with nurseries throughout the service territory. These agreements evaluated supplier capability to provide utility-compatible trees and enable rates to remain competitive. The use of long-term agreements also enabled the negotiation of rate adjustment provisions to reduce risk, align with documented cost drivers, and provide cost predictability.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.2 and 8.2.3.6. Through a service territory-wide lens, having fewer trees with the potential to contact utility equipment has a net benefit to customers and the utility (less outages, less cost to maintain, less risk of ignition). By providing trees SDG&E created an incentive to accomplish this task while also supporting the communities we serve. There was no specific unit target in the WMP. Planned O&M spend was $1,000,000.

Risk Identification and Mitigation:

The tree planting initiative mitigated the risks associated with existing target trees by providing incentives for their removal and enable communities to plant the right kind of trees to support their sustainability objectives. While no Risk Spending Efficiency score was calculated to emphasize the risk reduction, the value of this program is to target the prevention of future risks and remove current risks from the SDG&E Right of Ways (ROWs).

Consideration of Alternative Solutions:

1. Do nothing
   - By not offering to replace trees when performing tree removals, SDG&E would not create an incentive to remove potentially hazardous and costly trees. This would negate future cost savings and risk reduction they create. Furthermore, by not incentivizing customers through this tool, the resolutions of customer refusals in securing tree removals would have most likely increased.
2. Removing trees utilizing other means.
   - SDG&E has the responsibility to maintain its ROW and is able to use tools like certified legal letters to obtain access and remove a tree. This process was typically more costly and less customer friendly than offering a replacement tree.

In 2023 the average cost of per tree was $75, the average cost of unit tree trim was $138.61, the average cost of a removal was $366.17 (Cat 1-3) or $1,080.52 (Cat 4 &5 larger trees). The cost to maintain a tree only goes up with the need for off cycle trims and does not include other costs or the risk created by each tree. Each tree that SDG&E avoids adding to the inventory saves customers at least $138.61 every year, creating an immediate and ongoing O&M reduction. When a tree replacement incentive is used to support removal ($366+$75 = $441), the avoided annual expense results in the investment paying for itself in three years or less, after which the savings continue to accrue year over year.

Coordination with Similar Programs

N/A

Stakeholder Impact and Engagement:

SDG&E coordinated with local, state, and federal stakeholders in the areas of tree replacement. Many of the cities in the service territory required a replacement tree to be provided when removals were permitted.

Metrics:

In 2023, a total of 16,205 trees were planted as part of these programs. This total is broken out into trees utilized as part of the sustainable Tree program (14,885), tree replacement during removals (1,274), and trees purchased as part of community relations opportunities (46). The average cost per tree was approximately $75.

- In 2023 the average cost of a unit tree trim was $138.61 and the average cost of a removal was $366.17 (Cat 1-3) and $1,080.52 (Cat 4 &5 larger trees). The cost to maintain a tree only goes up with the need for off cycle trims and does not include other costs or the risk created by each tree. This means that every tree that SDG&E avoids becoming an inventory tree saves customers, at minimum $138.61 annually and that if a tree replacement is utilized to provide incentive for a removal ($366+$75= $441) there is likely a net benefit to the overall budget in 3 years or less.

- 57 cities/tribes/land manager organizations received trees in 2023.

Utility Benchmarking:

- PG&E's Right Tree Right Place: Upon review of PG&E's 2023-2025 WMP, Energy Safety recommended that PG&E consider creating a "right tree-right place" program, offering tree replacements at no cost to customers which may reduce customer refusal constraints.
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M500/K017/500017327.pdf
https://www.pge.com/assets/pge/docs/outages-and-safety/outage-preparedness-and-support/pge-wmp-r6-07052024.pdf

- SCE's Right Tree, Right Place: SCE follows best utility practices when it trims trees for public safety. In cases where a tree is growing directly under a power line and when there is no pruning alternative, SCE will top the tree to create a safety zone between the tree and the power lines. In these cases, SCE recommends the tree be removed, which is done at no cost to the customer. SCE also recommends the customer carefully select any replacement trees from its “Right Tree, Right Place” brochure.
https://energized.edison.com/stories/sce-steps-up-tree-trimming-in-high-fire-risk-areas

- Liberty Utility's Community Canopy Program / Right Tree, Right Place Program: provides replacement vegetation to promote compatible plant communities adjacent to power lines with its Community Canopy Program. The Community Canopy Program provides replacement vegetation in response to tree mortality, Liberty’s routine vegetation management work, and as an incentive to promote “right tree, right place” principles to homeowners. Liberty advocates planting vegetation that is sustainable, fire-resilient, and compatible with the use of the land as an electrical infrastructure right-of-way. A well-planned yard contains vegetation that grows well in the soil and moisture of your neighborhood and is placed properly to avoid growing into power lines.
https://california.libertyutilities.com/uploads/Tree%20Safety%20and%20Vegetation%20Management%20FAQs%20Update%202023_final%20web.pdf

Utility	Documented Tree-Planting Commitment / Goal	Reasoning / Purpose	Regulatory or Programmatic Drivers
Duke Energy	Donates **tens of thousands of trees** to customers in recent years; plants a tree for customers subscribing to Renewable Advantage. [energydigital.com], [investors....energy.com], [news.duke-energy.com]	Improve grid reliability, reduce outages by strategic planting, enhance energy conservation, support environmental benefits. [energydigital.com]	No explicit regulator-mandated planting goal, but participates in tree-placement programs like One Tree Planted; activities support reliability obligations.
Entergy	Has delivered **thousands of free trees** via Arbor Day Energy-Saving Trees program (2,700 since 2018). Also funds tree-planting grants (e.g., 50 trees in Baton Rouge project). [entergy.com], [entergy.com]	Customer energy savings, improved community aesthetics, carbon reduction, habitat improvement. [entergy.com]	Not a mandated planting target; but activities support vegetation-management compliance and community stewardship expectations.
AEP (American Electric Power)	No formal planting goals located; provides extensive guidelines for customer planting near lines. Focus is on vegetation management, not planting. [aepohio.com]	Reduce outages; prevent vegetation conflicts with power lines. [aeptransmission.com]	Driven primarily by safety and reliability regulations around vegetation clearance, not tree-planting mandates.
SMUD (Sacramento Municipal Utility District)	~630,000+ shade trees planted since 1990; program continues offering up to 10 free trees per customer. [smud.org]	Heat-island reduction, energy savings, air-quality improvements, carbon storage. [smud.org]	Not regulatory, but SMUD has climate and urban-forest goals aligned with community environmental priorities.
SRP (Salt River Project)	Replants aggressively: removes problematic trees and plants **3–6x more** in many cities; e.g., 200+ new trees in Phoenix (2024) and 4,000+ planted since 2018. [abc15.com], [publicpower.org]	Improve reliability (remove hazard trees), expand urban canopy, reduce heat-island effects, support sustainability outcomes. [publicpower.org]	Driven by vegetation-management safety requirements and SRP’s broader **2035 sustainability goals**, but no tree-planting mandate.

Workpaper	Situational Awareness and Forecasting
Category	Weather Stations and NDVI Cameras
WMP Tracking ID	WMP.447

Description	**Weather Stations and NDVI Cameras**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	69	239	14	21	5
Capital Expenditures Non-Labor	495	801	385	189	2
Capital Expenditures Direct Costs Subtotal	**564**	**1,040**	**399**	**210**	**6**
Capital Expenditures Indirect Costs	68	408	63	39	6
Capital Total	**632**	**1,448**	**462**	**249**	**13**
O&M Labor	453	869	872	1,033	1,450
O&M Non-Labor	1,008	2,545	1,967	2,652	3,009
O&M Direct Costs Subtotal	**1,461**	**3,414**	**2,839**	**3,685**	**4,459**
O&M Indirect Costs	370	664	594	881	611
O&M Total	**1,832**	**4,078**	**3,432**	**4,566**	**5,070**
Units					
	The variety of work activities in this category makes it infeasible to identify a single unit of measurement.				
FTE*	4.3	8.9	7.0	8.2	**10.9**
Imputed Authorized Direct Capital $					583
Imputed Authorized Direct O&M $					2,395

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Fire Science and Climate Adaptation Dept					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**1,461**	**3,414**	**2,839**	**3,685**	**4,459**
Labor	453	869	872	1,033	1,450
Non-Labor	1,008	2,545	1,967	2,652	3,009
Fire Science and Climate Adaptation Dept Total	**1,461**	**3,414**	**2,839**	**3,685**	**4,459**
Meteorology - SDGE Weather Network					
Capital	**564**	**1,040**	**399**	**210**	**6**
Labor	69	239	14	21	5
Non-Labor	495	801	385	189	2
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Meteorology - SDGE Weather Network Total	**564**	**1,040**	**399**	**210**	**6**
Total	**2,026**	**4,454**	**3,238**	**3,895**	**4,465**

Business Purpose:

The SDG&E weather station network, comprised of 222 weather stations in 2023, increased situational awareness and generated foundational data for operational and mission critical activities. Weather stations in the network recorded wind speed, wind direction, wind gusts, temperature, and humidity every 10 minutes and transmitted the data to publicly available websites. Additionally, 95% of the weather stations had the ability to report every 30 seconds on an as-needed basis during fire weather conditions. Weather events have the potential to cause damage to electrical infrastructure, which may lead to faults or ignitions within the service territory. SDG&E determined that understanding the precise location and severity of weather events that could impact SDG&E's system was critical for planning and scoping grid hardening activities and responding to real-time events that may lead to Public Safety Power Shutoff (PSPS) events.

The collection of 30,000 daily observations from the weather network over the course of more than 10 years enabled statistical analysis that informed decision-making thresholds during PSPS events, while also being used to update relevant wind impact guidance. This data was supplemented by observations of grass greenness and satellite smoke detection to provide a more complete picture of the wildfire environment and any active fire activity within the SDG&E service territory.

Project Justification:

Situational awareness is key to understanding the wildfire environment. Whether through modeled forecasts or direct observations, the need to understand current and projected changes to the wildfire environment was paramount to being able to operate in a safe manner without utility infrastructure becoming the ignition source for catastrophic wildfires. This project was comprised of multiple facets that allowed for full situational awareness, including the onboarding of two new employees in the Fire Science and Climate Adaptation department to support company operations, the SDG&E weather station network that allowed for real-time measurements of atmospheric variables influencing the electric grid, wildfire modeling efforts that fed into risk modeling software, weather forecast models that identified potential fire weather events to come, and statistical analyses that were critical for generating the scope for potential fire weather events.

Project Scope:

The scope related to this initiative was multifaceted and included overall support and expansion of the Fire Science and Climate Adaptation department, weather and risk modeling, and maintaining situational awareness.

The Fire Science and Climate Adaptation department is comprised of meteorologists, fire coordinators, and climate adaptation specialists. One meteorologist and one fire coordinator were needed to fill the roles of employees that departed the company. As this team is responsible for the daily forecasting, training and communication with first responders during wildfire incidents, and provided operational support during times of high fire danger and/or Public Safety Power Shutoff events, they were necessary for communicating day-to-day situational awareness of the wildfire environment to the utility and acting as a liaison between SDG&E and the broader community. Additionally, this team provided specialized expertise in building and maintaining weather forecast models and wildfire risk models that had become imperative to utility operations.

Situational awareness of the atmosphere and landscape was paramount to identifying significant fire weather concerns. Preventative maintenance of the SDG&E weather network was needed at a handful of sites to replace aging parts and maintain reliable service, while service agreements needed to be maintained to continue receiving notifications for satellite detections of wildfire smoke and to maintain access to local mountaintop cameras.

Cost Drivers:

Costs incurred for this initiative in 2023 were related to expansion and support of SDG&E's Fire Science and Climate Adaptation department, maintaining situational awareness, and supporting weather and risk modeling efforts. Labor charges, in addition to annual subscription fees for wildfire modeling software, represented the majority of O&M costs for this initiative. The wildfire modeling software ingested real-time weather station observations, modeled weather data and electric system assets and generated millions of wildfire simulations through a defined forecast period to highlight areas at highest risk of wildfire impacts and the potential associated financial impacts. Other related costs included data storage and sharing fees for weather model data so it could easily be incorporated into various visualization and analysis platforms, and ongoing vendor support for reliability of the weather forecast model data.

Additionally, the SDG&E weather network underwent a series of upgrades, with 30 charging regulators added, 6 battery/solar upgrades, 5 total modem upgrades to support data transmission, 3 new dead fuel moisture sensors installed. Additionally, one new Normalized Difference Vegetation Index (NDVI) camera was installed, which allowed for monitoring of grass greenness in support of the SDG&E Fire Potential Index. Other situational awareness costs were related to notifications for satellite detection of wildfire smoke, and ongoing support for regional mountaintop cameras that allowed for a birds-eye view to identify any potential smoke or wildfire impacts across the SDG&E service territory.

Project Timing and Phases:

Support for the Fire Science and Climate Adaptation department and weather and risk modeling was ongoing through the year. Interviews for the fire coordination and meteorology positions began in Q1 2023, with both positions filled in April 2023. One additional weather model was operationalized in summer 2023, which resulted in higher resolution data available to support critical operations.

Goals for weather station upgrades were identified in Q4 2022, with replacements made gradually through 2023.

Approval Process/Procurement Process:

SDG&E used existing agreements with external vendors that had the required skills and expertise to perform the task and maintenance as required.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.3.2.1.1, 8.3.2.3.1 and 8.3.2.4.1. This program does not have specified targets.

Risk Identification and Mitigation:

A major risk addressed by this program is associated with not upgrading equipment on the weather station network resulting in communication failures and unreliable data streams during critical weather periods.

Consideration of Alternative Solutions:

1. Do nothing: Not upgrading equipment on the weather station network may have resulted in communication failures and unreliable data streams during critical weather periods. This could lead to decreased situational awareness and limit accuracy on PSPS decisions.

2. Rely on pre-existing weather stations: Reliable and well-maintained weather station networks were owned and operated by the United States Forest Service, the Federal Aviation Administration, and the National Weather Service. However, these weather stations were largely focused near urban locations in support of local airports and to address public health concerns with heat and cold, or were in mountainous locations with easy access to roads. As a result, the complexities in microclimates that result from the terrain within our High Fire Threat District (HFTD) were largely undetected. Further, the weather stations located within the HFTD primarily reported once per hour, which would not meet the granularity requirements of the utility when fire weather concerns were high.

3. Use publicly available wildfire risk models: Most wildfire risk software was proprietary in 2023. While there were limited resources for publicly available wildfire risk model software at the time, their models were not as comprehensive as the proprietary versions and may not have fully characterized the risk associated with potential wildfire events.

4. Rely on government-run high resolution weather models: The United States government does run high resolution weather forecast models that are made publicly available and can be ingested into data visualization platforms. However, these models have not been optimized for handling the complex terrain across Southern California, nor have they been calibrated for the high-impact Santa Ana conditions that occur. Further, these models only provide forecasts out 48 hours in time, which would not meet the regulatory requirements of beginning notifications to potentially impacted PSPS public safety partners 72 hours in advance of a potential event.

Coordination with Similar Programs

N/A

Stakeholder Impact and Engagement:

Weather station data was made publicly available from the initialization of the weather network program. As such, new weather stations were seamlessly added into data streams that feed stakeholder websites, including the National Weather Service observations page, without need for stakeholder engagement. Public education also took place at annual Wildfire Safety Fairs throughout the SDG&E service territory, where customers and community members could discuss their nearest representative weather station with members of the Fire Science & Climate Adaptation team and find ways to monitor the data as weather events occurred. Similarly, regular education on the programs listed here were accomplished through tours of the Wildfire and Climate Resiliency Center, where key programs supporting situational awareness and wildfire mitigation were presented to community stakeholders, including local and state politicians, investors, first responders, and school groups to highlight regional wildfire safety.

Metrics:

N/A

Utility Benchmarking:

SDG&E regularly benchmarks with other utilities in their use of weather stations and support from meteorologists and fire experts. As such, utility weather station networks across California are relatively uniform in the measurements they provide and abilities to inform overall situational awareness.

Pictures:

N/A

Workpaper	Situational Awareness and Forecasting
Category	Air Quality Management Program
WMP Tracking ID	WMP.970

Description	**Air Quality Management Program**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	56	34
Capital Expenditures Non-Labor	-	-	-	275	48
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**331**	**82**
Capital Expenditures Indirect Costs	-	-	-	55	19
Capital Total	**-**	**-**	**-**	**387**	**101**
O&M Labor	-	-	-	3	2
O&M Non-Labor	-	-	-	0	64
O&M Direct Costs Subtotal	**-**	**-**	**-**	**3**	**66**
O&M Indirect Costs	-	-	-	1	1
O&M Total	**-**	**-**	**-**	**4**	**67**
Units					
Sensors	-	-	-	9	**7**
FTE*	-	-	-	0.5	**0.3**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
AQI Notifications (WMP)					
Capital	**-**	**-**	**-**	**331**	**82**
Labor	-	-	-	56	34
Non-Labor	-	-	-	275	48
O&M	**-**	**-**	**-**	**3**	**66**
Labor	-	-	-	3	2
Non-Labor	-	-	-	0	64
AQI Notifications (WMP) Total	**-**	**-**	**-**	**335**	**148**

Business Purpose:

Particulates contained in wildfire smoke can be hazardous to employees and the public. The California Division of Occupational Safety and Health (Cal/OSHA) Title 8 Section 5141.1 requires employers to notify employees and implement control measures when the Air Quality Index (AQI) for Particulate Matter 2.5 microns or smaller in diameter (PM2.5) exceeds 150 or exceeds 500 during wildfires. SDG&E's AQI program included obtaining AQI measurements from particulate sensors and communicating the AQI and protective measures to employees to meet these requirement. Particulate sensors measured the levels of PM2.5 and when defined thresholds were exceeded, the SDG&E Safety department was notified. If the particulate source was confirmed to be a wildfire, notifications with AQI information were sent to supervisors via text and email.

Project Justification:

SDG&E is required by law to determine the employee's exposure to PM2.5 at the start of each shift and periodically thereafter and implement a system for communicating the current AQI for PM2.5 to employees and protective measures available to reduce their wildfire smoke exposures. While data from sensors measuring particulate matter is publicly available through other sources, sensors were primarily focused in urban locations with few measurements across wildland areas where the risk of wildfire is highest. The AQI program aimed to install sensors at all SDG&E district yards and company facilities in sparsely populated areas to provide real-time AQI values for an increasing number of areas above what has been historically been provided by San Diego County and the Environmental Protection Agency and to support compliance with state requirements.

Project Scope:

In 2023, SDG&E selected seven sites to install AQI sensors, complementing the nine sensors deployed as the program began in 2022. Sites selected included SDG&E field offices and substations in locations prone to impacts from wildfire smoke with zonal representation across northern, central, and southern portions of the SDG&E service territory. Each site was equipped with communications equipment that allowed for automated tracking of PM2.5 levels and informed a notifications tree once particulate matter levels reached defined dangerous thresholds.

Cost Drivers:

Capital: While the Air Quality Management program formally began in 2022, the sensor network was expanded in 2023 to include an additional seven sensors, located at field offices and substations. The nonlabor costs were primarily comprised of the cost for sensors, mounting hardware, electrical wiring, data gathering / storage, and data transmission, while labor costs included installation of the sensors and IT support for data integration and the notification system. Because elevated PM2.5 levels can result from non-wildfire sources - such as vehicle exhaust, power generation or fuel combustion - the data integration effort added a verification step in which the SDG&E Safety department is automatically notified to confirm whether the particulate source is a wildfire before notifications are sent to supervisors via text and email.

O&M: To achieve accurate measurements, regular maintenance of all 16 AQI sensor sites was needed. Recommended field maintenance included monthly visits to clean select components of the sensors and perform flow audits and calibration, quarterly visits to disassemble and fully clean all components of the sensors, and annual visits to replace the sensors' pumps and purge filters.

Project Timing and Phases:

2021: Following filing of the permanent, finalized version of Cal/OSHA Title 8 Section 5141.1 in February 2021, preliminary research began to determine the feasibility of expanding the SDG&E weather station network to include AQI sensors. Vendor support was sought out to understand the type of sensors needed, and initial scoping to determine preliminary sensor site locations was performed.

2022: Maintenance support crews were trained in installing and calibrating the sensors, and the installation work began. A total of nine sensors were installed between March 1 and October 31, with monthly and quarterly maintenance performed on each as required.

2023: Seven additional sensors were installed between January and November, and all sites, including the nine installed in 2022, were visited on a monthly basis for required maintenance.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. SDG&E used existing agreements with a vendor that demonstrated expertise in the technologies needed to create the AQI sensor program, who was uniquely qualified and positioned to provide monthly maintenance.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The Air Quality Management Program (WMP .970) installed 7 sensors of the 6 sensors specified in SDG&E's approved WMP annual target. Planned Capital spending was $58,000, and planned O&M spending was $28,000.

Risk Identification and Mitigation:

This program addresses the risk of not notifying employees when the AQI for Particulate Matter 2.5 microns or smaller in diameter (PM2.5) exceeds 150 or exceeds 500 during wildfires, which is required in Cal/OSHA Title 8 Section 5141.1.

Consideration of Alternative Solutions:

Do Nothing: Taking no action to monitor AQI data would put SDG&E in violation of Cal/OSHA Title 8 Section 5141.1.

Use Publicly Available Data: Limiting data to publicly available sources may have resulted in insufficient data across wildland areas where the risk of wildfire is greatest. According to https://map.purpleair.com/, sensors are primarily installed across urban areas that lack a substantial wildfire risk, but have higher levels of unhealthy air due to urbanization and pollution. However, utility workers in more sparsely populated areas would be less likely to have an AQI sensor nearby to quantify the PM2.5 levels near their work site. Public data also introduces a host of risks that stem from a lack of regulation on sensor calibrations. Not knowing how often or how well a data site is maintained may result in inaccurate data points informing decisions that put field employees at risk of health impacts from underreported PM2.5 values.

Coordination with Similar Programs

Public data sources for air quality information were leveraged to identify gaps in data availability across the region.

Stakeholder Impact and Engagement:

All data from SDG&E AQI sensors was made publicly available through the SDGE Weather mobile application.

Metrics:

N/A

Utility Benchmarking:

Prior to the development of the AQI program, SDG&E benchmarked with several other utilities. One utility had recently deployed Purple Air sensors in their service territory. However, Purple Air sensors did not meet SDG&E's Cybersecurity requirements. SDG&E selected robust particulate sensors that were already in use at a Port in Southern California.

Pictures:

N/A

Workpaper	Situational Awareness and Forecasting
Category	Fire Potential Index
WMP Tracking ID	WMP.450

Description	**Fire Potential Index**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	6	16
Capital Expenditures Non-Labor	270	1,191	1,446	1,627	1,314
Capital Expenditures Direct Costs Subtotal	**270**	**1,191**	**1,446**	**1,632**	**1,330**
Capital Expenditures Indirect Costs	6	32	23	5	24
Capital Total	**277**	**1,223**	**1,469**	**1,638**	**1,354**
O&M Labor	-	-	-	-	-
O&M Non-Labor	-	-	-	-	-
O&M Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
O&M Indirect Costs	-	-	-	-	-
O&M Total	**-**	**-**	**-**	**-**	**-**
Units					
	The variety of work activities in this category makes it infeasible to identify a single unit of measurement.				
FTE*	-	-	-	0.1	**0.2**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Fire Science Enhancement					
Capital	**270**	**1,191**	**1,446**	**1,632**	**1,330**
Labor	-	-	-	6	16
Non-Labor	270	1,191	1,446	1,627	1,314
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Fire Science Enhancement Total	**270**	**1,191**	**1,446**	**1,632**	**1,330**

Business Purpose:

The Fire Potential Index (FPI) was developed by SDG&E to communicate the wildfire potential on any given day to promote safe and reliable operations. This 7-day forecast product, which is produced daily, classifies the fire potential based on weather and fuel conditions paired with historical fire occurrences. High FPI ratings, defined as Elevated or Extreme, are associated with an increase in the probability of large wildfires. While the FPI does not provide direct risk reduction, it does provide situational awareness that dictates operational procedures and protocols.

Additional situational awareness tools were needed to diagnose the potential for wildfire growth and the consequences of ignitions. This led to partnerships with various vendors to create products that would complement the FPI, including the ensemble-based Santa Ana Index that captured the probability and severity of Santa Ana wind events, live fuel moisture content models that could better assess fire danger using high-resolution satellite data, and data repositories that allowed for querying and archiving of weather models while producing visualizations that assisted in diagnosing the potential for critical fire weather conditions.

Project Justification:

Following catastrophic wildfire events in the late 2010s and early 2020s, the scientific research community recognized the need for increased understanding of wildfires and the environmental conditions that contribute to their growth. While there was a wealth of information being discovered through these research efforts, tying this knowledge into operational products that could inform SDG&E decision-making prior to and during extreme fire weather conditions were lacking. This led to partnerships to develop the Santa Ana Index, enhance live fuel moisture modeling, and promote ease of data hosting and sharing.

Santa Ana Index: The Santa Ana Index enhanced the information provided through the SAWTI by introducing a probabilistic forecast, leveraging a 200-member ensemble of weather models to diagnose the range of possibility for the timing of Santa Ana wind development and the overall event strength. Determination of these factors allowed for increased confidence in diagnosing the potential need for PSPS activations and the broad timeframes for event initiation and conclusion, while also acting as a source of communication to highlight any uncertainties that may be inherent in the forecast.

Live Fuel Moisture Model: Live fuel moistures are a key component of SDG&E's FPI, yet one of the least sampled variables within the SDG&E service territory. In 2023, regular observations from only two mountain sites were made available by the US Forest Service, leading to uncertainty in whether these values accurately characterized live fuel moistures across the diverse ecosystems of San Diego and southern Orange Counties. Endeavoring on a gridded live fuel moisture model would produce a more accurate picture of the health of the vegetation territory-wide, resulting in a more representative characterization of the daily fire potential for all of SDG&E's operating districts.

Data Hosting and Sharing: A wealth of weather data was produced by SDG&E, with twice-daily weather forecast model runs across five ensemble members that required visualization for subject matter experts to be able to diagnose potential fire weather conditions. Further, model ingestion into key tools such as the FPI and wildfire risk modeling was imperative to providing situational awareness into the daily risk of wildfire. As such, data hosting platforms were needed to visualize the model data and easily integrate key variables into decision-making processes.

Project Scope:

The scope related to FPI was multifaceted and included: adjusted data points and calculations in the experimental Santa Ana Index product, operationalization of a machine learning live fuel moisture model, and data hosting and sharing.

Santa Ana Index: The Santa Ana Index is an operational tool that uses a 200-member weather model ensemble at 9-kilometer grid spacing to combine wind speed, temperature advection, and surface pressure gradients to create a probability forecast of Santa Ana event strength, ranging from weak to strong. This project was in an experimental phase in 2023 and still undergoing adjustments to refine its capabilities. The overall scope of changes in 2023 included the addition of new transects that would allow for improved calculation of Santa Ana winds from varying directions (i.e. those that occur from the northeast versus north-northeast) and a change in the scale of the product to allow for stronger wind events.

Live Fuel Moisture Model: Live fuel moistures, or the amount of moisture within the living parts of chamise plants, is a key component of SDG&E's FPI. As part of a previous phase of research, a learning dataset of live fuel moistures was created and used to train a machine learning live fuel moisture model that was then validated against observational data. This scope aimed to advance the previous phase of research, creating a live fuel moisture model based on historical satellite and weather data that could be operationalized into near-real-time products in an automated workflow that consistently retrains the machine learning model to produce an accurate, gridded live fuel moisture model that would fill in the gaps left by sporadic observations of live fuel moistures within the SDG&E service territory.

Data Hosting and Sharing: SDG&E weather datasets, including forecast model runs, FPI information, and historical datasets, were made publicly available with daily archiving and Application Programming Interfaces (APIs) for querying. Data storage and cloud backup were enlisted, facilitating the use of these datasets in fire modeling and further product developments within the scientific research community.

Cost Drivers:

Costs incurred for all pieces of this initiative were related to third-party vendor support contracts that improved SDG&E's situational awareness capabilities and directly supported the technologies mentioned in the Business Justification and Project Scope sections.

Project Timing and Phases:

Santa Ana Index: The development phase of the Santa Ana Index began during the summer of 2022. An initial prototype was operationalized in late September 2022, but required further refinement. Upon analysis during the early Santa Ana wind season in October through December 2022, areas for potential improvement were identified. These were scoped out with the existing vendor, and changes were implemented prior to the Santa Ana wind season in 2023 for further verification and validation.

Live Fuel Moisture Model: The initial phase of model development in early 2023 revolved around data acquisition from 2014-2022. Data sources included Landscape Fire and Resource Management Planning (LANDFIRE) static data (describes vegetation, wildland fuel, and fire regimes across the United States), Landsat and Sentinel satellite data, high resolution gridded weather data, and live fuel moistures. Once data were acquired, a gridded design was created across the state of California for model implementation, and model development began. By the end of 2023, a random forest regressor model was being trained based on approximately 25,000 live fuel moisture samples across 300 sites within California. The model was built across roughly 450 million prediction pixels and generated bi-weekly predictions of live fuel moistures for the eight-year training period.

Data Hosting and Sharing: Data sharing platforms were initially created in 2020. These were expanded upon in June 2023 to include virtual machine services to accommodate staging and production of sdgeweather.com, which is leveraged as a communication platform for SDG&E meteorologists to communicate forecast impacts both internally and externally. Additional weather models were also operationalized by SDG&E in Q3 2023 and added to the data sharing platforms, both for storage of raw files and for forecast visualization purposes to support daily operations.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. SDG&E used existing agreements with vendors in academia that had the required skills and expertise to perform the tasks. SDG&E subject matter expertise was used to shape the details of each initiative to be able to incorporate them into utility operations and to define the datasets integrated into the data storage platforms.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.3.6. This program does not have specified targets.

Risk Identification and Mitigation:

The risk this program addressed is around incorrectly forecasting a weak versus moderate Santa Ana wind event leading to an incorrect decision of whether or not to activate for PSPS events, which could lead to a widespread wildfire or mitigating a non-threat.

Consideration of Alternative Solutions:

1. Do not enhance the Santa Ana Index: The ability to identify the range of possibilities in Santa Ana wind forecasting is paramount to creating accurate forecasts. Visibility into the likelihood of weak versus moderate Santa Ana wind events can inform the decision of whether or not to activate for Public Safety Power Shutoff (PSPS) events, which might not be possible when strictly assessing the limited number of deterministic weather forecast models available. Further, the probabilistic forecasts allow for better transparency around the uncertainty in wind speeds and can allow for decisions to be made on risk rather than absolutes.

2. Rely on publicly available ensemble data: Most weather forecast ensembles are presented through model averages and do not fully reflect the range of possibilities reflected across the individual ensemble members.

3. Do not operationalize a live fuel moisture model: The live fuel moisture model allows for a gridded representation of a key component of the FPI across the SDG&E service territory. Without this gridded approach, the FPI algorithm would be dependent on observations from two point locations within San Diego County that do not necessarily represent conditions region-wide, leading to inaccuracies in the output rating of the FPI and, potentially, an increase in utility-related ignitions.

4. Increase the number of live fuel moisture sampling points: Relying on observational data as opposed to modeled live fuel moisture may result in more accurate data. However, costs to support a live fuel moisture observation program with the number of samples needed to accurately portray the live fuel moistures needed to calculate the FPI would have been high, requiring travel costs, fuel moisture ovens, and substantial time allocation to sample a number of sites on a bi-weekly basis.

5. Do not make data publicly available: If the weather data were not made publicly available, transparency in the data sources being used to make high-impact decisions would have been lost and integration of data into internal and external datasets would have become more challenging.

Coordination with Similar Programs

N/A

Stakeholder Impact and Engagement:

The Santa Ana Index became a reference product for the National Weather Service (NWS) office in San Diego, and was regularly used to enhance their communication to regional public safety partners in advance of Santa Ana wind events. SDG&E maintained communication with the Warning Coordination Meteorologist at the NWS San Diego office to discuss the tool and, on occasion, its forecast outputs.

Metrics:

N/A

Utility Benchmarking:

Both SDG&E and PG&E explored the operational live fuel moisture model through involvement in the Wildfire Interdisciplinary Research Center. Through this center, both utilities were able to directly support and guide the development of the model.

Pictures:

N/A

Workpaper	Situational Awareness and Forecasting
Category	High-Performance Computing Infrastructure
WMP Tracking ID	WMP.541

Description	**High-Performance Computing Infrastructure**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	9	0
Capital Expenditures Non-Labor	-	-	-	5,230	10
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**5,240**	**10**
Capital Expenditures Indirect Costs	-	-	-	102	0
Capital Total	**-**	**-**	**-**	**5,342**	**10**
O&M Labor	-	-	-	-	-
O&M Non-Labor	-	-	-	-	-
O&M Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
O&M Indirect Costs	-	-	-	-	-
O&M Total	**-**	**-**	**-**	**-**	**-**
Units					
Solid State Drives	-	-	-	-	**100**
Unit 2	-	-	-	-	**-**
FTE*	-	-	-	0.1	**0.0**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Meteorology Super Computer Replacements					
Capital	**-**	**-**	**-**	**5,240**	**10**
Labor	-	-	-	9	0
Non-Labor	-	-	-	5,230	10
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Total	**-**	**-**	**-**	**5,240**	**10**

Business Purpose:

SDG&E owns and operates three supercomputers that run five ensemble members of the Weather Research and Forecasting (WRF) model at 2-kilometer and 6-kilometer horizontal resolution. These forecast simulations are displayed in visualization portals to help SDG&E meteorologists analyze and prepare accurate weather forecasts. They were also integrated into fire behavior and fire potential tools, contributing to the calculations of ignition probability and estimated wildfire consequence. Data produced from each forecast model run supported operational products such as the SDG&E Fire Potential Index (FPI), wildfire modeling software, and the United States Forest Service's Santa Ana Wildfire Threat Index (SAWTI), which informed day-to-day decision-making and enabled situational awareness relating to the potential for significant wildfire activity. Given the deep integration of these datasets into SDG&E operations and the age of the supercomputing infrastructure used to create them, preventative maintenance was needed to maintain the health of the hardware and provide reliable data.

Project Justification:

The SDG&E meteorology supercomputers were installed in 2018 and were used to produce five unique weather models twice daily. These models generated forecasts of wind, humidity, vegetation moistures, and other inputs that were imperative for understanding the evolution of the wildfire environment. It also informed day-to-day operations and high-impact PSPS decision-making, including FPI ratings and identification of areas in scope for potential PSPS events. Due to their heavy use and limited downtime, these supercomputers were projected to reach end of reasonable lifespan after five years. In anticipation of this loss, two new supercomputers were purchased in 2022. However, these systems were not expected to be fully operational with all software and forecast models until mid-summer 2023. Proactive replacement of all Solid State Drives (SSDs) within the previously existing operational supercomputers would improve the overall health of the systems, allowing them to be maintained for a minimum of two to three additional years at 80-90% of their peak performance, resulting in more reliable data flows until the new systems could be operationalized.

Project Scope:

After missing a number of operational weather forecast model runs in the first two months of 2023 due to hardware failures, an immediate need to replace SSDs and prevent further failures was identified. Due to the infrastructure age and proximity to projected end-of-life, it was determined that prioritizing drive replacement in the operational supercomputer would result in the most favorable outcome. A total of 45 SSDs were replaced in the operational supercomputer in March 2023, with an additional 45 installed in the backup system in April 2023.

Cost Drivers:

All costs were associated with the purchase and installation of SSDs for all nodes on the operational supercomputer and its backup system. A total of 100 drives were purchased, with 45 SSDs installed per supercomputer and five allocated spares designated for each system.

Project Timing and Phases:

Through daily monitoring, a series of hardware failures were identified on the operational supercomputer in January and February of 2023. All parts identified for replacement on the operational system were swapped out in March 2023, while all parts identified for replacement on the backup system were installed in April 2023.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy. All replacement hardware was procured by an external vendor as part of an existing agreement.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.3.5. This program does not have specified targets.

Risk Identification and Mitigation:

The risk program addressed was the immediate need to resolve operational weather forecast model runs that failed due to hardware failures. If not mitigated, weather forecast for a Public Safety Power Shutoff (PSPS) event and during would not be available, impacting decision making to mitigate a wildfire.

Consideration of Alternative Solutions:

Do Nothing: The supercomputing hardware had already begun to face periodic failures due to the age of the infrastructure and its proximity to the end of its projected lifespan of five years, resulting in several missed forecast model runs in late 2022 and early 2023. Taking no proactive measures and responding to hardware failures as they occurred may have increased the frequency of missed forecasts, potentially resulting in a lack of critical data, including the fire potential index, wind gust forecasts, ignition probability, and estimated wildfire consequence that would be imperative for PSPS operations.

Replace supercomputers: While replacing the supercomputers with new units would have incorporated new technology and resulted in faster and more reliable access to forecast model runs, the cost to fully replace the two operational systems would have likely been in the millions of dollars.

Coordination with Similar Programs

N/A

Stakeholder Impact and Engagement:

The forecast data generated by these supercomputers is shared with researchers and various stakeholders, and made available through an external portal that enables public accessibility of these datasets through web services and visual maps.

Metrics:

The table below shows the post processing success rates of Weather Research and Forecasting (WRF) models in 2023. While missed forecast runs in January and February 2023 contributed to a 95.9% success rate of model runs in the Q1, nearly 100% of model runs were successfully completed and post-processed following the replacement of all SSDs in early March 2023.

Quarter	Post processing success rate
2023 Q1	95.9%
2023 Q2	100.0%
2023 Q3	99.5%
2023 Q4	99.9%

Utility Benchmarking:

N/A

Pictures:

N/A

Workpaper	Emergency Preparedness
Category	Public Emergency Communications Strategy
WMP Tracking ID	WMP.563

Description	**Public Emergency Communications Strategy Program**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	96	122	208	246	216
Capital Expenditures Non-Labor	647	4,352	4,979	5,159	10,191
Capital Expenditures Direct Costs Subtotal	**743**	**4,474**	**5,187**	**5,405**	**10,408**
Capital Expenditures Indirect Costs	92	207	182	339	347
Capital Total	**835**	**4,681**	**5,369**	**5,744**	**10,755**
O&M Labor	57	442	1,159	1,370	1,840
O&M Non-Labor	4,203	7,787	9,021	8,111	8,557
O&M Direct Costs Subtotal	**4,260**	**8,230**	**10,180**	**9,481**	**10,397**
O&M Indirect Costs	66	365	872	1,205	804
O&M Total	**4,326**	**8,595**	**11,052**	**10,687**	**11,201**
Units					
	The variety of work activities in this category makes it infeasible to identify a single unit of measurement.				
FTE*	1.3	4.6	10.8	12.5	**15.5**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					290

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	Prior Years Spend				Track 3
	2019	2020	2021	2022	2023
PSPS Communications Practices					
Capital	**-**	**4,474**	**3,834**	**1,352**	**-**
Labor	-	122	172	1	-
Non-Labor	-	4,352	3,661	1,351	-
O&M	**4,260**	**8,230**	**9,052**	**8,254**	**8,572**
Labor	57	442	822	831	1,090
Non-Labor	4,203	7,787	8,231	7,423	7,483
PSPS Communications Practices Total	**4,260**	**12,704**	**12,886**	**9,607**	**8,572**
WMP AFN Customer Support					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**-**	**-**	**1,128**	**1,227**	**1,825**
Labor	-	-	337	539	750
Non-Labor	-	-	790	688	1,074
WMP AFN Customer Support Total	**-**	**-**	**1,128**	**1,227**	**1,825**
Public Safety Partner Portal Enhmt					
Capital	**-**	**-**	**1,354**	**682**	**5**
Labor	-	-	36	20	0
Non-Labor	-	-	1,318	662	5
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Public Safety Partner Portal Enhmt Total	**-**	**-**	**1,354**	**682**	**5**
ENS Enhancement WMP					
Capital	**743**	**0**	**-**	**1,443**	**341**
Labor	96	0	-	189	140
Non-Labor	647	-	-	1,255	201
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
ENS Enhancement WMP Total	**743**	**0**	**-**	**1,443**	**341**
PSPP Mobile App					
Capital	**-**	**-**	**-**	**1,927**	**402**
Labor	-	-	-	37	20
Non-Labor	-	-	-	1,890	381
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
PSPP Mobile App Total	**-**	**-**	**-**	**1,927**	**402**
PSPP All Hazards & K2					
Capital	**-**	**-**	**-**	**-**	**8,260**
Labor	-	-	-	-	53
Non-Labor	-	-	-	-	8,207
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
PSPP All Hazards & K2 Total	**-**	**-**	**-**	**-**	**8,260**
WMP ENS Operation Megaphone					
Capital	**-**	**-**	**-**	**-**	**1,400**
Labor	-	-	-	-	2
Non-Labor	-	-	-	-	1,398
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
WMP ENS Operation Megaphone Total	**-**	**-**	**-**	**-**	**1,400**
Total	**5,003**	**12,704**	**15,367**	**14,886**	**20,805**

Business Purpose:

To comply with Decision 21-06-034, in 2023, the Public Emergency Communication Strategy program consisted of several initiatives to allow SDG&E to effectively communicate with customers and the public at large regarding critical wildfire safety information. This included Public Safety Power Shutoff (PSPS) Communication during outages due to wildfires and PSPS events, including the necessary notifications, media updates, signage, and other critical situational awareness information were provided to customers and those potentially impacted. WMP Access and Functional Needs (AFN) Customer Support included O&M spend for programs targeting AFN populations, including message translation, additional support programs, and tribal outreach.

Capital costs in 2023 included enhancements and updates to existing tools that were necessary for effective communication with customers and public safety partners during PSPS events. The three projects related to the Public Safety Partner Portal (PSPP), PSPP Mobile App, PSPP All Hazards & K2, and Public Safety Partner Portal Enhancement. The two Enterprise Notification System (ENS) Projects, ENS Enhancement WMP and WMP ENS Operation Megaphone, involved necessary immediate fixes to the customer communication system to enable PSPS notifications that were accurate and had the capacity to reach all customers potentially impacted within an actionable time period.

PSPS Communication Practices:

D.21-06-034 requires each electric investor-owned utility to conduct PSPS education and outreach, including surveys, in "prevalent" languages, as defined in D.20-03-004, in its service territory. Each utility must conduct, at a minimum, two PSPS education and outreach surveys accessible to all customers each calendar year. To comply with these requirements, SDG&E identified the need for the communication of public safety information and implemented the necessary creative development and media buying strategies to support critical public awareness, education, and safety outcomes. These campaigns leveraged a range of mass market communication tactics developed in collaboration with our agency of record, identifying consistency, clarity, and regulatory alignment across all outreach efforts. Media buys were strategically executed to secure time and necessary recipients across broadcast (radio and television), print (newspapers and magazines), and digital platforms, including paid digital and social channels.

Regular reviews of PSPS customer notifications templates for information disseminated to affected customers during a PSPS to keep messaging accurate and appropriate were identified as a critical tasks and prioritized for annual updates basis. This process incorporated customer feedback to improve clarity, accessibility, and overall message effectiveness, reflecting commitment to continuous improvement and customer-centered communication. To further support equitable access to critical safety information, notifications were translated and audio recorded in the 21 most prevalent languages spoken in the region, as well as American Sign Language.

WMP AFN Functional Needs Customer Support:

AFN Program reduced the impacts of wildfire-related outages and PSPS de-energizations on vulnerable customers, including those with medical, mobility, communication, or other functional challenges. The program provided equitable access to emergency preparedness resources, such as portable back up batteries, generator rebates, mobile charging stations, hotel accommodations, accessible transportation, food assistance, and resiliency items, to support safety and independence during outages. The program also prioritized proactive outreach, multilingual and accessible communications, and partnerships with state agencies, tribal governments, healthcare providers, and more than 200 Community-Based Organizations (CBOs). Through education, preparedness efforts, and culturally appropriate engagement, especially in High Fire Threat Districts (HFTD), the AFN Program served as a comprehensive strategy to enhance resiliency, equity, and safety for vulnerable populations during emergencies.

ENS Enhancement WMP & ENS Operation Megaphone:

The ENS Enhancement Project and ENS Operation Megaphone were capital sustainment initiatives focused on maintaining compliance, reliability, and operational effectiveness of the existing ENS while it continued to serve as a Tier 1 emergency communications platform for wildfire and wildfire prevention mitigations. ENS was actively used to support customer safety notifications during PSPS emergency events, and therefore needed to meet evolving regulatory, audit, and reporting requirements without reliance on manual workarounds. This project delivered targeted enhancements to address mandatory regulatory changes, improve reporting accuracy and auditability, strengthen system performance during high volume events, and reduce operational risk by improving automation and usability. Limited, pragmatic user interface enhancements were included to help operators execute time critical emergency workflows accurately and consistently under real world conditions. ENS Enhancement referred to a project to update the existing platform to maintain usability and accuracy in selecting circuits and reporting customer data whereas ENS Operation Megaphone referred to increasing the capacity to send real-time messages to customers, volume events, and reducing operational risk by improving automation and usability. Limited, pragmatic user interface enhancements were also included so that operators could execute time critical emergency workflows accurately and consistently under real world conditions for wildfire and PSPS situations. These improvements do not represent system modernization or replacement; they are risk mitigation investments necessary to safely operate ENS while it remains in service and to protect customer safety, regulatory compliance, and emergency response effectiveness under the Wildfire Mitigation Plan.

PSPP All Hazards & K2:
The SDG&E Public Safety Partner Portal was developed to comply with a CPUC regulation mandating utilities develop an online Portal that would provide Public Safety Partners with important situational awareness information. The Partner Portal focused on developing one stop shop for SDG&E emergency information. The Portal provides a centralized location to gain situational awareness on active and future electric outages, customer impact counts including high risk totals, service territory weather forecast, and important information regarding EOC activations. Users can access emergency related resources such as 24/7 SDG&E personnel contact information, emergency plans, and event specific social media kits to assist with communications to responders and communities. Additionally, the project focused on developing a replacement for the end of life K2 PSPS notification system so that SDG&E could comply with notification regulations to Public Safety Partners.

This capital project focused on updating existing IT platforms to meet regulatory requirements (Decision 19-05-042) and strengthen SDG&E's ability to deliver consistent, reliable situational awareness and communications to public safety partners during wildfire events. The All Hazards and K2 Modernization Program was designed to allow SDG&E to deliver timely, accurate, and consistent emergency information to Public Safety Partners (PSPs) beyond PSPS activation timelines, extending the established Public Safety Partner Portal functionality to a broader emergency management context including wildfire response and resiliency, per regulatory requirements in GO 166. By deploying an always on, centralized Partner Portal and a modernized messaging platform, the program enhanced operational readiness, addressed longstanding gaps between PSPS specific and wildfire related communications, and reduced manual processes that would create risks of delayed response and noncompliance during high risk conditions.

Public Safety Partner Portal Enhancement:
The PSPP Enhancements were developed to strengthen the accuracy, reliability, and usability of the Public Safety Partner Portal and related external-facing workflows that public safety agencies depend on during PSPS events. These enhancements were aimed at improving partners' situational awareness by creating a mobile app that provided timely, clear, and consistent delivery of PSPS related information.

PSPP Mobile App:
The PSPP Mobile App capital project focused on extending the PSPP All Hazards & K2 Modernization project's web functionality to the existing Public Safety Partner Portal Mobile App as well as provide Public Safety Partners the ability to subscribe to push notifications for their communities, leading to quicker and easier information sharing and fulfilling partners' requests for easily accessible information.

Project Justification:

PSPS Communication Practices:
Decision 19-05-042 mandates that customers understand the purpose of proactive de-energization, the process electric investor owned utilities use to initiate it, how to safely manage through a de-energization event, and the potential impacts if PSPS is deployed. To meet these requirements, utilities used common nomenclature aligned with state and local emergency response messaging and the California Alert and Warning Guidelines, developed notification and communication protocols that reached customers regardless of location and delivered information in an understandable manner, and communicated in multiple languages and formats that addressed diverse access and functional needs using multiple channels.

SDG&E worked to reach all customers within its service territory through a comprehensive, public education campaign focused on wildfire safety, PSPS awareness, and customer preparedness and resilience. This territory wide campaign educated customers on wildfire risk, the purpose and impacts of PSPS events, and actions customers can take to remain safe and prepared. Developed in partnership with the company's marketing and media buying agencies of record, the campaign reflected both an industry's best practice and a mandate of the CPUC. Campaign reach and effectiveness are measured and evaluated annually, with insights used to continuously enhance messaging, channel mix, and overall performance.

WMP AFN Functional Needs Customer Support:
Service delivery and support programming was justified through the regulatory requirements set out in the PSPS OIR Phases 1-3 for SDG&E's obligations to support customers with AFN:
- Customer Education Campaigns (Phase 1)
- AFN Customer Identification Campaigns (Phase 1 & 2)
- CBO, healthcare partnerships (Phase 3)
- Multi-family building, building manager, and tenant outreach (Phase 3)
- Notifications to paratransit agencies (Phase 3)
- Programs/Pilots to support Resiliency for AFN Customers (Phase 3)

The approach was used to coordinate effective outreach with existing CBOs and to partner with non-profits doing similar PSPS and wildfire work rather than duplicating efforts that existed within the community.
Tribal engagement utilized a culturally appropriate and value-driven approach to communications, engagement, and partnerships. This coordination involved engagement with Tribal Councils, participation in tribal working groups and workshops, and providing safe access to operate and maintain SDG&E's facilities and infrastructure to the levels of safety needed to prevent wildfires utilizing access protocols established by Tribal Nations. Tribal access protocol required tribal review and approval which may have involved cultural monitors, safety escorts and or checking in with the tribal offices upon arrival to the reservations.

ENS Enhancement WMP & ENS Operation Megaphone:
The company is required to maintain adequate customer communication capabilities to notify customers of potential shutoffs during a PSPS. The existing system did not meet customer capacity requirements and had a user interface that created operational risks of error so it was enhanced to mitigate those deficiencies. Enhancements to the user interface (UI) improved usability, reduced operator error during emergency activations, and enabled faster, consistent execution of regulated notification workflows. Adding capacity doubled the ability of the system to notify 100,000 customers simultaneously, whereas the previous system capacity was 50,000. Collectively, these enhancements allowed SDG&E to continue to demonstrate reasonable, compliant, and auditable emergency communications while longer-term ENS modernization efforts progressed in parallel.

PSPP All Hazards & K2:
The company is required to conduct notifications to public safety partners during a PSPS activation. The existing system, K2, was end of life and difficult for responders to use. Public Safety Partners identified the need for an always available Partner Portal and modernized notification platform.

Public Safety Partner Portal Enhancement:
End-to-end testing was required to validate that all enhanced workflows in the mobile app performed correctly across integrated systems and displayed accurate information to external agencies. Because these capabilities directly support real-time emergency coordination, testing enabled notifications, data flows, and user-facing components to be stable and fully reliable. The associated costs reflect the effort necessary to confirm the enhancements were thoroughly validated and ready for operational use by public safety partners.

PSPP Mobile App:
Extending the All Hazards and K2 Modernization Program functionality to the PSPP Mobile App aligned with the goal to guide SDG&E delivered timely, accurate, and consistent emergency information beyond PSPS, addressing longstanding gaps between PSPS and wildfire-related communications. This approach represented the most cost effective and lowest risk solution because it built upon SDG&E's proven systems (Public Safety Partner Portal and Alerts by SDG&E and provided the highest value relative to cost while providing operational continuity and long-term sustainability.

Project Scope:

PSPS Communication Practices:

To comply with the Commission's regulatory requirements described above and communications best practices, the scope of SDG&E's public education campaigns included territory-wide exposure as well as systematic measurement of media by reach to evaluate overall campaign effectiveness. Reach was primarily measured by impressions or views of creative assets, representing how often campaign advertisements were delivered across paid channels. Campaign impressions were tracked cumulatively across the full mix of tactics employed, including print, broadcast, and digital advertising, which provided a comprehensive view of audience exposure throughout the service territory.

The scope and variables of this research evolved each year based on several factors, including customer participation levels, the number of PSPS activations each year, and the number of customers impacted by those events. As reflected in SDG&E's Pre Season and Post Season PSPS reporting, this adaptive research approach aligned with CPUC requirements for ongoing education and outreach evaluation while also representing a communications best practice. By adjusting research design to reflect real world operating conditions, SDG&E assisted with customer insights remain relevant, actionable, and responsive to changing wildfire risk and PSPS activity across its service territory.

WMP AFN Functional Needs Customer Support:

SDG&E contracted with existing non-profits, 211 San Diego and/or United Way of Orange County (Contractor), who then served as an information and resource hub for populations affected by PSPS events, in collaboration with CBOs. The Contractor acted as the primary provider of PSPS resiliency support and materials, connecting individuals with unique needs to appropriate community organizations as necessary. The Contractor supported potentially impacted populations. Because PSPS events could occur at any time, the Contractor continuously promoted awareness of available services and remained prepared to assist at all times. Services were available to residential customers, including individuals not listed as the utility's customer of record (e.g., visitors, tenants, household members). Collectively, these groups were referred to as "Customers." Priority was given to customers with AFN, as defined in Government Code 8593.3. These included individuals with developmental, intellectual, or physical disabilities; chronic conditions; injuries; limited English proficiency; older adults; children; people in institutional settings; low income or unhoused individuals; transportation disadvantaged individuals (including those reliant on public transit); and those who were pregnant.

The accessible transportation contractor was responsible for providing both ambulatory and wheelchair accessible transportation for individuals or goods before, during, or after a PSPS event. Customers were referred to the Contractor through the 2 1 1 San Diego Community Information Exchange (CIE) platform or through the United Way of Orange County. The contract required that the vendor be prepared to serve Access and Functional Needs (AFN) customers before, during, or after an SDG&E initiated PSPS event.

The accessible communication contractor provided Video Remote Interpreting (VRI) services that enable customers to connect with certified American Sign Language (ASL) interpreters on-demand at SDG&E facilities or in the field. While the contractor primarily supports ASL users, it also provides access to additional languages through its interpreter network. The VRI platform is available 24/7. The contractor produces Accessible Video Production (AVP) content by converting client-submitted scripts into ASL videos with English voice narration and closed captions.

O&M funds were also utilized to fund one Tribal Liaison FTE who supported all tribal communities within SDG&E's service area. This position conducted regular touchpoints with Tribal Councils, coordinated tribal wildfire preparedness needs, assisted tribal entities during PSPS events, and coordinated access to utility equipment on tribal lands providing effective wildfire mitigation activities to occur.

ENS Enhancement WMP & ENS Operation Megaphone:

The ENS Enhancement Project was a limited sustainment effort focused on maintaining the continued operability, compliance, and reliability of SDG&E's existing ENS, which was built on the legacy ENS platform and remained in active use to support customer safety notifications associated with Wildfire Mitigation Plan activities. This effort addresses mandatory regulatory and CPUC reporting requirements, implements targeted automation to reduce manual processing, audit risk, and operational error, and delivers necessary performance and capacity improvements providing ENS can reliably execute high volume emergency PSPS notifications when required. The project did not modify the underlying system architecture, security model, or functional purpose of ENS, and did not constitute system modernization or replacement. Any user interface changes were limited to operator user interface and usability refinements required to support accurate execution of time sensitive emergency communications and reporting. These enhancements were required to mitigate operational and compliance risk, maintain dependable emergency communications, and support public safety obligations under the Wildfire Mitigation Plan for the period in which ENS remained in service

PSPP All Hazards & K2:
The scope of the All Hazards and K2 Modernization Program included delivering a centralized, always available Partner Portal web application and a modernized notification platform designed to strengthen wildfire preparedness, resilience, and situational awareness for Public Safety Partners. The project addressed documented challenges such as inconsistent messaging, fragmented communication channels, limited access to timely information, and manual, resource intensive processes that delayed emergency response and strained internal capacity. It also encompassed replacing the end-of-life K2 PSPS notification system which was utilized to provide public safety partners with PSPS incident notifications. Once the K2 system required replacement, rather than purchasing a new system, SDG&E chose the cost-effective implementation of an integrated solution within the existing Public Safety Partner Portal to improve wildfire operational readiness, enhance user experience, and provide historic data to be readily available to support mandated reporting and CPUC aligned communication standards. The scope further included developing a sustainable operating model capable of supporting 24×7 emergency communications, maintaining Tier 1 EOC activation requirements, and assisting SDG&E with meeting regulatory expectations for accuracy, speed, consistency, and transparency in emergency communications. Specific deliverables included:
• Discovery & Accelerate to Build (A2B) Analysis: Conducted evidence driven research, interviews, and subject matter expert sessions to validate requirements and provide alignment with operational needs and regulatory expectations.
• Service Design & Requirements Development: Developed detailed system requirements, user flows, and user experience designs; defined and validated the MVP through structured partner and SME input.
• System Modernization & Technical Integration: Replaced the end-of-life K2 PSPS notification system and built the centralized, always on Partner Portal; integrated with existing Public Safety Partner Portal and Alerts by SDG&E applications to create a unified emergency communications architecture.
• Operating Model Development: Established a robust 24×7 support model, updated internal processes, and aligned operational practices with Tier 1 EOC activation standards and CPUC communication requirements.
• Testing, Validation & Deployment: Validated end to end system performance, conducted user testing, confirmed regulatory compliance requirements, and deployed the MVP followed by full scale implementation.
• Reporting, Training & Transition Support: Provided staff and partner training, transitioned stakeholders from manual workflows to the new platform, and provide reporting and data retention practices meeting mandated regulatory expectations for wildfire preparedness and after-action review.

Public Safety Partner Portal Enhancement: End to end system testing of PSPP enhancements, performed by a managed services provider.

PSPP Mobile App:
The scope of the PSPP Mobile App was to extend the enhanced functionality delivered to the Partner Portal web application delivered in the PSPP All Hazards & K2 Modernization program to the existing mobile application to strengthen wildfire preparedness, resilience, and situational awareness for Public Safety Partners. The project addressed documented challenges such as inconsistent messaging, fragmented communication channels, limited access to timely information, and manual, resource intensive processes that delayed emergency response and strained internal capacity.

Cost Drivers:

PSPS Communication Practices:
The majority of costs associated with SDG&E's public education efforts were driven by the development of creative assets and the execution of media buys for the annual, paid Public Education Campaigns. These comprehensive, territory wide campaigns are inherently influenced by prevailing media market conditions, with costs fluctuating based on demand and external factors such as major national events, election cycles, and other market pressures. As a result, campaign planning and execution require ongoing coordination with SDG&E's media agencies.

Research costs are a significant component of SDG&E's Communications Practices, reflecting the central role of customer insight in evaluating and improving public education and notification efforts. These research activities—including pre season, post season, and event based surveys—are required under CPUC oversight and are designed to assess customer awareness, comprehension, preparedness, and satisfaction with PSPS communications. As a result, research investments are an essential input to both regulatory reporting and continuous improvement of public safety messaging.

The scale and cost of research efforts vary from year to year and are directly influenced by PSPS activity levels. The occurrence and frequency of PSPS events affect survey timing, the number of eligible participants, and overall participation rates, requiring flexibility in research design and execution.

WMP AFN Functional Needs Customer Support:
During a PSPS event, key cost drivers include collaboration with 211 and United Way to provide direct resiliency support and essential materials to impacted communities. These partnerships, for which SDG&E pays a monthly fee, enable coordinated distribution of resources, real-time customer assistance, and targeted outreach to individuals who may need additional help during an outage. Costs also arise from an annual O&M fee to maintain services providing accessible communication so that hearing-impaired individuals can receive timely, clear, and actionable PSPS notifications through tools such as captioned messaging. Accessible transportation is another driver, as customers with mobility challenges may need safe, ADA-compliant transit to community resource centers, charging sites, or other support locations during the shutoff. In addition, expenses are associated with engaging third-party consulting services to conduct PSPS impact studies, which help evaluate customer needs, assess program effectiveness, and identify strategies to strengthen resilience for vulnerable populations. Tribal engagements costs were limited to reasonable labor costs for SDG&E staff to conduct this work. These O&M costs are incurred as the work or project is completed.

ENS Enhancement WMP & ENS Operation Megaphone:
The majority of 2023 ENS Enhancement costs were attributable to vendor licensing, maintenance, and support for the communications solution, supplemented by engineering and purchased services required to implement compliance driven enhancements. In particular, 2023 included license extensions and product upgrades approved to provide continuity of service and avoid regulatory or operational exposure, reflected in a major ENS requisition totaling $1.85M tied to 2023 license extensions and upgrades. These costs were treated largely as licensing based sustainment, not discretionary feature expansion. Additional 2023 spend included annual software support and maintenance necessary to keep the platform operational while enhancements to reporting and automation were delivered. Collectively, the 2023 cost profile reflects a risk mitigation and compliance preservation investment—maintaining safe, auditable emergency communications during a transitional period for a legacy platform nearing end of life.

PSPP All Hazards & K2:
The primary components driving project costs are those associated with the modernization and integration of core systems, particularly the replacement of the end-of-life K2 PSPS notification system and the development of a centralized, always-available Partner Portal. These efforts require substantial technical design, engineering, and integration work to unify currently fragmented communication channels, resolve long-standing data-access challenges, and build a reliable multi-hazard notification platform that aligns with CPUC standards for communicating with Public Safety Partners. The scope describes extensive system modernization and technical integration needs, including platform rebuilds, portal development, and integration with existing Public Safety Partner Portal and Alerts by SDG&E applications, all of which inherently represent major cost contributors due to their complexity, infrastructure requirements, and need for rigorous validation.
In addition to technology modernization, significant costs are driven by the supporting activities required to deliver a compliant, sustainable operating model. These include evidence-driven research and analysis, detailed service design, 24×7 operating model development, comprehensive testing and validation, and the transition of stakeholders from manual workflows to the new platform. The need for partner and SME engagement, user experience design, staff and partner training, and enhanced reporting and data-retention capabilities further contribute to overall expenditures. Together, these cost drivers reflect the scale of work required not only to modernize critical emergency communication technology but also providing SDG&E to meet regulatory expectations for accuracy, speed, consistency, and transparency in all-hazards emergency communications.

Public Safety Partner Portal Enhancement: Vendor services and internal labor for end to end testing.

PSPP Mobile App:
The primary components driving project costs are those associated with extending the existing capabilities of the PSPP Mobile app to include functionality delivered to the web application in the PSPP All Hazards & K2 Modernization project. This includes the modernization and integration of core systems and the development of a centralized, always-available Partner Portal. These efforts require substantial technical design, engineering, and integration work to unify currently fragmented communication channels, resolve long-standing data-access challenges, and build a reliable multi-hazard notification platform that aligns with CPUC standards for communicating with Public Safety Partners.

Project Timing and Phases:

PSPS Communication Practices:
The Wildfire Safety and PSPS Public Education Campaign followed a structured annual timeline designed to support regulatory compliance, operational readiness, and continuous improvement. In the first quarter, efforts focused on creative development, internal approvals, finalization of campaign assets, and execution of media buy activities. Campaigns were launched in market during the second and third quarters of the calendar year, coinciding with heightened wildfire risk, while PSPS notification content was reviewed, updated, and translated during the same period assisting with accuracy, accessibility, and consistency across all customer touchpoints. In the third and fourth quarters, pre-season and post-season customer research was conducted to evaluate campaign effectiveness, message comprehension, and customer preparedness.

WMP AFN Functional Needs Customer Support:
A project timeline was not required for this effort because the wildfire mitigation and response support activities involved did not constitute a traditional, phased project with discrete milestones or dependent tasks. The support provided included collaboration with 211 and United Way, accessible communications, accessible transportation, and tribal coordination, operated as ongoing operational functions rather than time-bound project deliverables. As such, there were no defined phases, critical path dependencies, or deadlines that would have necessitated a formal project schedule.

ENS Enhancement WMP & ENS Operation Megaphone:
Because of the nature of the effort, the work and effort that was built into the platform by the vendor, there were no specific timelines or milestones to meet other than having the enhancements ready and tested in preparation for peak Fire Season in San Diego and Southern Orange County.

PSPP All Hazards & K2:
The project was delivered in four major phases with a critical deadline to complete a minimum viable product by September to support sending Public Safety Partner notifications during the 2023 peak season of wildfire risk. The four major phases were Accelerate to Build (A2B), Discovery, Delivery, Transition & Support.
• Accelerate to Build (A2B) Phase, January to March: Strategy, research planning, technology and data assessment, concept prototyping.
• Discovery Phase, March to May: MVP backlog definition, architecture/test strategy, personas and user flows, experience design.
• Delivery Phase, May to September: MVP development and release, training and communications plan.
• Transition & Support, September to December: 24/7 support model implementation.

Public Safety Partner Portal Enhancement: These are trailing charges in 2023 for end to end testing of the mobile app.

PSPP Mobile App:
The project aligned with the timing and phases of the All Hazards & K2 Modernization project which was delivered in four major phases with a critical deadline to complete a minimum viable product by September to support communicating with Public Safety Partners during the 2023 peak season of wildfire risk. The four major phases were Accelerate to Build (A2B), Discovery, Delivery, Transition & Support. The project followed an agile software development methodology using 2-week sprints to rapidly build and validate functionality.
• Accelerate to Build (A2B) Phase, January to March: Strategy, research planning, technology and data assessment, concept prototyping.
• Discovery Phase, March to May: MVP backlog definition, architecture/test strategy, personas and user flows, experience design.
• Delivery Phase, May to September: MVP development and release, training and communications plan.
• Transition & Support, September to December: 24/7 support model implementation.

Approval Process/Procurement Process:

These programs were approved in accordance with SDG&E's Approval and Commitment Policy.

PSPS Communication Practices:
All Wildfire Safety and PSPS public education campaign creative assets and media buys underwent a standard internal review, revision, and approval process involving marketing leadership and other internal stakeholders. SDG&E executed its paid public education campaigns in partnership with its marketing and media buying agencies of record, which were selected through a competitive bid process. These agencies managed creative development and media purchasing activities under SDG&E oversight and were responsible for implementing approved strategies across paid channels. Leveraging agencies of record supported disciplined cost management, standardized performance evaluation, and regulatory transparency, reflecting the best practice for executing largescale, mandated public education campaigns.
SDG&E conducted its pre season and post season PSPS research in partnership with a third party research contractor providing objectivity, methodological rigor, and regulatory credibility. The research contractor of record was selected through a competitive bid process and supported SDG&E's third party research needs related to PSPS communications.

WMP AFN Functional Needs Customer Support:
SDG&E utilized longstanding partnerships with existing vendors. Most organizations or vendors specialized in their areas and other options were not available.

ENS Enhancement WMP & ENS Operation Megaphone:
Project approval followed established SDG&E WMP program governance, beginning with the development and submission of business justification documenting the need for regulatory reporting improvements, notification capacity increases, automation of manual processes, and targeted system and UI enhancements to address operational risk and compliance gaps. From a procurement and resourcing standpoint, the 2023 ENS enhancements leveraged the existing contractual framework, originally established through a competitive bidding process in 2006, and therefore did not initiate a new vendor competition. As previously discussed, this was a necessary short term improvement to mitigate operational risk and provide the ability to notify customers during a PSPS event in 2023, therefore continuing improvements with the existing vendors was determined to be the most expeditious and prudent way ahead.

PSPP All Hazards & K2:
The All Hazards and K2 Modernization Program progressed through SDG&E's established internal procurement and governance procedures to provide compliance with corporate standards for transparency, fairness, and cost effectiveness. Consistent with SDG&E practice, the business partnered closely with the Procurement department to conduct vendor evaluations, develop scope requirements, and validate alignment with wildfire-related operational needs, regulatory expectations, and long-term emergency communication objectives.
Vendor selection for this program adhered to SDG&E's requirement for a fair and unbiased procurement process, including prior year competitive evaluation and qualification of the selected vendor. Because the vendor had already been competitively assessed and was fully familiar with SDG&E's systems and data, emergency communication processes, and operational expectations, continuing with this provider represented the most cost effective and lowest risk approach. This avoided significant schedule delays, onboarding inefficiencies, and re-discovery work that a new vendor would have required—factors explicitly recognized in the program's justification for its selected approach.

Public Safety Partner Portal Enhancement:
The vendor was selected after a bid process centrally within IT. The vendor serves the system and end to end testing function for IT projects.

PSPP Mobile App:
The PSPP Mobile App project aligned with the All Hazards and K2 Modernization Program progression through SDG&E's established internal procurement and governance procedures. As the project's scope was to extend the All Hazards & K2 Modernization functionality to the existing mobile app, the most cost effective approach was to continue with the previously selected vendor.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.4.4. This program does not have specified targets.

Risk Identification and Mitigation:

PSPS Communication Practices: N/A

WMP AFN Functional Needs Customer Support: N/A

ENS Enhancement WMP & ENS Operation Megaphone:
The risks identified in this project were the operational risks of the inability of the current system to meet customer communication needs during a large PSPS event from a capacity standpoint, as well as reporting and UI functionality that did not meet operational requirements. In addition to customer safety impacts, the existing system was not sufficient to maintain regulatory compliance. The timeline of the project, completing enhancements by August 1st in preparation for potential Red Flag Conditions, created an operational risk on the program further justifying the decision to enhance an existing system given the time constraints.

PSPP All Hazards & K2:
The Partner Portal was designed to address key operational, financial, and regulatory risks associated with emergency response communications and situational awareness for Public Safety Partners. The Portal's design, governance, and implementation align with SDG&E's broader Risk Assessment and Mitigation Phase (RAMP) framework by reducing the likelihood and consequences of adverse public safety outcomes at a reasonable and justifiable cost.
A primary operational risk was fragmented, delayed, or inconsistent communications with Public Safety Partners during wildfire events, particularly when information was distributed through manual or program specific channels. Prior approaches had relied on email distributions, ad hoc notifications, and legacy tools, which increased the risk of conflicting information, delayed response, and increased workload for EOC staff during wildfire response operations. This risk was mitigated through the Partner Portal's role as a single, centralized source of truth for wildfire situational awareness, emergency status, GIS data, and communication history. The Portal was aligned with existing EOC activation processes and communication standards, allowing partners receive timely, accurate, and consistent information during wildfire conditions without duplicative outreach or manual intervention.
The Partner Portal replaced the legacy K2 PSPS notification system and consolidated capabilities that previously existed across multiple workflows, including Public Safety Partner contact management, notifications, and reporting. Mitigation was achieved by leveraging shared infrastructure, centralized data ingestion, and a programmatic delivery approach that allowed enhancements to benefit multiple SDG&E functions simultaneously. This approach avoided redundant investments, reduced technical debt, and lowered long term operating costs relative to maintaining wildfire specific or program specific solutions.
There was regulatory risk associated with incomplete documentation, inconsistent messaging, or limited auditability of partner communications during emergency events. The Partner Portal mitigated this risk by maintaining a centralized, time stamped record of communications, standardized messaging practices aligned with PSPS requirements, and consistent access to authoritative data used by Regulatory Affairs.
From a RAMP perspective, the Partner Portal functioned as an enabling mitigation that reduced the likelihood and consequences of wildfire risks by improving situational awareness, coordination, and decision making during emergency events. While the Portal itself was not a standalone physical risk mitigation, it supported multiple RAMP identified risks—such as wildfire response, emergency coordination, and system reliability—by improving the effectiveness of existing operational mitigations.

Public Safety Partner Portal Enhancement: N/A

PSPP Mobile App: N/A

Consideration of Alternative Solutions:

PSPS Communication Practices:
1. Do Nothing- This would result in failing to meet CPUC requirements and SDG&E being out of compliance.
2. Develop in House-The option to develop and execute a regional marketing campaign and conduct media buying using internal resources, rather than utilizing agencies of record, was evaluated and determined not to be feasible. At that time, the Company did not have the internal expertise or staffing capacity required to design, manage, and implement a comprehensive marketing campaign at the regional scale required to meet CPUC requirements. In addition, we lack the specialized resources and technical expertise necessary to execute large scale media buying efforts effectively. Implementing these functions internally would also result in higher overall costs, particularly with respect to media purchases. The Company's media agency of record is able to leverage aggregated, large scale media buys across multiple clients, allowing media to be purchased at significantly more competitive rates than the Company could achieve independently.

WMP AFN Functional Needs Customer Support:
1. Do Nothing- This would result in failing to meet CPUC requirements and being out of compliance.
2. Develop in house AFN Service Capabilities--Instead of utilizing approved contractors, SDG&E could have attempted to set up a hotline or support system to meet AFN customer needs such as hotel stays, accessible transportation, ASL translation,. etc. Because SDG&E did not have existing capabilities in these areas it was identified that this approach would have been too costly, time consuming, and likely to result in less effective service than utilizing existing vendors and CBOs that were already trusted organizations in this area.

ENS Enhancement WMP & ENS Operation Megaphone:
1. Do Nothing--Keeping the existing system in place with no enhancements would have meant continuing to utilize a system with a complicated user interface prone to operational errors and unable to quickly notify more than 50,000 customers at once.
2. Build a new system--Purchasing a new solution was discusses as the ENS solution was toward the end of life, however it was determined that a new vendor could not be in place in time for peak wildfire risk and potential PSPS events in 2023. Since vendors were being evaluated for a new ENS, it was decided to sustain the required maintenance for the current ENS system for the 2023 PSPS season while developing a long-term solution starting in 2024.

PSPP All Hazards & K2:
1. Do Nothing-This would have involved continuing to use the past it's lifespan K2 system and would have involved continuing to accept operational risks of error due to a variety of ad hoc solutions being utilized for partner communications.
2. Lower Tech Options-Lower-tech options—such as manual tracking, email-based communications, spreadsheets, or limited-function web portals—were considered but rejected because they perpetuated documented operational and regulatory gaps, including inconsistent messaging, fragmented channels, delayed information delivery, and insufficient auditability. These approaches could not meet CPUC requirements for timely, standardized, and auditable Public Safety Partner communications or support mandated reporting and record retention.
3. Build a new K2 Replacement--Building a new K2 replacement was considered, however it was identified that the capabilities required to replace the K2 system could be developed as a part of the existing Public Safety Portal infrastructure. Due to the cost, time, and system integration concerns with purchasing a new system it was decided to enhance the existing Portal tool to meet the requirements for a K2 replacement.
4. Select Another Vendor- After evaluating vendor alternatives, SDG&E determined that continuing with the existing, competitively vetted provider was the lowest-risk and most cost-effective option, providing continuity with internal systems, operational processes, and regulatory obligations

PSPP Mobile App:
The PSPP Mobile App was evaluated along with the All Hazards & K2 Modernization program as an integrated Partner Portal and notification platform and recommended approach to strengthen wildfire preparedness and resilience. The possibility of not extending the enhanced functionality of the web application to the mobile application was evaluated but SDG&E found the mobile app be necessary to meet Public Safety Partner expectations for communication during PSPS and wildfire emergencies.

Public Safety Partner Portal Enhancement:
N/A

Coordination with Similar Programs

PSPS Communication Practices:
For communication clarity and effectiveness, SDG&E maintained consistent messaging and core campaign elements in market without overlapping or message saturation across concurrent initiatives. The Marketing and Communications department worked closely with internal partners across SDG&E's WMP efforts to align messaging, timing, and delivery. This cross functional coordination allowed for public education campaigns, operational communications, and PSPS notifications that reinforced one another, reflecting best practices for integrated communications and supporting regulatory expectations for clear, timely, and coordinated public safety outreach.
SDG&E's marketing agencies of record coordinated with appropriate parties creative design and media buying for the company's advertising and public awareness efforts, including Wildfire Safety and PSPS public education campaigns. Leveraging agencies of record enabled efficient, large scale media buying through aggregated purchasing power, which helped extend campaign reach and maximize value while maintaining disciplined cost management. This model supported consistent execution across multiple channels while allowing flexibility to adjust tactics based on regulatory requirements, market conditions, and campaign objectives.

WMP AFN Functional Needs Customer Support:
SDG&E's AFN team worked closely with appropriate internal programs to coordinate support including but not limited to Emergency Management Customer Programs, Tribal Relations, Regulatory, and Facilities. Externally, AFN partners with numerous CBOs to eliminate redundancies in customer outreach and streamline community support. The AFN team reduced redundancies by providing or assigning support services delivered through resiliency support, accessible communication, accessible transportation, and third-party PSPS impact analysis, each unique in scope and function. These activities operated as distinct, essential components of the AFN program and were not duplicated elsewhere within the organization or through other initiatives; they often satisfied requirements of other organizations and programs, and the coordination was a critical part of success in 2023.
The Tribal Relations team at SDG&E coordinated with several internal groups, including but not limited to: Regulatory, Community Outreach, Access and Functional Needs, Environmental Services, Land Services, Customer Program Management, Fire Climate Science Adaptation, External Affairs and Comms, Construction and Vegetation Management, Supplier Diversity, and Emergency Management. The work with these groups helped eliminate redundancies in communication, tribal community priority review, appropriate maintenance and operational questions, natural and cultural resource management, and emergency response as they related to wildfire risk prevention and PSPS awareness. They also supported collaboration with liaisons from CalOES, CalTrans, and other regional partners for safety and risk aversion.

ENS Enhancement WMP & ENS Operation Megaphone:
No other adopted systems were available in the company to initiate such large call volumes with the identified customer information and after activation reporting capabilities so coordination was critical for use of ENS before moving to the new platform. Personnel who utilized the ENS system during PSPS events did so in support of the Emergency Operations Center, and their work was coordinated with internal Emergency Management, Customer Success, Regional Public Affairs, Regulatory, Legal, Communications, and AFN teams to promote consistency and alignment in the content and timing of all messages sent.

PSPP All Hazards & K2:
SDG&E's Partner Portal was developed in coordination with existing SDG&E public safety and emergency management programs to avoid duplicative systems, processes, and data sources. The Portal intentionally builds on and extends the established PSPS program framework— developed to support wildfire risk mitigation and which has become SDG&E's standard for compliant, timely Public Safety Partner communications—rather than creating separate tools for wildfire communications. By applying PSPS communication and situational awareness practices directly to wildfire response, SDG&E avoided the need for multiple platforms. Development and implementation were coordinated across SDG&E Emergency Management, EOC operations (including Planning, Liaison, and Situation Reporting roles), Regulatory Affairs, EOC IT, GIS, and Wildfire & Climate Science teams. These groups were already producing critical situational awareness data and partner communications, but often through fragmented and manual channels. The Portal consolidates these efforts into a single, centralized source of truth, reducing redundant partner outreach, ad hoc data requests, and parallel reporting processes across departments.

Public Safety Partner Portal Enhancement: N/A

PSPP Mobile App:
The PSPP Mobile App's functionality was extended to include the enhancements delivered in the All Hazards & K2 Modernization project. This project, along with All Hazards & K2, intentionally builds on and extends the established PSPS program framework rather than creating separate tools for wildfire communications. By applying PSPS communication and situational awareness practices directly to wildfire response, SDG&E avoided the need for multiple platforms. Extending the development and implementation that were coordinated across multiple SDG&E business units, the PSPP Mobile App was a critical component of the strategy to consolidate situational awareness data and partner communications into a single, centralized source of truth, reducing redundant partner outreach.

Stakeholder Impact and Engagement:

PSPS Communication Practices:
For SDG&E's Wildfire Safety and PSPS Public Education Campaign, the primary target audience was customers and the public across the service territory. Preseason and post season customer surveys were conducted annually to solicit direct feedback on Wildfire Safety and PSPS messaging that was active in market via Public Education Campaigns and PSPS Customer Notifications. This research was designed to measure customer recall and comprehension of campaign assets and key messages, providing that communications were not only received but clearly understood.
Survey findings were systematically analyzed and applied to enhance future customer communications and campaign creative, supporting a continuous improvement cycle year over year. This feedback driven approach represented both a regulatory requirement established by the CPUC and an industry best practice, reinforcing the organization's commitment to data informed decision making, customer understanding, and effective public safety outreach.

WMP AFN Functional Needs Customer Support:
Engagement efforts conducted in 2023 in support of this program include:
1. E&O Strategy | Developed and implemented a strategy to further engage CBOs in order to generate and track direct programs enrollments related to CARE, FERA, ESA, AMP, and MBL. (includes use of source codes)
2. Internal Alignment | Aligned with internal teams to support new initiatives through CBOs.
3. CBO Engagement| Enhanced the use of CBO profiles to better understand key areas of support, including demographics reached and areas served.
4. External Partnerships | Leveraged partnerships with external Stakeholders to implement large-scale company initiatives including the Cool Zone Program and Wildfire Safety Fairs.
5. PSPS Support | Increased visibility of PSPS customer notifications through select CBOs reaching customers with AFN and those located in the HFTD.

In 2023, there were 112 formal engagements with tribal stakeholders including working groups, workshops, summits, conferences, cultural event participation, fairs, and other forms of support; these events all had either topical or direct ties to information dissemination about wildfire safety, wildfire prevention, and/or information about critical resources forecasted to be impacted by wildfire events. Additional critical use of funding for the labor of this team included partnerships with the Indian Health Council, Southern Indian Health Council, Southern California Emergency Managers Association, Southern California Tribal Chairmen's Association, and The Intertribal Long Term Recovery Foundation.

ENS Enhancement WMP & ENS Operation Megaphone:
Key stakeholders involved in the Emergency Notification System project included both external and internal groups. The primary external stakeholders were customers, who benefited from continued access to reliable communications during emergency events. Internally, the legacy project engaged the Emergency Management department, responsible for overseeing preparedness and response operations; the Customer Success department, which focused on customer needs and experience; and the Regulatory Affairs department, which provided guidance to maintain compliance with CPUC requirements and industry best practices. Additionally, coordination extended to subject matter experts, IT, and Communications staff to integrate technical solutions and support effective public safety outreach.

PSPP All Hazards & K2:
SDG&E's Public Safety Partner Portal was developed through sustained engagement with both external public safety partners and internal SDG&E staff, using a feedback loop that directly informed solution scope and communications practices for wildfire preparedness and response. SDG&E established a structured focus group of emergency managers representing multiple sectors (including local, state, tribal, telecommunications, and water/wastewater) to determine the best way to provide Public Safety Partners the information needed for emergency planning, response, and recovery, and inform Portal functionality supporting wildfire operations. The focus group process was explicitly described as "invaluable" for surfacing comments, concerns, ideas, and questions. The focus group input translated into concrete product decisions. In parallel, the project team engaged internal SDG&E stakeholders via interviews, workshops, and leadership touchpoints with program materials describing internal SME interviews and service design workshops (and associated change management and training strategy) to provide the Portal support wildfire preparedness and response, emergency operations, contact management, and communication workflows. Stakeholder communications were informed by documented research on partner communication preferences and the need for clear, actionable, and reliable information, and the solution incorporated portal-based communication capabilities such as templated notifications, communication logs, and delivery/open metrics to support timely outreach and auditable reporting needs.

Public Safety Partner Portal Enhancement: Not applicable as these were trailing charges from 2022.

PSPP Mobile App:
The PSPP Mobile App project leveraged the stakeholder engagement and focus group feedback described in the All Hazards & K2 Modernization project. Most notably, the focus group process gave SDG&E the opportunity to hear Public Safety Partner feedback firsthand and directly address their communication needs. Specifically, the mobile application was created in response to the focus group request to improve in-field access and enable notification customization (including push notifications and the ability to "follow" communities).

Metrics:

PSPS Communication Practices:
SDG&E measured the effectiveness of its Wildfire Safety and PSPS public education campaigns and customer notifications using a combination of reach-based metrics and customer research insights. Campaign and notification performance was assessed through reach indicators, such as the number of people exposed to campaign elements or who received PSPS notifications, providing a foundational measure of audience exposure. In parallel, annual customer research was conducted to solicit direct feedback on campaign and notification messaging, with a focus on evaluating performance, recall, and comprehension of key safety messages.
In 2023, SDG&E solicited customer feedback to evaluate the effectiveness of its PSPS public education and communications efforts. This research was conducted in partnership with the company's research contractor of record and gathered customer input on both paid public education campaign tactics and messaging, as well as PSPS notification content delivered before, during, and after PSPS events. These feedback mechanisms supported a data driven approach to understanding customer awareness, comprehension, and perceived usefulness of PSPS communications.

These metrics and research findings were reviewed and analyzed on an annual basis and incorporated into SDG&E's continuous improvement cycle. Results were used to refine media strategies, improve message clarity, and enhance overall campaign reach and effectiveness. This data-driven approach aligned with CPUC requirements to evaluate education and outreach effectiveness and reflected best practices for customer-centered public safety communications, supporting an improved and more consistent customer experience year over year.

WMP AFN Functional Needs Customer Support:
Raw KPI data for Positive Customer Feedback Data, (100% reflecting full satisfaction with support service):
- Portable Battery Program: 100%
- Generator Grant Program: 86%
- Medical Baseline Program: 75%
- Call 211: 75%

The Tribal Relations team strove to engage in building resiliency against wildfire risks for all federally and non-federally recognized Tribes in its service area. To track annual success, event information was collected (with the consent of participants) including attendance, RSVPs, number of events, CBO partners, and more. To evaluate the success of engagement and unmet needs, the Tribal Relations team invited and hosted a focus group for southern Californian tribes at the midpoint of the year. This focus group, along with regular meetings with Tribal Councils, gave the team targeted feedback on the ongoing success of the program. In collaboration with this team, surveys were also conducted by the company for the success of general wildfire mitigation efforts of PSPS, a survey about the experience of specific PSPS events, and surveys of the success of PSPS exercises; all three included the tribal stakeholders supported by the Tribal Relations team. Each of these evaluations determined overall support of the team's strategy for engagement and for creating strong pathways for trusted reciprocal relationships with the tribal partners and SDG&E.

ENS Enhancement WMP & ENS Operation Megaphone:
The main metric for this project was the doubling of the system capacity from 50,000 notifications an hour to 100,000, completed by August. The need to double the notifications capability was a significant driver in justifying this work given the operational risk of a PSPS event impacting more than 50,000 customers. While the one PSPS event in 2023 had less than 2000 customers in scope, in January of 2025, during one PSPS event there were multiple instances of greater than 130,000 notifications needing to be sent at one time.

Additional qualitative and operational indicators included reductions in manual effort required to execute notifications and reporting, improved system stability during production events, and enhancements to the ENS user interface to support clearer workflows and operator effectiveness during emergency operations. Collectively, these metrics demonstrated that the ENS enhancements materially improved reliability, compliance readiness, and operational efficiency while the platform remained in service. Experienced EOC staff reported that since the completion of the user interface enhancement that additional staff were able to be quickly added to perform notification efforts and reporting from the ENS was able to be accessed and reported on in a much quicker turn around.

PSPP All Hazards & K2:
To measure success, SDG&E tracked both design validation metrics and operational performance outcomes aligned with the program's objectives to improve partner adoption, engagement, and reliability of emergency communications.
In support of the goal to increase user adoption, retention, and engagement, and to support the A2B phase of the project, the team successfully conducted 17 interviews with 5 Public Safety Partners and 12 SDG&E employees, received an additional 5 survey responses from Public Safety Partners, and completed 7 weeks of research and synthesis to inform ideation and strategy to define and validate a minimum viable product for enhancements. These activities served as leading indicators that requirements were grounded in partner and operational needs related to wildfire response and PSPS execution. Following implementation, the number of unique Partner Portal visitors during PSPS events has increased annually from 159 in 2023, to 469 in 2024, to 638 in 2025, showing a sustained growth in partner usage over time. The Partner Portal also received the Silver Award from the California Emergency Services Association's Southern Chapter in 2023 after nomination by a local emergency manager for "pushing the needle forward on our jurisdiction's preparedness". This level of recognition by local peers validated the direction of the Public Safety Partner Portal and reinforced the value-add of the wildfire-related enhancements to the preparedness of our Public Safety Partners.
In support of the goal to improve notification reliability, SDG&E tracked delivery performance following deployment of the Partner Portal notification functionality. From 2023 through 2025, SDG&E reported zero failed Public Safety Partner notifications across five PSPS events, indicating that the system met its operational reliability objective during emergency conditions.

Public Safety Partner Portal Enhancement: Not applicable as these were trailing charges from 2022.

PSPP Mobile App:
As an extension of functionality of the All Hazards & K2 Modernization program, the PSPP Mobile App informed the design validation metrics and operational performance outcomes measuring the success of the program's objectives to improve partner adoption, engagement, and reliability of emergency communications.

AFN Metrics:

KPI	2023 Data	Measurement Mechanism
Total outreach activities (events, meetings, presentations, & monthly	5,000	Total Activity Count
Activities focused on Medical Baseline Program Outreach	1,000	Medical Baseline Activity Count
Total Outreach Events	300	Total Event Count
Enrollments for CARE Program (ESP + CARE Caps)	300	Care Enrollment Count
Enrollments for FERA Program (ESP + CARE Caps)	25	FERA Enrollment Count
Increase and strengthen CBO representation of customers with AFN	10	New AFN Partners added to portfolio
Increase awareness of critical SDG&E initiatives for CBO	3	Company-hosted webinars focused on key initiatives (e.g. Resiliency, Customer Protections)

Utility Benchmarking:

PSPS Communication Practices:
SDG&E collaborated closely with the other California electric investor owned utilities (Joint IOUs) to align on campaign development, PSPS notification messaging, and customer research methodologies. This coordination supported consistency in how PSPS concepts were communicated statewide and helped reduce customer confusion across utility service territories.

WMP AFN Functional Needs Customer Support:
To support individuals with AFN during PSPS, each of the Joint IOUs developed respective 2023 Annual AFN PSPS Plan with assistance from regional and statewide AFN stakeholders, representing a broad spectrum of expertise. The Plan leveraged the Six-Step Planning Process outlined in the Federal Emergency Management Agency (FEMA) Developing and Maintaining Emergency Operations Plans Comprehensive Preparedness Guide 101. The Joint IOUs were committed to addressing the needs of individuals with AFN before, during, and after a PSPS. The Joint IOUs established a partnership with the AFN Collaborative Council and the Joint IOU Statewide AFN Advisory Council to seek guidance and address critical information gathering strategies needed to mitigate risk and support individuals with AFN. Throughout this work, the Joint IOUs remained consistent in their support-partner offerings, maintaining aligned approaches and shared practices across utilities provide equitable access to resources, community engagement, and AFN-related services.
The Tribal Relations team regularly met with regional utility counterparts; this included alignment and action review committees with PG&E and Southern California Edison. A particularly successful annual collaboration was the execution of the Tribal Leaders' Energy Summit, a joint utility run conference that engaged Tribes California wide to discuss current priorities, challenges, and critical risk mitigation efforts for wildfire prevention and response.

ENS Enhancement WMP & ENS Operation Megaphone:
At the time of the development of the ENS system, no other utility was conducting PSPS notifications. As other utilities and rulemaking evolved to create greater standardization among utility PSPS practices, SDG&E participated in other California IOU joint utility coordination sessions.

PSPP All Hazards & K2:
Stakeholder interviews established that PSPS processes and regulatory requirements had become the standard that the CPUC and Public Safety Partners expected to apply to wildfire communications and preparedness.
CPUC requirements for investor-owned utilities to provide a Public Safety Partner Portal informed the compliance driven nature of the program, and SDG&E participated in scheduled joint IOU meetings where utilities discussed their respective approaches to meeting this requirement.

Public Safety Partner Portal Enhancement:
Through structured partner interviews, focus groups, and research sessions conducted during the All-Hazards and K2 Discovery phases, SDG&E gathered feedback from a broad cross-section of utilities and public agencies to understand best practices for emergency communications, data transparency, and portal usability.

PSPP Mobile App:
The PSPP Mobile App project leveraged the lessons learned and internal and external benchmarking and that informed the All Hazards and K2 Modernization Program approach, emphasizing strengthening wildfire communications capabilities. Regulatory and industry dialogue helped confirm the direction of the mobile app. During a CPUC workshop, a CPUC representative referenced SDG&E's Public Safety Partner mobile application in a discussion of partner communication approaches with another utility, which reinforced that prioritizing multi-channel and accessibility for wildfire and PSPS events was consistent with emerging regulatory expectations.

Pictures:

N/A

Workpaper	Emergency Preparedness
Category	Aviation
WMP Tracking ID	WMP.557

Description	**Aviation**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	12	21	329	466
Capital Expenditures Non-Labor	-	7,134	12,785	11,123	2,974
Capital Expenditures Direct Costs Subtotal	**-**	**7,145**	**12,806**	**11,452**	**3,440**
Capital Expenditures Indirect Costs	-	548	1,208	2,738	1,226
Capital Total	**-**	**7,693**	**14,014**	**14,191**	**4,667**
O&M Labor	(0)	0	1	0	10
O&M Non-Labor	3,859	6,748	6,850	7,396	8,005
O&M Direct Costs Subtotal	**3,859**	**6,748**	**6,851**	**7,397**	**8,016**
O&M Indirect Costs	(0)	0	7	5	7
O&M Total	**3,858**	**6,748**	**6,858**	**7,402**	**8,023**
Units					
	The variety of work activities in this category makes it infeasible to identify a single unit of measurement.				
FTE*	(0.0)	0.1	0.2	2.6	**3.6**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					7,389

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Aviation Firefighting Program					
Capital	**-**	**7,145**	**10,620**	**849**	**102**
Labor	-	12	18	1	0
Non-Labor	-	7,134	10,602	849	102
O&M	**3,859**	**6,748**	**6,851**	**7,397**	**8,001**
Labor	(0)	0	1	0	0
Non-Labor	3,859	6,748	6,850	7,396	8,001
Aviation Firefighting Program Total	**3,859**	**13,893**	**17,471**	**8,246**	**8,103**
Aviation Training Area					
Capital	**-**	**-**	**-**	**5**	**1,006**
Labor	-	-	-	0	45
Non-Labor	-	-	-	5	961
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Aviation Training Area Total	**-**	**-**	**-**	**5**	**1,006**
Twin Engine Medium Lift Helicopter					
Capital	**-**	**-**	**2,186**	**9,560**	**1,139**
Labor	-	-	4	17	1
Non-Labor	-	-	2,182	9,543	1,139
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Twin Engine Medium Lift Helicopter Total	**-**	**-**	**2,186**	**9,560**	**1,139**
Aviation Crossing Markers					
Capital	**-**	**-**	**-**	**1,038**	**1,193**
Labor	-	-	-	311	420
Non-Labor	-	-	-	727	773
O&M	**-**	**-**	**-**	**-**	**14**
Labor	-	-	-	-	10
Non-Labor	-	-	-	-	4
Aviation Crossing Markers Total	**-**	**-**	**-**	**1,038**	**1,207**
Total	**3,859**	**13,893**	**19,657**	**18,849**	**11,456**

Business Purpose:

Aviation Firefighting Program:
SDG&E's aerial firefighting helicopters provided essential year-round construction support in hard-to-access and rugged areas of the service territory, enabling safe and efficient installation, repair, and hardening of electric infrastructure where ground access is limited or infeasible. These same high-capability aircraft were immediately available for rapid wildfire suppression, allowing early attack to keep fires small and limit impacts. While SDG&E relied on public fire agencies, seasonal reductions in available aerial resources could have delayed response times. For continuous operational and suppression capability, SDG&E has maintained two Type 1 helicopters—each capable of delivering more than 700 gallons—ready for dispatch 365 days per year. Spend associated with this work was primarily charged to O&M.

Aviation Training Area:
The purchase of land that is accessible but remote acted as a practice area for both helicopters and drones providing safe operations. Practice in a controlled environment helped to reduce risk of these flights and was a necessary capital spend to maintain safety and reduce risk to crews flying within its service territory.

Twin Engine Medium Lift Helicopter:
SDG&E purchased the Bell 412 EPX Helicopter in 2021 to conduct medium lift operations such as carrying heavy poles with configured equipment. Prior to this purchase, in order to conduct this sort of medium lift work, SDG&E had to either take a firefighting helicopter out of service or attempt to lease medium lift capability. In 2023 hoist capability was added to allow for safer operations to conduct Human External Cargo (HEC) work. The FAA defines HEC as "A person(s) that at some point in the operation is carried external to the rotorcraft" (FAA Advisory Circular 133-1B). This enhanced access to structures that were required to be inspected or serviced but were difficult to reach by allowing crews to be lowered from a helicopter without the need for a nearby landing zone. Safety of crews and efficiency of work, especially within the HFTD where the terrain often requires this sort of work, were attained with capital enhancements to this helicopter.

Aviation Crossing Markers:
SDG&E performed multiple patrols of lines. These lines often intersected causing obstacles for helicopters. Crossing markers were installed alerting helicopter crews of these crossings so pilot action can be taken.

Project Justification:

Aviation programs were set up to support the continual effort of a safe, reliable and operational systems. The Aviation Firefighting Program is a protection of the infrastructure, the Aviation Training Area promotes training and safety of those instructed to work on the system, Twin Engine Medium Lift Helicopter hoist operations and another work method to maintain the system, and Aviation Crossing Markers are necessary for situational awareness while patrolling the system safely.

Aviation Firefighting Program:
During wildfires outside of SDG&E's service territory, fire agencies could divert local aerial resources to fight these wildfires, leaving the service territory with limited or no aerial firefighting resources. The Aviation Firefighting Program focused on reducing the consequences of wildfires through suppression of fire spread and allowed aerial firefighting resources to remain available in the region. These resources were available to the entire community regardless of the cause of ignition. SDG&E had agreements with the County of San Diego, CAL FIRE, and the Orange County Fire Authority for aerial firefighting within the service territory. Dispatch of aviation firefighting assets was performed through CAL FIRE, and these assets supported the initial attack strategy to contain wildfires to less than 10 acres. To assist in dispatching aerial assets 365 days per year throughout the service territory, SDG&E employed flight operations staff. This allowed the assets to be launched rapidly once dispatched by CAL FIRE. The Flight Operations Base also had oversight and scheduling of a training area that was purchased. This training area served as a risk reducer for helicopter by providing a controlled environment for training and research and development.

Aviation Training Area:
Continuous aviation work requires helicopter pilots and ground crews to have additional training in a controlled environment to be safety and efficient when conducting helicopter work in the field. Due to perishable skills of helicopter work, training in a controlled environment reduces errors in the field. Additionally, most of the aviation work is done in the HFTD where errors will be compounded by fire.

Twin Engine Medium Lift Helicopter:
The primary reason for the hoist capabilities to the Bell 412 EPX were to allow for crews to be lowered from the helicopters to conduct Human External Cargo (HEC) work in remote areas. Without this capability, crews are attached to a helicopter at a landing zone and are flown with Human External Cargo (HEC) hanging below the aircraft. FAA requirements dictate that helicopters cannot transport with anything hanging externally over freeways and SDG&E carries that same requirement to not fly with HEC over transmission lines. Additionally, to ensure personnel safety, there is a 15 minute cap for the length of these flights with someone hanging externally. Prior to this hoist, personnel would have to be attached at a landing zone and the entire flight could not last longer than 15 minutes nor could it go over any freeways or transmission lines. Conducting operations this way can be very inefficient if there are few landing zones nearby. Additional benefits of this capability are as a rescue option when workers are inspecting electrical structures throughout the service territory. The majority of these structures are in isolated hard to access areas. Regardless of climbing the structure or using a Human External Cargo (HEC) work method, if a worker is seriously injured on top of the structure, the fastest way to move the worker would be from a hoist on a helicopters. Public agencies will not access a wires environment victim- this is where SDG&E trained its personnel to provide this method of removal from the structure was made available. Other benefits of this hoist capability involve the ability to bring in additional equipment for work in very remote areas.

Aviation Crossing Markers:
These markers are for defining wire crossings. When a helicopter patrols electric lines, the crew is "in-the-wires" which means extremely close to wires to be able to see the infrastructure. These markers were installed on lines indicating to pilots and patrolmen that a crossing of another wire was ahead. This would give enough distance for the pilot to elevate and flyover the crossing. Without these markers, these crossings would not necessarily be seen and would cause a helicopter to run into wires resulting in an accident. The majority of patrols are in fire prone areas (HFTD).

Project Scope:

Aviation Firefighting Program:
Two firefighting helicopters, an Erickson S-64 helitanker and a Sikorsky Utility Helicopter (UH)-60 Blackhawk helitanker, were leased and made available. Both firefighting assets were Type 1 firefighting helicopters, defined as carrying over 700 gallons of water to fight fires. The Air Crane had the capability of dropping up to 2,650 gallons of water, and the Blackhawk had the capability of dropping up to 850 gallons of water. Additionally, the Blackhawk hardware was configured for night vision device flight and was capable of night firefighting with the appropriate crew, training, and CAL FIRE support. The decision for these two resources was based on their exceptional fire suppression capability and ability to perform as a construction tool in areas with access issues. To support this scope, Flight Operations Base personnel were properly trained to dispatch these firefighting helicopters.
Aviation Training Area:
For aviation operations, land purchase allowed training and development for both helicopters and drones. This area provided a controlled environment for these aviation activities. The scope for the aviation training area was to purchase property that met the requirements and properly prepare for operations.
Twin Engine Medium Lift Helicopter:
The scope for the Bell 412 EPX was to have a local outfitter install a hoist system and associated equipment for hoist operations. This work was completed at a company located in Carlsbad CA.
Aviation Crossing Markers:
The crossing markers were installed at the appropriate locations- first indicator is yellow and is set 2-4 spans before the crossing, the final indicator is red which is 1 span prior. Crossings were defined by patrol crews.

Cost Drivers:

Aviation Firefighting Program:
O&M costs within the Aviation Firefighting Program cost category were for the maintenance, piloting, and support of the two helicopters. O&M costs also were incurred for Flight Operations Base personnel to enable 365-day coverage for dispatch.
Aviation Training Area:
Capital costs within the Aviation Training Area cost category were incurred for the purchase of the Aviation Training Area land and subsequent improvements for use.
Twin Engine Medium Lift Helicopter:
Capital costs were incurred for the installation of the hoist system in the Bell 412 EPX within the Twin Engine Medium Lift Helicopter cost category.
Aviation Crossing Markers:
Capital costs were incurred for the labor and materials to install the aviation crossing markers.

Project Timing and Phases:

Aviation Firefighting Program:
The O&M costs maintained the helicopters for 365-day alert to fight fires. O&M was spent to provide personnel with available at the Flight Operations Base supporting all helicopter flights.
Aviation Training Area:
Land was purchased in August 2023 after a lengthy selection process which involved multiple locations being assessed. Improvements were started for training needs, security, and fire defensible space.
Twin Engine Medium Lift Helicopter:
The Bell 412 EPX was received in early 2023. Capital funds were used to outfit the Bell 412 EPX with a hoist and associated equipment.
Aviation Crossing Markers:
Crossing markers installed throughout the year in conjunction with other work.

Approval Process/Procurement Process:

These programs were approved in accordance with SDG&E's Approval and Commitment Policy.

Aviation Firefighting Program:
Internal governance required coordination with the Aviation Services Department and compliance with Federal Aviation Administration and SDG&E aviation policies.
Aviation Training Area:
Land purchase approved once selection completed through Real Estate.
Twin Engine Medium Lift Helicopter:
As part of the initial capital for the Bell 412 EPX,, installation was approved through a local vendor that met internal procurement requirements. This vendor is licensed and approved for this work and equipment installation carried the appropriate warranties and testing to ensure safe operations.
Aviation Crossing Markers:
Aviation resources were acquired using qualified and vetted vendors that met regulatory, safety, and operational requirements, ensuring transparency, fairness, and operational reliability.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.1.8.3.3. This program does not have specified targets. Planned Capital spend was $7,960,000. Planned O&M spend was $9,326,000.

Risk Identification and Mitigation:

Aviation Firefighting Program:
The Aviation Firefighting Program (WMP.557) faced operational, safety, regulatory, and financial risks that were actively managed through established aviation governance and compliance processes. Operational risks included asset unavailability and reduced firefighting effectiveness under adverse conditions; SDG&E mitigated these risks through year-round dispatch readiness supported by flight operations staffing and CAL FIRE dispatch coordination, and by continuing to evaluate program effectiveness using internal and external data. Safety risks (including potential aviation incidents) were mitigated through ASD-controlled vendor qualification and FAA-compliant operating procedures, and through training and proficiency investments (including the aviation training area), and a trained and qualified flight operations base intended to reduce aviation operations incident risk.

Aviation Training Area:
Location of the training area needed additional scrutiny for the type of operations that were to be conducted in the area. Good neighbor policy created flight patterns that allowed flight away from adjoining properties. Additionally, SDG&E partnered with the County of San Diego to create a future understanding of use- allowing outside agencies to use the are for training when SDG&E was not using it.

Twin Engine Medium Lift Helicopter:
Risks identified were in line with what could be done in the rescue environment if the hoist was not installed. Once the installation was completed, training and operational procedures were created enabling proper use.

Aviation Crossing Markers: Minimal risks- these markers were for identifying hazards to flight.

Consideration of Alternative Solutions:

Aviation Firefighting Program:
SDG&E evaluated several alternatives to meet the need for wildfire suppression capability and construction support in hard to access areas of its service territory.
Do Nothing:
Under this alternative, SDG&E would have relied exclusively on public fire agencies for aerial firefighting. While agencies provided essential response services, their aircraft availability varied seasonally and could be diverted outside the service territory during concurrent regional fire events. As documented in the WMP, delayed suppression increased the risk of fires growing rapidly and uncontrollably. SDG&E observed that more water was dropped with SDG&E supplied resources outside of the traditional fire season than during it.
Seasonal or Call When Needed:
This option would have used seasonal contracts or call when needed aircraft during peak fire season. This option offered minimal support outside the defined fire season. It also did not support year round construction and infrastructure work in areas with limited ground access. This alternative was determined to provide insufficient operational control and risk reduction and the cost was excessive- year round total daily costs were contracted at roughly $6,600 versus a 4 month option that would charge roughly $19,100. This radical increase was to guarantee pilots and helicopter were available for the shorter time window- short time windows still need to accommodate crew and machine year round. SDG&E observed that more water was dropped with SDG&E supplied resources outside of the traditional fire season than during it.
Fixed Wing Aircraft Only:
Fixed wing aircraft were effective for large scale retardant drops but were less suitable for rapid initial attack in rugged or confined terrain and could not support construction activities. SDG&E did not operate fixed wing aircraft for other operations and costs were greater.
Lower Capacity Helicopters:
Smaller helicopters were considered but offered reduced water drop capacity and limited lift capability, requiring more flights to achieve similar suppression outcomes and restricting construction utility. This reduced operational efficiency and overall risk reduction effectiveness.
Selected Approach – Two Company Controlled Type 1 Helicopters:
SDG&E selected the approach of maintaining two Type 1 helicopters available for dispatch 365 days per year. As documented in the WMP, these assets were chosen for their exceptional fire suppression capability and their ability to perform as construction tools in areas with access constraints. Maintaining company controlled assets with immediate availability, supported rapid initial attack to keep fires small, and provided year round construction support in remote terrain. This approach offered the greatest combined operational value and wildfire risk reduction relative to the alternatives evaluated.

Aviation Training Area:
Do Nothing:
SDG&E determined that this allowed unreasonable risk in helicopter operations
Purchase:
The Real Estate team evaluated multiple areas that could have met the criteria. Initial assessments to include cost were used assisting with meeting all requirements. The selected property had preexisting landing areas that required minimum work to upgrade, appropriate area to avoid any overflight of population yet easily reach on the ground for ground training personnel.

Twin Engine Medium Lift Helicopter:
Lease units:
This option would require investment in a vendor's helicopter to add the hoist. The cost prohibitive nature of this is SDG&E's requirement for a twin engine to have any Human External Cargo (HEC) work assigned. Vendors supplying twin engine helicopters ask a premium for the contract of these machines and paying them for enhancements was deemed inappropriate.
No action:
This option would leave a deficiency in any emergency evacuation of an injury in the wire environment. While lowering with ropes systems is possible, the time to move the injured down and to an area for pickup would be excessive when immediate care was required.
Install locally: purchase of the hoist and the associated equipment was deemed the best case- ownership, SDG&E choice of installer (local), and warranties for the equipment for a long life. This option reduces the circumstances where HEC was viable, this would result in personnel having to hike into remote areas both exposing them to several risks and lengthening response and restoration time.

Aviation Crossing Markers:
No action:
Deemed inappropriate since hazard was identified and needed to be mitigate. Installations were completed by internal labor.

Coordination with Similar Programs

Aviation Firefighting Program:
The firefighting program was developed with input from CAL FIRE and the County of San Diego Fire Authority. The assessment was started years prior when assets in the County of San Diego were moved to fight fires north of the County. Once assigned to other fires, these assets were not returned until released from those fires. Fires that started in San Diego County did not have aviation elements or substantial assets to fight fires. SDG&E conferred with CAL FIRE and started an initial program of a seasonal asset. This program was scaled appropriately with CAL FIRE input to become a year round asset with a second asset joining the 365 per year program. The assigned helicopters were also heavy construction helicopters but when assigned that work they were temporarily removed from the firefighting role and costs invoiced to the business unit receiving the work.
Aviation Training Area:
SDG&E used several small areas over the years and conferred with SoCal Edison and PG&E to assess what they were using and how they were using those areas. Tailoring SDG&E needs to what was learned from the other IOUs was the foundation for the SDG&E Aviation Training Area.
Twin Engine Medium Lift Helicopter:
With the maturation of the Human External Cargo (HEC) program, rescue options were benchmarked with the other IOUs and Arizona's Salt Water Project. The experience gained from these other programs were instrumental in identifying hazards and mitigating them in the HEC program. The hoist was a logical step in risk mitigation and response for emergencies.
Aviation Crossing Markers:
SDG&E conferred with the other IOUs and nation-wide with other utilities- crossing markers are a standardized item used throughout the industry. Risk mitigation for the most dangerous flights conducted in the SDG&E service territory was done through these The Aviation Firefighting Program was intentionally structured to complement, rather than duplicate existing wildfire response and construction programs through formal coordination with internal SDG&E functions and external public safety partners.

Coordination with Public Fire Agencies
SDG&E's aviation firefighting assets were integrated into the regional wildfire response framework and were dispatched through CAL FIRE, providing alignment with the established Incident Command System and avoiding parallel or duplicative suppression efforts. The program was designed to supplement public agency capacity when regional aerial resources were constrained or diverted, while remaining available to the broader community regardless of ignition source. Multi-agency coordination with CAL FIRE and other regional partners assisted SDG&E's aircraft filled capability gaps rather than replicated existing resources.

Internal Emergency Management and Fire Coordination Integration
Within SDG&E, the Aviation Firefighting Program operated under the Emergency Management framework and was coordinated through the Fire Coordination Team, which served as the primary interface with public safety agencies and internal operations. This structure provided aviation assets to be deployed only when appropriate, based on fire conditions, availability of external resources, and operational priorities, thereby preventing overlap with other suppression or ignition prevention programs.

Alignment with Construction and Operations Programs
Aviation assets were managed centrally through the Aviation Services Division, which oversaw all helicopter operations supporting construction, maintenance, inspections, and firefighting. This centralized governance prevented individual business units from procuring or operating separate aviation resources for similar purposes. By using the same aircraft for both wildfire suppression and construction support in hard-to-access areas, SDG&E avoided redundant aviation contracts while maximizing asset utilization.

Coordination with Other Wildfire Mitigation Initiatives
The Aviation Firefighting Program was coordinated with other wildfire mitigation activities, including contract fire resources, weather forecasting, and operational restrictions during elevated fire conditions. Decision-making protocols required coordination among Fire Coordination, Aviation Services, and Emergency Management to determine when aviation assets were needed versus when other mitigation measures were sufficient, providing layered risk reduction without duplicative spending.

Outcome
Through formal dispatch coordination with CAL FIRE, centralized internal aviation governance, and integration with Emergency Management and construction programs, SDG&E enabled its Aviation Firefighting Program complemented existing capabilities, addressed identified gaps, and avoided redundant resources while delivering both wildfire suppression and operational value.

Stakeholder Impact and Engagement:

Aviation Firefighting Program:
The Aviation Firefighting Program directly supports public safety agencies and benefits communities, customers, and vulnerable populations by improving regional wildfire suppression capability. Through formal coordination with CAL FIRE and other first responders, dedicated Fire Coordinator engagement, and ongoing community and public facing communications, SDG&E keeps stakeholders informed, aligned, and supported while avoiding duplication of existing response resources. SDG&E has seen and recorded more water drops on fires outside of the traditional fire season (September-November) showing the need for a dedicated year round aerial firefighting asset.

Aviation Training Area:
With the purchase, immediate use for evaluation of pilots, test flights of new drones, and ground training for lineman commenced. The use of the area has allowed training in a controlled environment enabling safety in the field- from tailboard to debrief- the area has set the precedence for safe and efficient operations. Interest from local agencies has started an assessment of what else the area can contribute for the County as a whole.

Twin Engine Medium Lift Helicopter:
With the installation of the hoist, the helicopter has been ready to assist in evacuating personnel from the wires environment, assisting injured personnel with getting the right facility for care.

Aviation Crossing Markers:
Helicopter patrolling has many hazards and with these crossing markers installed, pilots and patrolmen will know what is coming up in their patrol flights, giving the pilot opportunity to avoid crossing circuits.

Metrics:

See Table below.

Program	Metric/	Measurement Approach	Outcome
Year-round Availability of Aerial Firefighting Assets	Aircraft availability for dispatch 365 days per year to support rapid initial attack and construction missions.	Availability was tracked as readiness of designated Type 1 helicopters for immediate dispatch through CAL FIRE.	The program was explicitly designed to maintain two Type 1 helicopters available year-round, ensuring continuous readiness independent of seasonal staffing variations at public agencies. This criterion was achieved by design, as maintaining availability—not utilization—was the primary performance objective.
Rapid Initial Attack Capability	Ability to support early suppression to keep fires small and limit spread.	Integration with CAL FIRE dispatch and deployment under the Incident Command System; qualitative assessment of early attack capability rather than a numeric response time target.	The Aviation Firefighting Program was dispatched through CAL FIRE and integrated into the regional response framework, directly supporting rapid initial attack when local or regional aerial resources were constrained. The WMP documented this as the core purpose of the program, indicating that the criterion was met.
Support for Construction in Hard to Access Areas	Ability to provide aerial lift and access for construction, maintenance, and infrastructure hardening in terrain where ground access is limited or infeasible.	Operational use of aviation assets for construction support as a planned, ongoing function of the program.	Aircraft selection was explicitly based on their dual mission capability, including construction use in areas with access constraints. This capability was achieved, as documented in the WMP rationale for asset selection of mission capability, including construction use in areas with access constraints.
Avoidance of Redundancy and Effective Coordination	Demonstrated coordination with public fire agencies and internal programs to avoid duplicative resources.	Dispatch through CAL FIRE; coordination via SDG&E Fire Coordination and Emergency Management functions; participation in joint planning, training, and regional response activities.	The program operated as part of the regional aerial firefighting strategy and complemented—not duplicated—public agency resources. Coordination mechanisms were documented in WMP and Emergency Management materials, indicating that this criterion was met.

Utility Benchmarking:

Internal SDG&E Benchmarks

Prior to the SDG&E Aviation Firefighting Program (Pre2023)

The Aviation Firefighting Program built on SDG&E's longstanding use of aerial firefighting assets documented in prior Wildfire Mitigation Plans. Earlier program experience demonstrated that dedicated Type 1 helicopters provided effective early suppression and were uniquely suited to SDG&E's rugged terrain. Asset selection for the program explicitly reflected lessons learned from prior deployments, including the value of high-capacity drops and the ability to support construction in areas with access constraints. These lessons directly informed the decision to continue and formalize year-round Type 1 helicopter capability.

Fire Coordination and Emergency Management Programs

SDG&E's Fire Coordinator program—established in the early 2000s and continuously expanded—provided a key internal benchmark for interagency coordination and wildfire preparedness. Lessons learned from years of joint drills, real-world incidents, and 24/7 coordination with public safety partners informed the aviation program's integration into the Incident Command System and dispatch through CAL FIRE. This experience reinforced that aviation resources were most effective when embedded within existing emergency management and coordination structures rather than operated independently.

Industry and Regional Benchmarking

SDG&E benchmarked its approach against regional best practices that emphasize combined, multiagency aerial firefighting strategies rather than standalone utility response. Public documentation highlights SDG&E's coordination with CAL FIRE, local fire departments, federal land managers, and law enforcement as part of a unified regional aerial firefighting capability. SDG&E benchmarked its approach against regional best practices that emphasized combined, multi-agency aerial firefighting strategies rather than standalone utility response. Public documentation highlighted SDG&E's coordination with CAL FIRE, local fire departments, federal land managers, and law enforcement as part of a unified regional aerial firefighting capability. This model mirrored broader California and Western U.S. practices in which utilities supplemented—but did not replace—public agency aviation resources to address gaps during high-demand periods. Public documentation highlighted SDG&E's coordination with CAL FIRE, local fire departments, federal land managers, and law enforcement as part of a unified regional aerial firefighting capability.

Dual Mission Aviation Assets

Industry experience had shown that helicopters providing both wildfire suppression and construction support offered greater overall value than single-purpose assets. SDG&E's program reflected this benchmarking by selecting aircraft capable of high-capacity firefighting while also supporting infrastructure construction and hardening in remote terrain. This dual-use approach aligned with practices used by other utilities and infrastructure operators working in mountainous or access-constrained regions.

Pictures:

N/A

Workpaper	Emergency Preparedness
Category	Suppression Resources and Services
WMP Tracking ID	WMP.514

Description	**Suppression Resources and Services**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	-	-	-	-	-
Capital Expenditures Non-Labor	-	-	-	-	-
Capital Expenditures Direct Costs Subtotal	**-**	**-**	**-**	**-**	**-**
Capital Expenditures Indirect Costs	-	-	-	-	-
Capital Total	**-**	**-**	**-**	**-**	**-**
O&M Labor	1	1	1	1	2
O&M Non-Labor	1,790	2,588	3,071	3,074	4,639
O&M Direct Costs Subtotal	**1,791**	**2,589**	**3,072**	**3,075**	**4,641**
O&M Indirect Costs	9	13	15	16	26
O&M Total	**1,799**	**2,601**	**3,087**	**3,091**	**4,667**
Units					
Units	The variety of work activities in this category makes it infeasible to identify a single unit of measurement.				
FTE*	0.0	0.0	0.0	0.0	**0.0**
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					2,688

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Suppression Resources and Services					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**1,791**	**2,589**	**3,072**	**3,075**	**4,641**
Labor	1	1	1	1	2
Non-Labor	1,790	2,588	3,071	3,074	4,639
Suppression Resources and Services Total	**1,791**	**2,589**	**3,072**	**3,075**	**4,641**

Business Purpose:

The primary purpose of this risk reduction initiative was to enhance wildfire prevention and mitigation efforts at worksites. This was achieved by implementing varying levels of wildfire prevention measures based on the Fire Potential Index (FPI) rating and the specific activities performed. The goal was to provide fire safe practices in adherence with SDG&E's Wildland Fire Prevention Plan (Engineering Standard Practice (ESP) 113.1), thereby reducing the risk of wildfires by assigning Contract Fire Resources (CFRs) as Dedicated Fire Patrols to monitor work activities decreasing the likelihood of an ignition expanding into a wildland fire of consequence with qualified firefighting personnel on-site. This program did not directly impact outage program risks, however, it further reduced the risk of a wildland ignition during PSPS activities when switching of the electrical system occurs.

Project Justification:

The project was justified by the need to proactively manage wildfire risks associated with work activities in the wildland areas. SDG&E deployed CFRs with the appropriate amount of training, water, and tools to meet the needs of the work activity to work sites to mitigate potential wildland fire ignitions. This was particularly important during periods of elevated fire risk, as indicated by the FPI. The requirement for CFRs, as indicated by SDG&E's Wildland Fire Prevention Plan (ESP 113.1), was implemented so that at-risk work activities did not contribute to wildfire incidents. Additionally, during Extreme Fire Potential periods when routine maintenance work was cancelled, CFRs were deployed to support emergency maintenance activities playing a crucial role in fire prevention during PSPS and forced outages.

Project Scope:

The initiative involved deploying qualified CFRs to worksites. These CFRs were staffed by personnel equipped with the necessary training, water, and tools to manage fire prevention and mitigation tasks. The staffing levels varied from 12 to 17 daily CFR crews, typically from June through November, aligning with elevated to extreme weather conditions as dictated by the FPI and the staffing of local, state, and federal agencies. CFRs are not limited to High Fire Threat Districts (HFTD) and were used for specific activities adjacent to wildland fuels when there was an elevated risk.

Cost Drivers:

CFR staffing levels were directed by the FPI daily rating, indicating the susceptibility of large fires, and the level of construction and operation activities. When the FPI reached elevated or extreme levels and utility crews were performing at risk activities, worksites that were determined to be in or adjacent to wildland areas required a Dedicated Fire Patrol in adherence to SDG&E's Wildland Fire Prevention Plan (ESP 113.1). This Dedicated Fire Patrol was fulfilled by a CFR that would accompany utility crews to monitor the at-risk work activity like heavy equipment operations or construction hot work (welding, cutting, grinding). During periods of normal FPI rating, contract fire resources staffing was “by request” and subject to review from SDG&E's Fire Science and Coordination team specialists. In 2023, the primary staffing period was activated on June 5th and ended November 10th. During this time, approximately 15 CFRs were staffed daily throughout the service area.

Project Timing and Phases:

Project level activities were related to seasonal fire weather conditions when SDG&E foresaw the need to maintain minimum CFR staffing levels in support of utility operations and activities to assist working utility crews with an adequate number of dedicated and qualified fire patrol teams. During periods of reduced or normal fire weather conditions, staffing levels were transitioned to “by request” from business units and were fulfilled only after review from SDG&E's Fire Science and Coordination team specialists identified a need for fire prevention controls. The CFR vendor contracts allow this flexibility of staffing levels year-round and support SDG&E's ability to rapidly increase CFR resources during periods of heightened fire weather concerns.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy.

SDG&E utilized a competitive bidding strategy in early 2023 for Wildfire Prevention Services. SDG&E received proposals from six companies and after a secondary review from a cross-functional team found only three companies met the required expertise and staffing ability to meet SDG&E’s requirements. SDG&E awarded the contract with a split strategy amongst the three qualified companies supporting competitive pricing and allowing multiple suppliers to support seasonal and emergency staffing levels.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.1.8.3.2. This program does not have specified targets.

Risk Identification and Mitigation:

Identified risks associated with the CFR program include difficulties in financial forecasting due to the variability of fire weather conditions and the need to maintain adequate staffing of qualified firefighters. The consequences of these risks included limited CFR crew availability work activities in wildland areas would be required to be cancelled or postponed.

The Wildland Fire Prevention Plan (ESP 113.1) and the service agreements with CFR vendors allow SDG&E flexibility to align seasonal wildland fire conditions with appropriate CFR staffing enabling program costs to be related to the measured risk mitigation requirements. To further mitigate impacts from seasonal variability and the need for rapid mobilization to support emergency operations, SDG&E has maintained service agreements from three separate vendors assisting resource needs with adequate staffing throughout the year.

Consideration of Alternative Solutions:

1. Do Nothing - To do nothing, would require removal of the specific SDG&E Wildland Fire Prevention Plan (ESP 113.1) requirements for Dedicated Fire Patrols, in conflict with the approved Wildfire Mitigation Plan, and accept the risk associated with the absence of on-site qualified firefighters, increasing the chance that potential ignitions could expand into a wildland fire of consequence while the local suppression agency responds. In addition, it would limit the ability to perform construction activities outlined in the WMP hindering the ability to resolve ignition risks. This alternative was an unacceptable safety and regulatory risk, and the strategy of contracting out Dedicated Fire Patrols to trained vendor resources was continued.

2. Rely on internal utility staff to serve as the Dedicated Fire Patrols requiring additional purchases of specific fire patrol vehicles and equipment, complete specialized qualified firefighting training and increase seasonal hiring efforts to mitigate pressures on staffing levels during major emergency events (such as PSPS). This was deemed too costly and not effective.

Coordination with Similar Programs

N/A

Stakeholder Impact and Engagement:

N/A

Metrics:

The primary staffing period had approximately averaged 15 crews per day for 113 week days, during the period between June 5th and November 10th. This enabled approximately 1,695 safe crew work days in wildland areas. The daily staffing cost of a CFR with 50% contingency (overtime, additional crews, contractor scheduling costs) is approximately $2,700. The metric of 1,695 safe crew work days at the cost of $2,700 per crew day ($4.576M) approaches the reflected costs of 2023 ($4.641M).

Staffing levels of CFRs are related to crew work activities, location of the work and seasonal fire risks and are intentionally variable to align with operational needs relevant to the susceptibility of a potential wildland fire. CFR personnel are trained and equipped to mitigate the consequences of a work site ignition but the overall response and suppression would be the responsibility by the fire agency having jurisdiction. A metric tracking the number of worksite ignitions or CFR responses to worksite ignitions implies the CFR program is responsible for the volume of at-risk work activities occurring in the wildland areas (the potential cause of the ignition) or the suppression response (the responsibility of fire agency having jurisdiction). The Wildland Fire Prevention Plan (ESP 113.1) requirements and utilization of CFR crews are means to develop effective mitigations against at-risk work activities in the wildland to avoid hindering the ability of utility operations maintaining infrastructure and has no influence on the specific work methods on how utility operations perform the at-risk work activities.

To record each specific at-risk activity per crew, per day, would be an undue administrative burden, however it is understood that the necessity of the CFR

2023 Staffing Period	Contract Fire Resources (approx. avg)
June 5 - November 10	15

Utility Benchmarking:

PG&E's Dedicated Fire Watch crews and ignition-monitoring personnel required under their Wildfire Mitigation Matrix are staffed by PG&E employees with comparable qualifications to SDG&E's CFRs.

Pictures:

N/A

Workpaper	Emergency Preparedness
Category	Emergency Preparedness Plan
WMP Tracking ID	WMP.1008

Description	**Emergency Preparedness Plan**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor	4	36	7	0	0
Capital Expenditures Non-Labor	59	148	12	26	7
Capital Expenditures Direct Costs Subtotal	**64**	**183**	**19**	**26**	**7**
Capital Expenditures Indirect Costs	8	59	35	27	25
Capital Total	**72**	**243**	**54**	**53**	**32**
O&M Labor	2,727	4,583	3,385	2,548	3,785
O&M Non-Labor	1,945	7,636	9,534	9,846	16,048
O&M Direct Costs Subtotal	**4,672**	**12,219**	**12,919**	**12,393**	**19,834**
O&M Indirect Costs	1,374	2,214	2,047	2,189	1,537
O&M Total	**6,045**	**14,432**	**14,966**	**14,582**	**21,371**
Units					
Unit 1	The variety of work activities in this category makes it infeasible to identify a single unit of measurement.				
Unit 2					
FTE*	19.7	32.6	23.5	17.1	**24.5**
Imputed Authorized Direct Capital $					721
Imputed Authorized Direct O&M $					2,043

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Emergency Operations					
Capital	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
O&M	**4,672**	**12,219**	**12,919**	**12,393**	**19,834**
Labor	2,727	4,583	3,385	2,548	3,785
Non-Labor	1,945	7,636	9,534	9,846	16,048
Emergency Operations Total	**4,672**	**12,219**	**12,919**	**12,393**	**19,834**
Aerial Mesh Network Expansion					
Capital	**64**	**183**	**19**	**26**	**7**
Labor	4	36	7	0	0
Non-Labor	59	148	12	26	7
O&M	**-**	**-**	**-**	**-**	**-**
Labor	-	-	-	-	-
Non-Labor	-	-	-	-	-
Aerial Mesh Network Expansion Total	**64**	**183**	**19**	**26**	**7**
Total	**4,736**	**12,402**	**12,938**	**12,420**	**19,840**

Business Purpose:

The business purpose of the Emergency Preparedness Plan was to provide an enterprise-wide strategic framework that enables SDG&E personnel to prepare for, respond to, and recover from wildfire events and Public Safety Power Shutoff (PSPS) events in a manner that protects public and employee safety, safeguards critical infrastructure, maintains continuity of essential services, and fulfills applicable federal and state regulatory requirements. This category included O&M spend in activities to help develop readiness and effective response such as plan development, training, equipping responders with the necessary facilities and communication capabilities, response to wildfire events such as PSPS, and continuous improvement programs.

Project Justification:

CPUC General Order (GO) 166, as modified by Decisions D.98-07-097, D.00-05-022, D.12-01-032, and D.14-05-020, required electric utilities to prepare, maintain, and annually update an Emergency Response and Disaster Preparedness Plan. In addition, federal and state emergency management mandates required the use of standardized incident management system for emergency response activities; this effort formalized and applied consistently the use of an incident management system across SDG&E. To support preparedness and the ability to activate and implement emergency plans, activities such as employee training, coordination with public safety partners, emergency management exercises, maintenance of response equipment and facilities, and structured AAR processes were necessary components of SDG&E's emergency management program.

On October 26, 2023, the Emergency Operations Center (EOC) was activated due to extreme wildfire conditions, including periods of critical wildfire weather and winds that were forecast to meet or exceed alert thresholds in portions of SDG&E's service territory. The Fire Potential Index (FPI), in combination with the National Weather Service (NWS), Santa Ana Wildfire Threat Index (SAWTI), Red Flag Warnings (RFWs), and SDG&E's internal weather modeling, indicated conditions that could necessitate a PSPS event. These indicators triggered a review of additional operational factors, including base alert wind speeds at weather stations, field observations, ongoing and existing wildfires and ignitions, available suppression resources, and overall system performance. As a result, SDG&E initiated PSPS protocols, including infrastructure patrols and community and customer notifications, for an event that included approximately 1,109 customers within scope. Although conditions ultimately did not materialize to the extent necessary to require de-energization, the response activities conducted during this PSPS activation are appropriately included as part of SDG&E's emergency preparedness and wildfire mitigation efforts.

Project Scope:

The scope of this project included the development, maintenance, implementation, and continuous improvement of company response and preparedness plans, along with the associated emergency preparedness, response coordination, equipment, and evaluation activities necessary to support an emergency management framework. This work established a strategic level management and coordination framework for emergency management and was supported by operational and tactical level plans, procedures, and tools that enabled coordinated incident response across SDG&E.

This project leveraged existing organizational structures, roles, and operational resources and, as necessary during emergency activations, transitioned those resources into an incident management structure compliant with regulations and emergency management best practices. The scope encompassed activities conducted during steady state preparedness, pre incident monitoring, incident response coordination, and post incident evaluation, consistent with the CEADPP and related standards.

The project was enabled by centralized emergency management infrastructure, including the EOC, which supported situational awareness, coordination, training, and workforce readiness functions integral to effective response. The scope also included emergency management training and exercises to validate readiness, as well as communications equipment and related response infrastructure necessary to facilitate effective coordination during emergency responses. Response activities conducted within this scope include activation of emergency management protocols in support of a PSPS event in October 2023.

Cost Drivers:

For Emergency operations, a combination of full time staff and year round contract labor was necessary to support preparedness and planning activities, help regulatory compliance, and respond to evolving wildfire and weather conditions. Where appropriate, short term contracts were utilized to meet temporary or surge needs. For example, consultant contracts of limited duration were used to support PSPS exercises rather than adding permanent full time staff. The PSPS activation in October 2023 contributed to O&M expenditures, as personnel performed response activities such as system patrolling and customer notifications as part of wildfire mitigation and emergency response efforts.

Project Timing and Phases:

This category consists of daily preparedness and planning activities however significant milestones include:
PSPS Tabletop Exercise: April 11, 2023
PSPS Functional Exercise: May 1-2, 2023
Annual PSPS Responder Training: 6/5/2023, 6/7/2023, 6/8/2023, 6/15/2023
AB1650 Public Meetings: 3/8/2023, 3/15/2023, 3/22/2023
PSPS Activation: 10/26/2023

Approval Process/Procurement Process:

Contract services were obtained through a competitive, managed services procurement process in accordance with SDG&E procedures.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

Program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.4.3.1, 8.4.1.1, 8.4.1.2, and 8.4.3.4. This program does not have specified targets.

Risk Identification and Mitigation:

Public Safety and Life Safety Risk
Risk Identified: Inadequate preparedness, coordination, or response during wildfire, PSPS, or extreme weather events could have resulted in injury or loss of life, particularly for vulnerable populations, including Medical Baseline (MBL) and Access and Functional Needs (AFN) customers.

Mitigation Strategy Implemented: SDG&E mitigated this risk through continued implementation and annual updates of planning documents and alignment with incident management practices. EOC readiness, training, and exercise programs were expanded, and lessons learned from prior emergency events were integrated through structured AARs. Coordination with public safety partners and community organizations was enhanced to support preparedness, response, and recovery activities.

Operational and Reliability Risk
Risk Identified: Without sufficient preparedness and coordination, SDG&E faced increased risk of delayed restoration, inefficient resource deployment, and operational misalignment during major emergency events, particularly during PSPS and multi day wildfire incidents.

Mitigation Strategy Implemented: This risk was mitigated by strengthening coordination between Emergency Management, the EOC, and Department Operations Centers for Electric and Gas operations. Centralized situational awareness and operational coordination were maintained through the WCRC, which served as the primary hub for emergency coordination and decision making. Emergency preparedness efforts also supported aviation resources, suppression coordination, and field operations, while workforce readiness was enhanced through training and exercises.

Regulatory and Compliance Risk
Risk Identified: Failure to maintain a compliant and operational emergency preparedness framework during PSPS events could have resulted in violations of CPUC GO 166 and AB 1650.

Mitigation Strategy Implemented: SDG&E mitigated this risk through annual Company Emergency and Disaster Preparedness Plan updates in compliance with GO 166, documentation of training, exercises, mutual assistance, and coordination activities, and fulfillment of AB 1650 consultation and plan sharing requirements with local governments and public safety partners. Records supporting regulatory filings, audits, and oversight were maintained.

Consideration of Alternative Solutions:

SDG&E did not evaluate emergency preparedness as a discretionary initiative with multiple interchangeable solution options. Instead, the scope and nature of the work were driven by risk identification under the RAMP framework, findings from external and internal assessments, and corrective actions identified through EOC activations, table-top and functional exercises, and AAR's. These inputs identified specific deficiencies and capability gaps that required targeted enhancement of Emergency Management oversight, planning, training, and coordination. As a result, SDG&E's focus was on implementing required corrective actions and risk mitigations.

Coordination with Similar Programs

Coordination with Emergency Management Programs

Coordination occurred with SDG&E's Emergency Management programs and planning activities, including the response planning, emergency operations procedures, training and exercises, and EOC activations. The primary EOC, consolidated emergency response functions. This coordination supported enterprise wide preparedness, response, and recovery activities across hazard types, including PSPS, wildfire, and severe weather events.
Emergency preparedness plans, exercises, and training programs continued to be developed and executed under established EM frameworks; however, the EOC would provide a centralized physical environment to support these activities, improving coordination, situational awareness, and operational effectiveness without creating redundant programs or planning structures.

Coordination with Wildfire Mitigation and Fire Science Programs

Coordination occurred with Wildfire Mitigation and Fire Science Climate Adaptation programs by supporting collaboration and information sharing with teams responsible for program development, analysis, and implementation of wildfire mitigation or fire science activities. This coordination helped guide that wildfire science, mitigation planning, and emergency response activities to be aligned and mutually reinforcing.

Coordination with Community Preparedness and Public Engagement Programs

Coordination occurred with existing community preparedness, education, and outreach programs by serving as a centralized public facing venue for engagement and education. The EOC would support wildfire safety education, emergency preparedness awareness, and collaboration with community based organizations, Tribal partners, and external stakeholders. These activities complemented, rather than duplicated, field based outreach efforts such as Community Resource Centers (CRCs) and wildfire safety events by providing a permanent location for education and collaboration outside of emergency activations.

Stakeholder Impact and Engagement:

SDG&E's Emergency Management programs affected a broad range of external stakeholders, including customers, community members, local governments, emergency responders, Tribal governments, and regulatory agencies. These stakeholders were impacted primarily during emergency and disaster events, such as PSPS, wildfires, and severe weather events, when coordinated response, communication, and recovery activities were required.
Emergency Management programs engaged external stakeholders through established planning, communication, and coordination mechanisms. These efforts included advance preparedness planning, coordination with local and regional emergency response agencies, execution of emergency training and exercises, and direct communication with customers and communities before, during, and after emergency events. During active incidents, Emergency Management programs supported timely dissemination of situational updates and safety information to affected stakeholders and coordinated response activities with governmental and emergency partners to support public safety and continuity of essential services.
Stakeholder engagement activities were designed to align with enterprise emergency preparedness frameworks and regulatory requirements. These programs did not create new outreach structures; instead, they relied on established emergency communication channels, mutual assistance coordination, and interagency collaboration to help provide efficient engagement while avoiding duplication of efforts.

Metrics:

See table below.

Year	Metric	Value
2023	Company Emergency And Disaster Preparedness Plan maintained and implemented in compliance with CPUC GO 166, Incident Command System, National Incident Management System, and State Emergency Management System and validated through exercises	Achieved
2023	Emergency training and exercises conducted including PSPS scenarios	Achieved
2023	EOC and Department Operations Centers activated for exercises and events	Achieved
2023	After Action Reviews completed and corrective actions incorporated into plans, procedures, or training	Achieved
2023	Pre event coordination and ongoing engagement with public safety partners	Achieved
2023	Participation in Joint IOU Working Groups	Achieved
2023	AB 1650 emergency preparedness consultation and plan sharing requirements	Achieved

Program	Outcome
Company Emergency and Disaster Preparedness Plan (CEADPP)	Maintained a consistent, all hazards emergency management framework applied enterprise wide
Emergency Operations and Coordination (EOC/DOCs)	Demonstrated operational readiness through activations, exercises, and coordinated response support. Supported situational awareness, coordination, training, and cross functional integration
Training, Exercises, and Responder Workforce Readiness	Validated roles, coordination, and ICS/NIMS application; identified and addressed improvement areas
After Action Review (AAR) Program	Enabled continuous improvement through structured lessons learned and corrective actions
Joint IOU Working Group Collaboration	Improved consistency in PSPS notifications, metrics, and public safety partner coordination
Public Safety Partner Engagement (including AB 1650)	Fulfilled consultation, coordination, and information sharing requirements
Regulatory Compliance	Maintained audit ready documentation and demonstrated emergency preparedness capability

Utility Benchmarking:

In 2023, SDG&E's emergency preparedness activities were informed by benchmarking against peer electric and gas utilities, external emergency management standards, and regulatory expectations. Benchmarking focused on operational coordination, PSPS execution, emergency communications, training and exercises, and plan management. These efforts helped the alignment with industry best practices and lessons learned from major emergency events in California and other high risk jurisdictions.

SDG&E participated in Joint IOU Working Groups, which facilitated comparison of customer notification practices, outreach to AFN populations, coordination with public safety partners and local governments, and alignment on PSPS metrics and post event reporting. Lessons from these forums informed updates to PSPS procedures and broader all hazards emergency management plans.

Additional benchmarking through statewide and national utility forums emphasized centralized emergency management oversight, consistent use of Incident Command System and National Incident Management System, recurring exercises, and structured AAR's. External assessments, including the Emergency Management Accreditation Program Preliminary Assessment and CPUC GO 166 annual reporting, further informed improvements to plan maintenance, documentation, training, and operational readiness.

Pictures:

N/A

Workpaper	Community Outreach and Engagement
Category	Community Engagement
WMP Tracking ID	WMP.1337

Description	**Community Engagement**				
($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Capital Expenditures Labor		-			
Capital Expenditures Non-Labor					
Capital Expenditures Direct Costs Subtotal	-	-	-	-	-
Capital Expenditures Indirect Costs					
Capital Total	-	-	-	-	-
O&M Labor	12	163	146	83	66
O&M Non-Labor	52	371	471	317	383
O&M Direct Costs Subtotal	**64**	**534**	**617**	**400**	**448**
O&M Indirect Costs	10	123	103	71	25
O&M Total	**74**	**657**	**720**	**472**	**473**
Units					
Wildfire Fairs	3	3	5	4	5
FTE*	0.1	1.9	1.7	1.0	0.7
Imputed Authorized Direct Capital $					-
Imputed Authorized Direct O&M $					-

*Based on average cost per hour/available annual work hours.

Direct Cost Breakdown by Cost Category:

($ in thousands)	**Prior Years Spend**				**Track 3**
	2019	**2020**	**2021**	**2022**	**2023**
Community Outreach & Public Awareness					
Capital	-	-	-	-	-
Labor					
Non-Labor					
O&M	**64**	**534**	**617**	**400**	**448**
Labor	12	163	146	83	66
Non-Labor	52	371	471	317	383
Community Outreach & Public Awareness Total	**64**	**534**	**617**	**400**	**448**

Business Purpose:

Enhance public safety and community resilience through community outreach by increasing understanding of wildfire risk, improving customer preparedness during de-energizations for Public Safety Power Shutoff, strengthening partnerships with local governments, emergency responders, Tribes, and community-based organizations.

Project Justification:

Through community outreach, the program delivered targeted education, improved customer readiness, and reduced safety risks during wildfire and PSPS de-energizations, directly benefiting the communities SDG&E serves. In 2019, SDG&E began hosting Wildfire Safety Fairs in response to increasing wildfire risk in the region and direct feedback from the community. SDG&E recognizes that community preparedness is a critical layer of wildfire mitigation, alongside infrastructure hardening and vegetation management. The fairs provided clear, actionable safety information and provided customers with direct access to SDG&E expertise, hands-on safety demonstrations, engagement with local emergency and community safety partners, family engagement, and incentives including food, resiliency giveaways, and emergency preparedness offerings. By strengthening partnerships with local governments, emergency responders, Tribes, and community-based organizations improves coordination, SDG&E assisted vulnerable populations to be reached and enhanced the effectiveness of regional emergency response efforts. These activities fulfilled requirements outlined in the Wildfire Mitigation plan, under Public Utilities Code §8386, which mandates community outreach and education as part of wildfire mitigation planning, as well as R.21-10-001 and R.18-12-005, which require SDG&E to coordinate with local governments and community stakeholders to provide robust communication and conduct accessible, multilingual, engaging, equitable community outreach.

Project Scope:

The project scope was for 5 Wildfire Safety Fairs and included:
1) Planning & Program Management
2) Financial Management
3) Community & Partner Coordination
4) Venue & Infrastructure Management
5) Logistics & Operations
6) Customer Education & Engagement
7) Multilingual & Accessible Communications
8) Preparedness & Promotional Materials
9) Reporting & Regulatory Compliance

Cost Drivers:

The 2020 - 2022 the Wildfire Safety Fairs was a drive-through format due to COVID-19 regulations. This adjustment limited in-person interaction and hands on demonstrations, resulting in a streamlined, contact-minimized event focused on safety and compliance with public health guidelines. In 2023 SDG&E returned to a traditional in-person format, restoring the full engagement and collaboration with fire departments, emergency responders, and community-based organizations that are essential for effective community wildfire preparedness.

1) Labor Logistics--Transportation, Delivery and Storage of resiliency giveaway items for Wildfire Safety Fairs
2) Promotional & Resiliency Giveaways
3) Marketing & Collateral Costs
4) Customer Resiliency Survey
5) Food & Refreshments
6) Venue Rental Fees
7) Vendor Fees
8) Recycling and waste management (during and after event)
9) Access and Functional Needs portable restrooms and sink
10) Audio Visual Equipment Rental Fees (generators, electrical outlets, and extension cords)
11) Travel & Mileage (delivery and storage)

Project Timing and Phases:

Phase I (November (2022) - February (2023)): Program Strategy - Set objectives, budget, draft calendar
Milestones: schedule drafted, budgets approved

Phase II (December - March): Site Selection, Community Partner Alignment, and Permitting
Milestones: Venues on hold, deposit paid, permit acquired

Phase III (February - March): Vendor Readiness - Finalize vendor participation
Milestones: Vendor roster finalized, estimates provided, vendor logistics sent

Phase IV (March - April): Marketing & Community Outreach - Drive attendance, especially in priority communities
Milestones: Outreach launched, reminder cadence set

Phase V (April-May): Operational Readiness - Finalize site, staffing, and safety plans
Milestones: site walk through, site map and logistics sent , staffing completed, safety plan finalized, equipment delivered, setup complete

Phase VI (May - September): Event Execution - Deliver a safe, accessible, high-value community experience
Milestones: Event completed, attendance estimates

Phase VII (May - September): Event Breakdown - Attendance verification, loading trucks and delivering items to off-site storage, return of SD Party Rental items.
Milestones: Close out of event, transportation of inventory of emergency giveaway items, storage for next WSF event

Phase VIII (September (2023) - January (2024)): Plan for next year, Analyze Wildfire Safety Fair attendance metrics from customer surveys, assess lessons learned from customer feedback for each event, compile 2024 opportunities, and propose 2024 Wildfire Safety Fair target/proposed WMP budget.

Approval Process/Procurement Process:

This program was approved in accordance with SDG&E's Approval and Commitment Policy.

Approved 2023 WMP Annual Targets (units and spending explanation, as needed):

The program was included in SDG&E's 2023-2025 Wildfire Mitigation Plan within section 8.5.3.5, 8.5.4 and 8.5.4. This program does not have specified targets.

Risk Identification and Mitigation:

Customers and the general public may not have knowledge of wildfire safety, resiliency, and emergency preparedness. In addition, they do not have a way to access information before an emergency, wildfire, or PSPS event occurs. Without this information, customers cannot take the necessary steps to prepare for and navigate the inherent difficulties these events may bring and identify actions they can perform to avoid a wildfire occurring in their community. These fairs provided information and education needed to address these risks.

Consideration of Alternative Solutions:

1. Do Nothing - This does not meet the outreach and engagement compliance requirements outlined above.
2. Virtual Webinars - Virtual webinars are not enough, overall lower engagement levels and alternative will limit the ability to reach the diverse audience who benefit from in-person, hands-on wildfire safety outreach.
3. Direct Mail / Digital Outreach - Alone, are not sufficient, they lack the personal interaction, trust-building, and also limit the ability to confirm materials were reviewed and reach to the diverse audiences we serve. Not everyone prefers digital platforms.
4. Open House Presentations / Mini-Wildfire Safety Fairs / Fire Safe Council Meetings - Complementary efforts, alone these do not include the various SDG&E subject matter experts like at the large scale Wildfire Safety Fairs and attendance/audience is limited.
5. Rely on local governments, Tribes, Community-Based Organizations, and fire agencies to deliver education - Critical collaborators, however, alone, the outreach efforts and timelines may vary by jurisdiction and resources, they may not have the bandwidth to deliver the consistent, utility-led outreach education and engagement that SDG&E provides.

While there are several alternative solutions with some having lower costs, SDG&E received direct feedback from customers that the in-person wildfire safety fairs remain the most effective way to engage and educate communities directly impacted by PSPS events. Wildfire Safety Fairs are done in addition to digital and direct mail outreach tactics. It takes customers multiple touchpoints before content resonates and action is taken. A comprehensive outreach and education strategy provides effectiveness, meets customers where they are, tailoring our approach to the diverse preferences, needs, and communication styles of the communities we serve. By collaborating with local fire departments, emergency responders, and community-based organizations, SDG&E builds trust, develops consistent messaging, brings together hands-on demonstrations, face-to-face engagement, and expert guidance to reduce wildfire risk by customers and increase community resiliency.

Coordination with Similar Programs

The design, approval, and delivery process in collaboration with SDG&E Marketing and Communications department for the delivery of digital and physical collateral for various SDG&E departments (such as Vegetation Management and Customer Programs) wildfire resiliency programs such as the Standby Power Programs, Land Services, Fixed Backup Power Program, Generator Grant Program, and Generator Assistance Program. This coordination removed duplicate requests and provided alignment with messaging to the community.

SDG&E coordinated wildfire safety outreach with local governments, fire agencies, emergency responders, tribal governments, and community-based organizations through sharing event planning details, content alignment allowing for efforts being complementary rather than duplicative. SDG&E leveraged partner-led channels for promotion and co-delivery where appropriate. To extend equitable access and further minimize redundancy, SDG&E conducted mini-Wildfire Safety Fairs in smaller, high-risk or hard-to-reach communities for customers unable to attend large-scale fairs, expanding reach without replicating full-size event costs, and guiding consistent wildfire and PSPS preparedness across the service territory.

Stakeholder Impact and Engagement:

Wildfire Safety Fairs bring together internal teams, customers, local governments, emergency responders, and community-based organizations in a coordinated, in-person setting that strengthens relationships and improves overall community preparedness. External stakeholders benefit from consistent messaging, shared resources, and opportunities to educate the public alongside SDG&E, while customers, especially those in high fire-risk or are most vulnerable, receive hands-on guidance, demonstrations, and preparedness tools and resources that digital or mail channels alone cannot provide. Engagement and communication efforts use a multi-touchpoint approach that combines in-person interaction with digital outreach, direct mail, multilingual materials, and trusted messenger networks, provided clear, accessible, and actionable wildfire and PSPS information is delivered across the diverse communities SDG&E serves.

Metrics:

Customer Reach - over ~3,400 attendees in 5 different locations (Mountain Empire, Ramona, Alpine, Julian and Valley Center)
Average cost per attendee = ~$132
Overall Satisfaction Rating & Experience - 2022 ~96% Very Satisfied Rating (Qualtrics Survey)
Community Partnerships & Collaborations - 25-46 booths per WSF (25-46 vendors/SDG&E representation)
Regulatory Compliance - completed all Access and Functional Needs, PSPS post and pre-season reports on time

The Community and Outreach Program successfully met its key metrics by successfully executing five Wildfire Safety Fairs and reaching a wide range of customers, including those with Access and Functional Needs, Environmental and Social Justice communities, Disadvantaged Communities, Hard-to-Reach populations, and Tribal communities, delivering clear and useful emergency preparedness information, and earning strong satisfaction ratings from attendees. Collaboration with local governments, emergency responders, and community-based organizations strengthened event delivery and expanded the reach of safety messaging. In addition, outreach activities were conducted in alignment with regulatory requirements, providing accessible, equitable, and compliant wildfire and PSPS education across the diverse communities SDG&E serves.

Utility Benchmarking:

N/A

Pictures:

YouTube Link: https://youtu.be/vCUxGpwaSBw