State of California – A Natural Resources Agency
Gavin Newsom, Governor

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Caroline Thomas Jacobs, Director

To: Stakeholders for San Diego Gas & Electric Company's 2023-2025 Wildfire Mitigation Plan

August 30, 2023

Enclosed is the Draft Decision of the Office of Energy Infrastructure Safety (Energy Safety) presenting its evaluation of San Diego Gas & Electric Company's 2023-2025 Wildfire Mitigation Plan.

This Draft Decision is published for public review and comment. Opening comments must be submitted no later than September 19, 2023. Reply comments must be submitted no later than September 29, 2023.[1]

Comments must be submitted to Energy Safety's e-filing system in the 2023-2025 Wildfire Mitigation Plans docket (2023-2025-WMPs).[2]

Sincerely,

Shannon O'Rourke
Deputy Director | Electrical Infrastructure Directorate
Office of Energy Infrastructure Safety

[1] Dates falling on a Saturday or holiday as defined in Government Code Section 6700 have been adjusted to the next business day in accordance with Government Code Section 6707.
[2] Submit comments via the 2023-2025-WMPs docket on Energy Safety's e-filing system (https://efiling.energysafety.ca.gov/EFiling/DocketInformation.aspx?docketnumber=2023-2025-WMPs, accessed August 18, 2023).

OFFICE OF ENERGY INFRASTRUCTURE SAFETY

DRAFT DECISION ON 2023-2025 WILDFIRE MITIGATION PLAN

SAN DIEGO GAS & ELECTRIC COMPANY

August 2023

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1. Executive Summary

The Office of Energy Infrastructure Safety (Energy Safety) works to ensure electrical corporations take effective actions to reduce utility-related wildfire risk. Pursuant to Public Utilities Code section 8386.3(a), this Decision serves as Energy Safety's assessment and approval of San Diego Gas & Electric Company's (SDG&E's) 2023-2025 Wildfire Mitigation Plan, submitted on March 27, 2023. Energy Safety's Decision incorporates comments from the public and other stakeholders.

SDG&E has a relatively strong Wildfire Mitigation Plan compared to the plans of the other large electrical corporations. SDG&E knows its wildfire risk and is focused on the highest risk circuits on its system. In particular, it is relatively strong in its vegetation management, situational awareness, emergency preparedness, and community outreach and engagement. Regarding vegetation management, SDG&E has the lowest number of vegetation-caused ignitions and outages per 10,000 overhead circuit miles among the large electrical corporations (Figure 8.2-3). Regarding situational awareness, SDG&E has a relatively dense weather station network, with all of the stations able to station report wind speed, wind gust, wind direction, temperature, and humidity every 10 minutes and most of the stations able to report these indicators every 30 seconds if needed. SDG&E is able to use past data to train its artificial intelligence forecasting system, which is now integrated into most of its stations. Regarding emergency preparedness, SDG&E is working toward accreditation through the Emergency Management Accreditation Program. Regarding community outreach and engagement, SDG&E is developing a Wildfire and Climate Resiliency Center where it will conduct staff and partner training and outreach activities. Additionally, SDG&E has created a role in its Emergency Operations Center dedicated to liaising with its customers with access and functional needs.

Despite its strengths, there are some areas of SDG&E's WMP that can be further developed and improved. SDG&E currently uses a planning tool that compares two wildfire mitigation initiatives—undergrounding and covered conductor. Energy Safety expects SDG&E to compare those two alternatives in combination with interim measures that take less time and are less resource-intensive, such as early fault detection. Additionally, SDG&E, along with the other large electrical corporations, is not sufficiently addressing the known failures of covered conductor in its maintenance and inspections procedures.

2. Introduction and Background

San Diego Gas & Electric Company (SDG&E) submitted its 2023-2025 Wildfire Mitigation Plan (Base WMP or WMP) covering a three-year term from 2023 through the end of 2025 (the current WMP cycle) on March 27, 2023, in response to the reporting requirements set forth in Energy Safety's 2023-2025 WMP Technical Guidelines (Technical Guidelines)[1] and the processes set forth in Energy Safety's WMP Process and Evaluation Guidelines (Process Guidelines).[2]

Pursuant to Public Utilities Code section 8386.3(a), this Decision is Energy Safety's assessment of SDG&E's 2023-2025 WMP.

Energy Safety approves SDG&E's 2023-2025 WMP. In 2024, SDG&E must submit a 2025 Update consistent with the 2025 WMP Guidelines. Energy Safety will approve or deny SDG&E's 2025 Update to its Base Plan.

2.1 Consultation with California Department of Forestry and Fire Protection

The Office of the State Fire Marshal is part of the California Department of Forestry and Fire Protection (CAL FIRE). Public Utilities Code section 8386.3(a) requires Energy Safety to consult with the Office of the State Fire Marshal in reviewing electrical corporations'[3] WMPs and WMP Updates. The Office of the State Fire Marshal provided meaningful consultation and input on the evaluation, but this Decision is solely an action of Energy Safety and not the Office of the State Fire Marshal or CAL FIRE.

2.2 Stakeholder Comments

Energy Safety invited stakeholders, including members of the public, to provide comments on the utilities' 2023-2025 WMPs. Opening comments on SDG&E's Base WMP were due on May 26, 2023, and reply comments were due on June 5, 2023. See Appendix D for a list of stakeholders that submitted comments, including comments that Energy Safety concurred with and incorporated into its evaluation.

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[1] Energy Safety's 2023-2025 Wildfire Mitigation Plan Technical Guidelines (Dec. 2022) (hereafter Technical Guidelines) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[2] Energy Safety's 2023-2025 Wildfire Mitigation Plan Process and Evaluation Guidelines (Dec. 2022) (hereafter Process Guidelines) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53287&shareable=true, accessed May 5, 2023).

[3] In this document, "utility" should be understood to mean "electrical corporation."

3. Energy Safety's 2023 Evaluation Process

Energy Safety issued the following guidelines for electrical corporations' 2023-2025 WMPs:

- **2023-2025 WMP Technical Guidelines**, which sets forth substantive and procedural requirements for electrical corporations to prepare and submit their WMPs.[4]
- **ITO Supplement to 2023-2025 WMP Technical Guidelines**, which establishes the modified reporting requirements for independent transmission operators (ITOs).[5]
- **2023-2025 WMP Process and Evaluation Guidelines**, which outlines the process for Energy Safety's evaluation of WMPs, details the public participation process, and establishes submission requirements for the electrical corporations.[6]
- **2023-2025 Maturity Model and Survey**, which provides a quantitative method for assessing electrical corporation wildfire risk mitigation capabilities and examining how electrical corporations propose to continuously improve in key areas of their WMPs.[7, 8]

The WMP evaluation process includes some or all the following steps for each utility, which are described in more detail in the remainder of this section:

- Completeness check of the utilities' WMP pre-submissions

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[4] Technical Guidelines (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[5] Energy Safety's Independent Transmission Operator Supplement to the 2023-2025 Wildfire Mitigation Plan Technical Guidelines (Dec. 2022) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53290&shareable=true, accessed May 5, 2023).

[6] Process Guidelines (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53287&shareable=true, accessed May 5, 2023).

[7] Second Revised Final Maturity Model and Maturity Survey Letter (Feb. 2023) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53393&shareable=true, accessed May 5, 2023);

2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (Second Revised Final, Feb. 2023) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53394&shareable=true, accessed May 5, 2023);

2023 Electrical Corporation Wildfire Mitigation Maturity Survey (Second Revised Final, Feb. 2023) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53395&shareable=true, accessed May 5, 2023). This is the version that electrical corporations saw when filling out the survey.

[8] 2023 Electrical Corporation Wildfire Mitigation Maturity Survey Revised Final, April 2023) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53708&shareable=true, accessed May 5, 2023). This is the version used by Energy Safety when scoring the survey.

- Energy Safety's evaluation of utilities' WMPs, including consideration of Maturity Survey results, areas where the utility has progressed, and areas where the utility must improve
- Issuance of a Revision Notice if Energy Safety identifies critical issues associated with a utility's WMP
- Publication of Energy Safety draft Decision
- Publication of Energy Safety's Decision approving or denying a utility's WMP
- Various forms of public participation throughout the process

3.1 WMP Completeness

The first step in Energy Safety's WMP evaluation is a completeness check.[9] SDG&E provided its WMP pre-submission to Energy Safety on February 13, 2023.

Energy Safety determined that SDG&E's WMP pre-submission did not satisfy the completeness check and notified SDG&E on March 6, 2023, of what information was required to make its WMP complete.

SDG&E submitted its revised Base WMP on March 27, 2023.

3.2 Maturity Model and Survey

Energy Safety used the 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model[10] (Maturity Model) and 2023 Electrical Corporation Wildfire Mitigation Maturity Survey[11] (Maturity Survey), which together provided a quantitative method to assess the maturity of each utility's wildfire risk mitigation program. The current version of the Maturity Model is an update to the original version that Energy Safety used to assess utility maturity during the first WMP cycle (2020-2022).

The Maturity Model consists of 37 individual capabilities describing the ability of electrical corporations to mitigate wildfire risk and Public Safety Power Shutoff (PSPS) risk within their service territory. The 37 capabilities are aggregated into seven categories. Maturity levels range from 0 (below minimum requirements) to 4 (beyond best practice). For each utility, Energy Safety calculated maturity levels for each capability, each category, five cross-

[9] Process Guidelines, Section 4.1, pages 3-5 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53287&shareable=true, accessed May 5, 2023).

[10] 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (Second Revised Final, Feb. 2023) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53394&shareable=true, accessed May 5, 2023).

[11] 2023 Electrical Corporation Wildfire Mitigation Maturity Survey Revised Final, April 2023) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53708&shareable=true, accessed May 5, 2023). This is the version used by Energy Safety when scoring the survey.

category themes, and the overall WMP, based on the utility's answers to Maturity Survey questions and the scoring system described in the Maturity Model.

Energy Safety evaluated each utility's reported and projected wildfire mitigation maturity in the context of the utility's corresponding current and planned initiatives described in its WMP.

The results from the 2023 Maturity Survey establishes a baseline for maturity as well as the utility's anticipated progress over this three-year plan period.

Energy Safety assessed the results of each utility's Maturity Survey and discussed how the utility is progressing—or not—in maturity relative to each mitigation initiative. SDG&E's results specific to each initiative are discussed in Sections 6 through 9 of this Decision, and overall results for SDG&E can be found in Appendix F.

3.3 Areas for Continued Improvement

Energy Safety's evaluation of the 2023-2025 WMPs focused on each utility's strategies for reducing the risk of utility-related ignitions. Energy Safety assessed the electrical corporation's progress on areas for improvement resulting from 2022 WMP evaluations, evaluating the feasibility of its strategies, and measuring year-to-year trends. As a result of this evaluation, Energy Safety identified areas where the utility must continue to improve its wildfire mitigation capabilities in future plans.[12]

Areas for continued improvement relative to each mitigation initiative are discussed in Sections 6 through 9 of this Decision. Specific areas for continued improvement prescribed by Energy Safety in 2023, including specific required progress, are listed in Section 11.

3.4 Revision Notice

Public Utilities Code section 8386.3(a) states, "Before approval, [Energy Safety] may require modifications of the [WMP]." If Energy Safety requires modifications to a WMP, it does so by issuing a Revision Notice to a utility.[13]

Energy Safety did not issue SDG&E a Revision Notice for its 2023-2025 WMP.

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[12] Process Guidelines, Section 4.7 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53287&shareable=true, accessed May 5, 2023).

[13] Process Guidelines, Section 4.4, page 6 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53287&shareable=true, accessed May 5, 2023).

3.5 Decision

In its evaluation of an electrical corporation's 2023-2025 WMP, Energy Safety considers the areas where the electrical corporation must improve, as well as the progress it plans to achieve in its areas of strength. As a result of its evaluation, Energy Safety determines whether the 2023-2025 WMP is approved or denied.[14]

If the WMP is approved, Energy Safety finds the electrical corporation's WMP is sufficient and expects it to complete mitigation initiatives as described in its WMP. An approved WMP demonstrates adequate progress toward wildfire mitigation, while still showing areas where the electrical corporation must improve.

If the WMP is denied, Energy Safety finds the electrical corporation's WMP is not satisfactory or does not include sufficient detail within a section or sub-section of the WMP. There may still be areas of strength within a denied WMP, but the issues are critical enough to warrant denial.

Energy Safety recognizes that planning for wildfire risk is a maturing capability and expects that electrical corporations will continue to improve year over year. Therefore, Energy Safety's Decision includes areas for continued improvement, identifying areas where the utility must continue to mature in its capabilities.

Energy Safety also highlights in its Decision areas of strength where the electrical corporation plans noteworthy improvements to its wildfire mitigation programs, sets ambitious and feasible targets for its programs, and/or sets out to achieve more than what is required.

Pursuant to Public Utilities Code section 8386.3(a), this Decision is the totality of Energy Safety's review of SDG&E's 2023-2025 WMP. SDG&E's 2023-2025 WMP is approved.

3.6 Change Order Requests

For information regarding Energy Safety's change order process, refer to Section 12 of the Process Guidelines.

[14] Process Guidelines, Section 5.3, page 10 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53287&shareable=true, accessed May 5, 2023).

4. Introductory Sections of the WMP

In response to Sections 1 through 4 of the Technical Guidelines, SDG&E provided basic information regarding persons responsible for executing the plan and adherence to statutory requirements.[15]

SDG&E provided the required information for these sections:

- Section 1: Executive Summary (Summary of the 2020–2022 WMP Cycle, Summary of the 2023–2025 Base WMP)
- Section 2: Responsible Persons (titles and credentials for: executive-level owner with overall responsibility; program owners with responsibility for each of the main components of the plan; as applicable, general ownership for questions related to or activities described in the WMP)
- Section 3: Statutory Requirements Checklist
    - This section provides a checklist of the statutory requirements for a WMP as detailed in Public Utilities Code section 8386(c).[16] By completing the checklist, the electrical corporation affirms that its WMP addresses each requirement. SDG&E completed this checklist.
- Section 4: Overview of WMP (Primary Goal; WMP Objectives; Proposed Expenditures; Risk-Informed Framework)

4.1 SDG&E's Wildfire Mitigation Expenditures

Section 4.3 of the Technical Guidelines requires electrical corporations to summarize projected expenditures for the current WMP cycle, as well as planned and actual expenditures from the previous WMP cycle (i.e., 2020–2022).[17]

SDG&E provided all required information regarding expenditures. A summary of this information is presented below. Table 4.1-1 presents a comparison of territory-wide projected expenditures by wildfire mitigation initiative category across the three large

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[15] Technical Guidelines, Sections 1 through 4, pages 6-14 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[16] Public Utilities Code section 8386 (https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=8386.&lawCode=PUC, accessed May 9, 2023).

[17] Energy Safety's WMP evaluation and decision on a WMP is not an approval of, or agreement with, costs listed in the WMP.

investor-owned utilities (IOUs). Table 4.1-2 provides the same information but divided by planned expenditures within and outside the California Public Utilities Commission's (CPUC's) high fire threat district (HFTD). These tables present total projected expenditure for the current 2023-2025 WMP cycle.

Since all electrical corporations spend a considerably higher percentage of their wildfire mitigation expenditures within the grid design and vegetation management categories, Figures 4.1-1 and 4.1-2 provide a more detailed breakdown of how expenditures within these categories are divided across major activity types.

Table 4.1-1.Large IOU Territory-Wide Expenditures per Initiative Category[18]

Total Territory (Includes HFTD)

WMP Initiative Category	PG&E	%	SCE	%	SDG&E	%	Grand Total	%
Grid Design, Operations, and Maintenance	$13 B	72%	$5.8 B	71%	$1.8 B	80%	$20.6 B	72%
Vegetation Management and Inspection	$3.6 B	20%	$1.8 B	22%	$213.8 M	9%	$5.6 B	20%
Other	$712.4 M	4%	0	0%	$0.0 M	0%	$712.4 M	2%
Emergency Preparedness	$163.6 M	1%	$300.3 M	4%	$144.1 M	6%	$608.0 M	2%
PSPS	$300.0 M	2%	0	0%	0	0%	$300.0 M	1%
Situational Awareness and Forecasting	$114.3 M	1%	$101.8 M	1%	$18.1 M	1%	$234.2 M	1%
Community Outreach and Engagement	$160.8 M	1%	$50.4 M	1%	$22.2 M	1%	$233.3 M	1%
Environmental Compliance and Permitting	0	0%	$136.2 M	2%	$3.0 M	0%	$139.2 M	0%
Wildfire Mitigation Strategy Development	0	0%	$11.8 M	0%	$53.7 M	2%	$65.5 M	0%
Risk Methodology and Assessment	$33.2 M	0%	$137.3 K	0%	0	0%	$33.4 M	0%
Grand Total	$18 B	100%	$8.2 B	100%	$2.3 B	100%	$28.6 B	100%

Table 4.1-2. Large IOU Expenditures per Initiative Category, HFTD vs non-HFTD

HFTD vs. Non-HFTD Territory	PG&E			SCE			SDG&E		
WMP Initiative Category	HFTD	Non-HFTD	% Spend in HFTD	HFTD	Non-HFTD	% Spend in HFTD	HFTD	Non-HFTD	% Spend in HFTD
Grid Design, Operations, and Maintenance	$10 B	$3 B	77%	$3.8 B	$2 B	67%	$1.7 B	$66.4 M	96%
Vegetation Management and Inspection	$1.2 B	$2.4 B	34%	$1.3 B	$455.8 M	75%	$146.6 M	$67.2 M	69%
Other	$712.4 M	0	100%	0	0	0%	$0.0 M	0	0%
Emergency Preparedness	$163.6 M	0	100%	$300.3 M	0	100%	$144.1 M	0	100%
PSPS	$300.0 M	0	100%	0	0	0%	0	0	0%
Situational Awareness and Forecasting	$114.3 M	0	100%	$101.8 M	0	100%	$18.1 M	0	100%
Community Outreach and Engagement	$160.8 M	0	100%	$50.4 M	0	100%	$22.2 M	0	100%
Environmental Compliance and Permitting	0	0	0%	$136.2 M	0	100%	$3 M	0	100%
Wildfire Mitigation Strategy Development	0	0	0%	$11.8 M	0	100%	$53.7 M	0	100%
Risk Methodology and Assessment	$10.3 M	$22.9 M	31%	$137.3 K	0	100%	0	0	0%
Grand Total	**$13 B**	**$5.4 B**	**70%**	**$5.8 B**	**$2 B**	**71%**	**$2.1 B**	**$133.6 M**	**94%**

[18] The "Environmental Compliance and Permitting" initiative category above correlates to the "Overview of the Service Territory" initiative in WMPs.

Figure 4.1-1. SDG&E Grid Design, Operations, and Maintenance Projected Expenditures (HFTD)

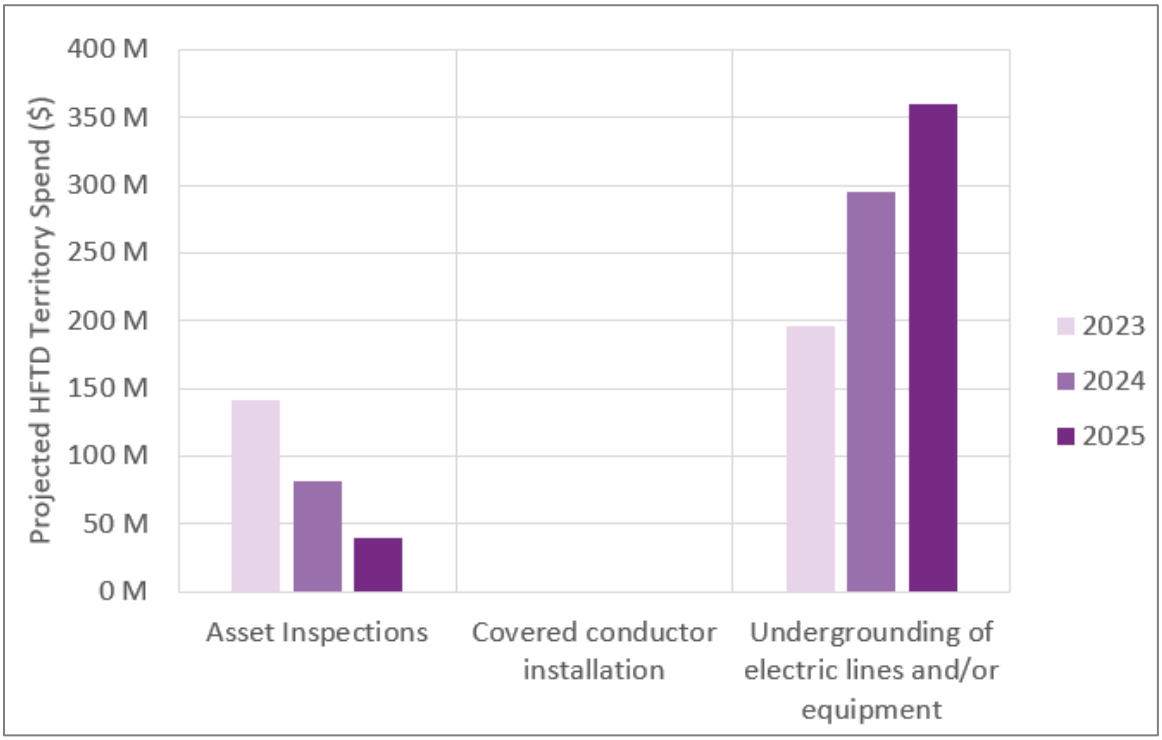
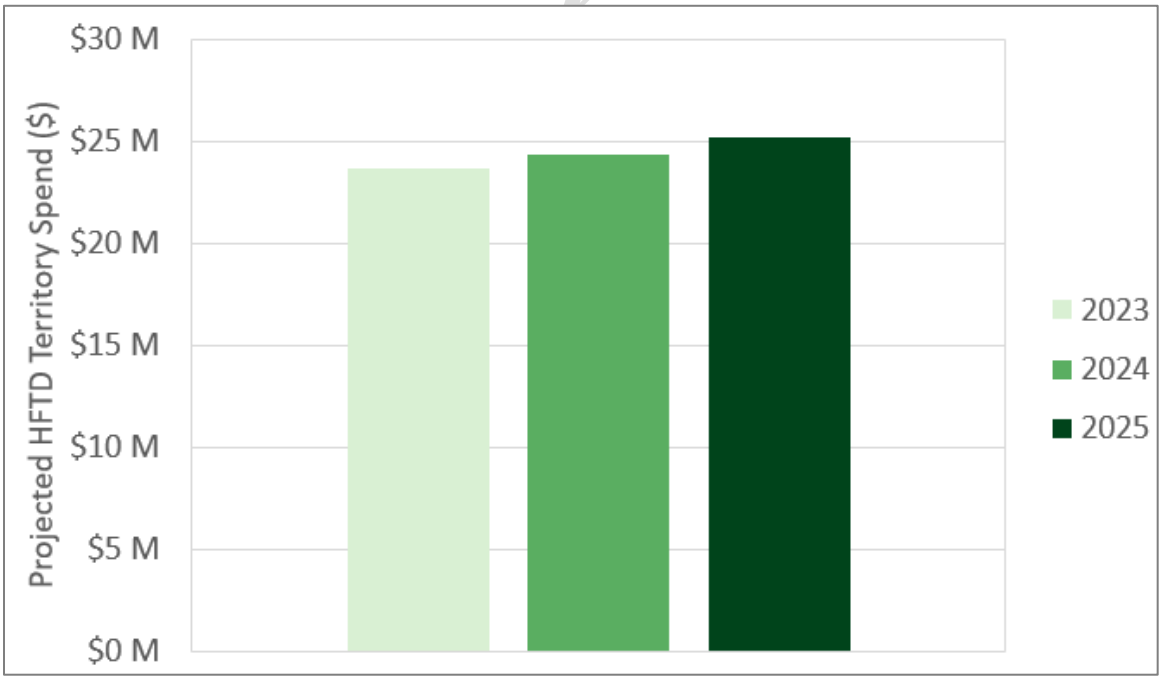


Figure 4.1-2. SDG&E Vegetation Management Projected Expenditures (HFTD)



5. Overview of the Service Territory

In response to Section 5 of the Technical Guidelines, SDG&E provided a high-level overview of its service territory that includes key characteristics of its electrical infrastructure, environmental settings, and community values at risk.[19]

Below are Energy Safety's summary and findings regarding SDG&E's reporting on its service territory.

5.1 Service Territory

Section 5.1 of the Technical Guidelines requires SDG&E to provide a high-level description of its service territory, including areas served, number of customers served, and geospatial maps.[20]

SDG&E reported that its service territory includes 4,096 square miles and serves roughly 1,503,100 customers. SDG&E also stated that 2,821 square miles of its territory are in the CPUC's HFTD Tier 2 and 3 lands, which is 69 percent of its territory. Compared to the peer utilities of Pacific Gas and Electric Company (PG&E) and Southern California Edison Company (SCE), SDG&E's service territory is the smallest in size, serves the least customers, and encompasses the smallest number of square miles of HFTD in its territory. Figures 5.1-1 and 5.1-2 below summarize the square miles served, customers served, and square miles of HFTD Tier 2 and 3 lands in SDG&E, PG&E, and SCE service territories.

[19] Technical Guidelines, Section 5, "Overview of the Service Territory," pages 15-29 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[20] Technical Guidelines, Section 5.4, "Service Territory," pages 15-16 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

Figure 5.1-1. Cross-Utility Square Miles Served

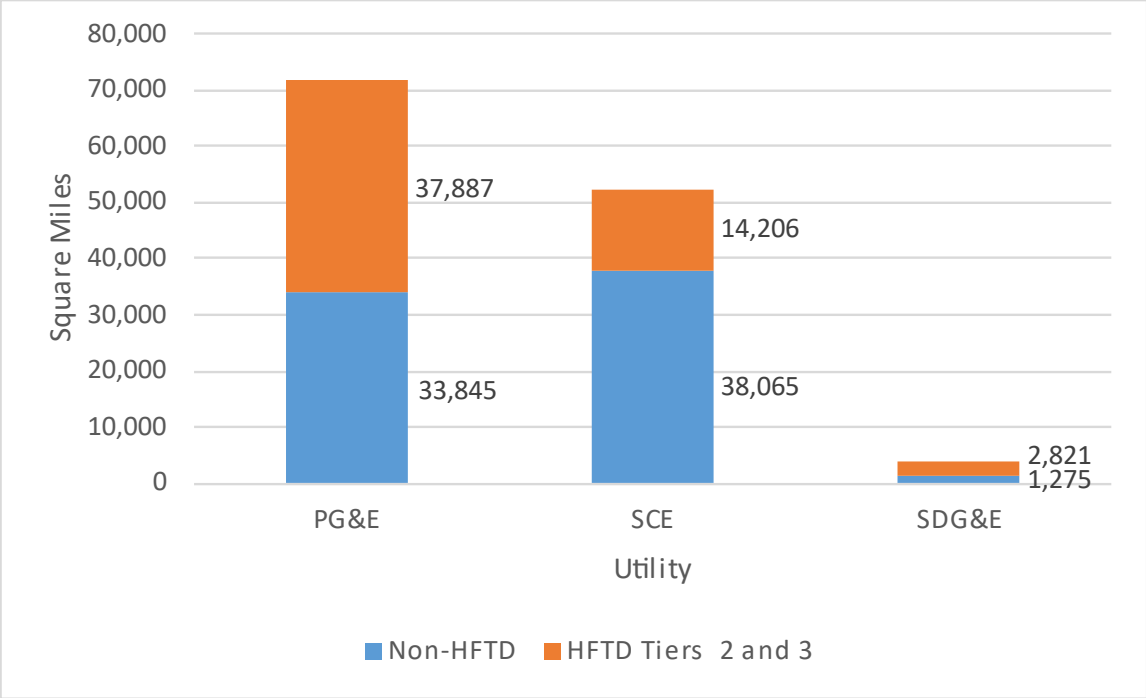
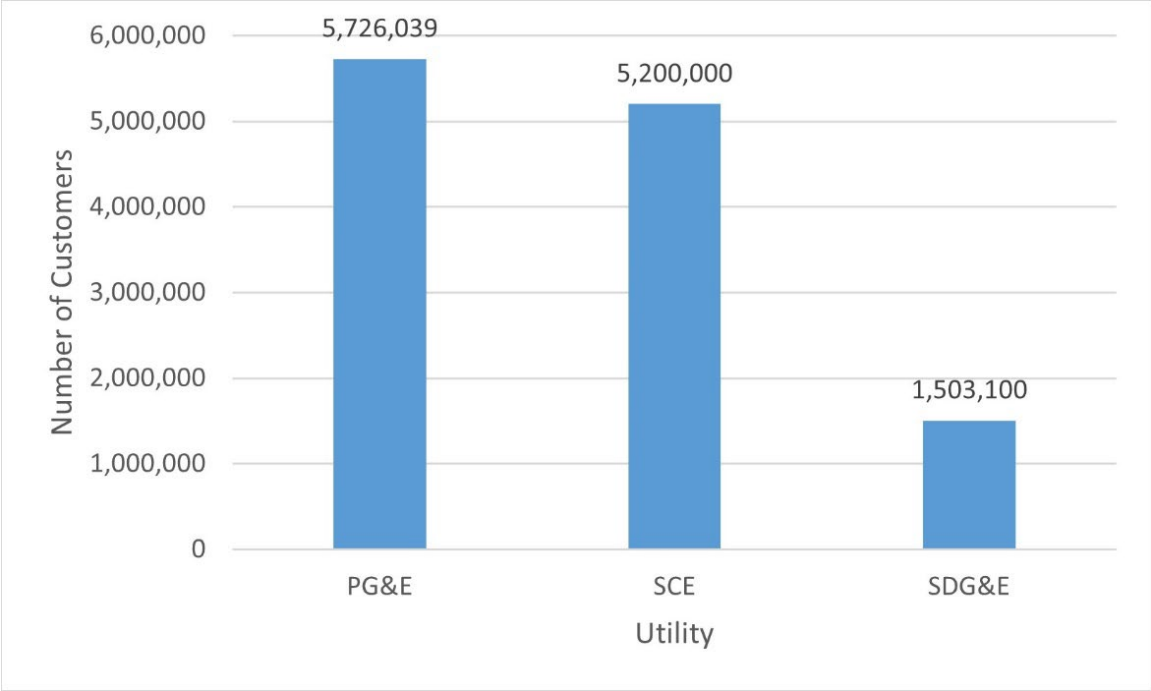


Figure 5.1-2. Cross-Utility Number of Customers Served

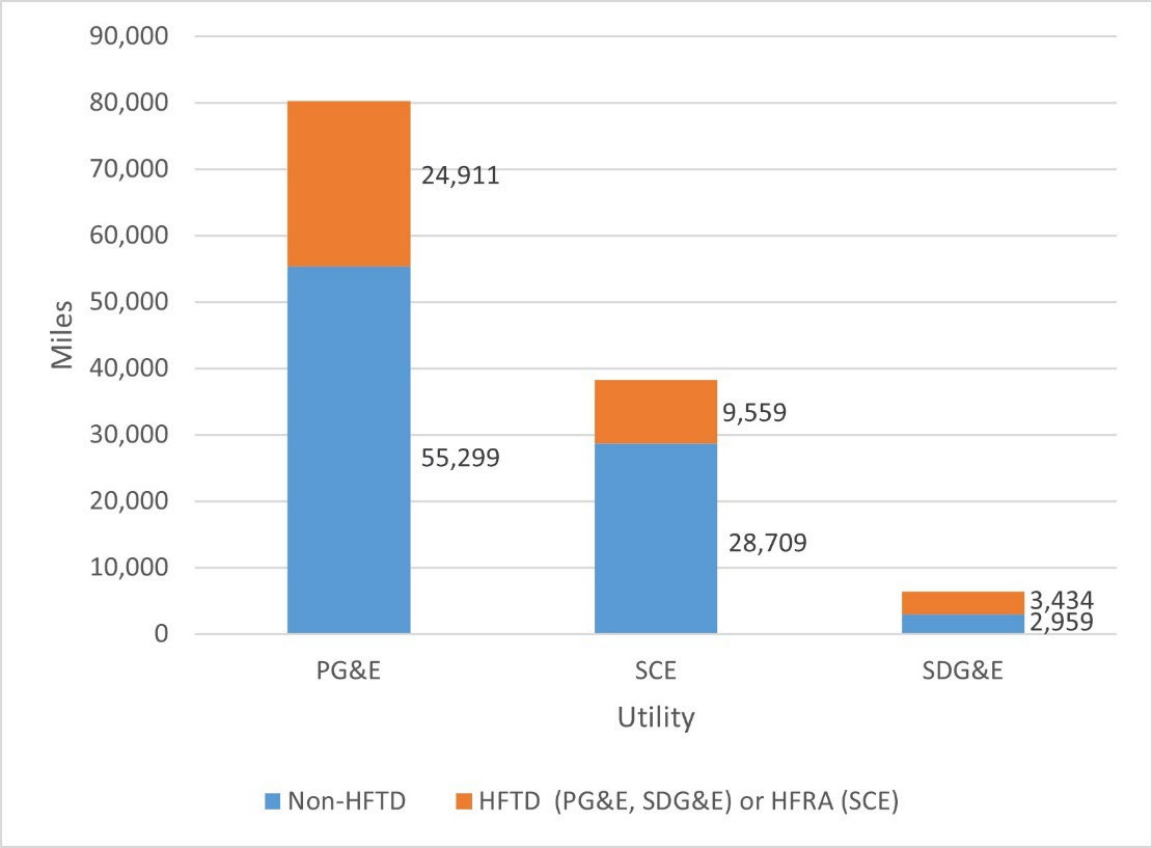


5.2 Electrical Infrastructure

Section 5.2 of the Technical Guidelines requires SDG&E to provide a high-level description of its infrastructure, including all power generation facilities, transmission and distribution lines and associated equipment, substations, and other major equipment.[21]

SDG&E provided a table showing the breakdown of conductor line miles of overhead and underground lines in and outside of its HFTD. Figures 5.2-1, 5.2-2, and 5.2-3 below summarize conductor line miles presented by SDG&E in comparison to its peer utilities.[22]

Figure 5.2-1. Cross-Utility Miles of Overhead Distribution Lines



[21] Technical Guidelines, Section 5.2, "Electrical Infrastructure," pages 16-17 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[22] In the legends of Figures 5.2-1 and 5.2-3 HFTD refers to the CPUC's high fire threat district and HFRA refers to SCE's High Fire Risk Area.

Figure 5.2-2. Cross-Utility Miles of Overhead Transmission Lines

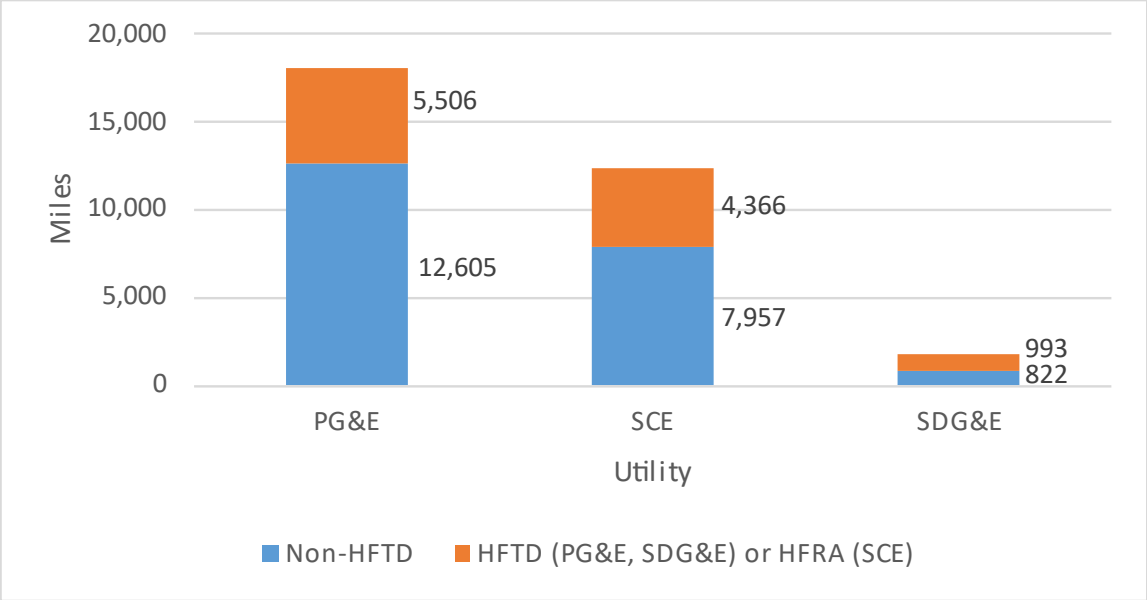
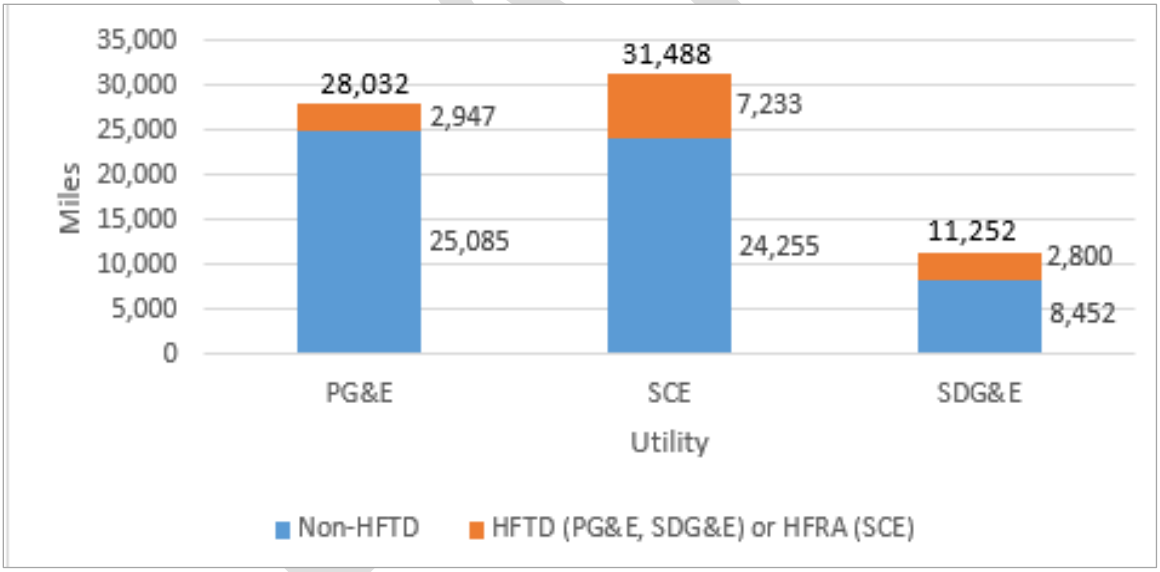


Figure 5.2-3. Cross-Utility Miles of Underground Distribution and Transmission Lines



5.3 Environmental Settings

Section 5.3 of the Technical Guidelines requires SDG&E to provide a high-level overview of the environmental settings within its service territory.[23]

5.3.1 Fire Ecology

Section 5.3.1 of the Technical Guidelines requires SDG&E to provide a brief narrative of the fire ecologies across its service territory, including how ecological features influence the propensity of the electrical corporation's service territory to experience wildfires. The Technical Guidelines also require tabulated statistics.[24]

SDG&E provided a narrative describing the vegetative coverage across its service territory. SDG&E additionally provided a table describing the existing vegetation types in SDG&E's service territory and/or pie chart showing a breakdown of the vegetation types in its service territory in percentages.

5.3.2 Catastrophic Wildfire History

Section 5.3.2 of the Technical Guidelines requires SDG&E to provide a brief narrative summarizing its wildfire history for the past 20 years as recorded by the electrical corporation, CAL FIRE, or another authoritative source.[25]

SDG&E reported zero catastrophic wildfires that were attributed to its facilities or equipment from 2015-2022.[26] Energy Safety defines catastrophic wildfires as those that resulted in at least one death, damaged over 500 structures, or burned over 5,000 acres. Figures 5.3-1, 5.3-2, and 5.3-3 below summarize the reported information on catastrophic wildfires for SDG&E, PG&E, and SCE.

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[23] Technical Guidelines, Section 5.3, "Environmental Settings," pages 17-26 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[24] Technical Guidelines, Section 5.3.1, "Fire Ecology," pages 17-18 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[25] Technical Guidelines, Section 5.3.2, "Catastrophic Wildfire History," pages 18-20 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[26] The reporting period for catastrophic wildfires represented here begins in 2015 because data limitations experienced by utilities. Also, although no data on wildfires associated with SDG&E appear in the charts in this section, SDG&E had two catastrophic wildfires between 2002 and 2022, both in 2007. These fires collectively burned 207,462 acres, caused 2 fatalities, and damaged or destroyed 1,984 structures.

Figure 5.3-1. Cross-Utility Number of Catastrophic Wildfires (2015-2022)

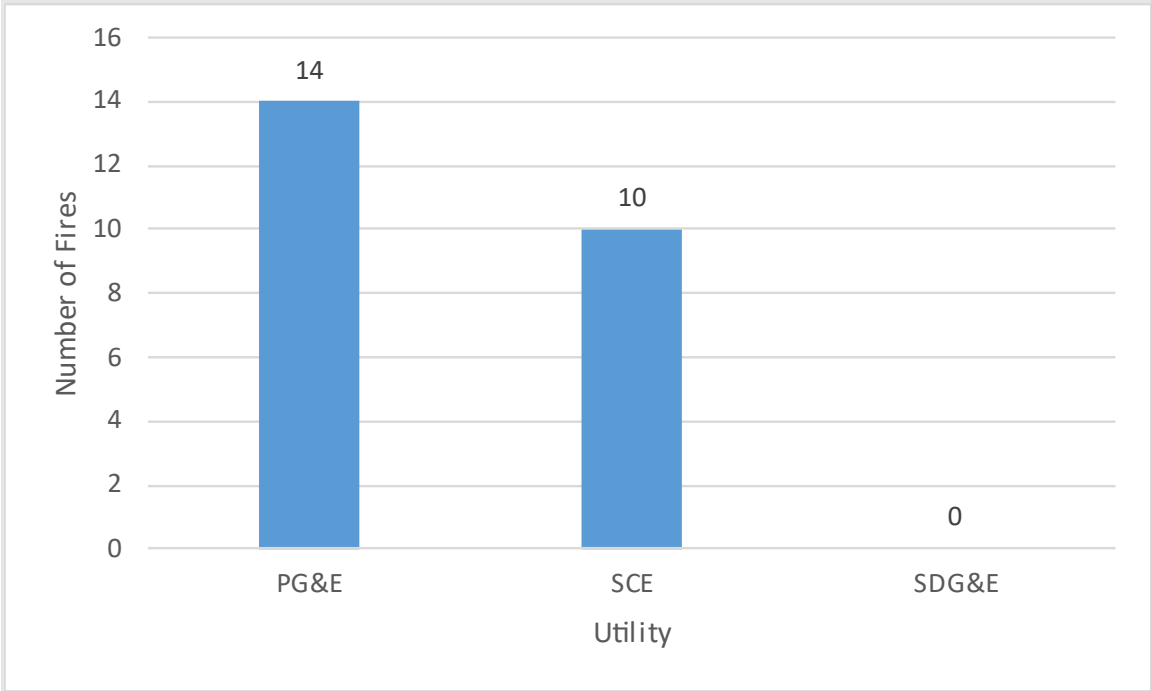


Figure 5.3-2. Cross-Utility Acres Burned by Catastrophic Wildfires (2015-2022)

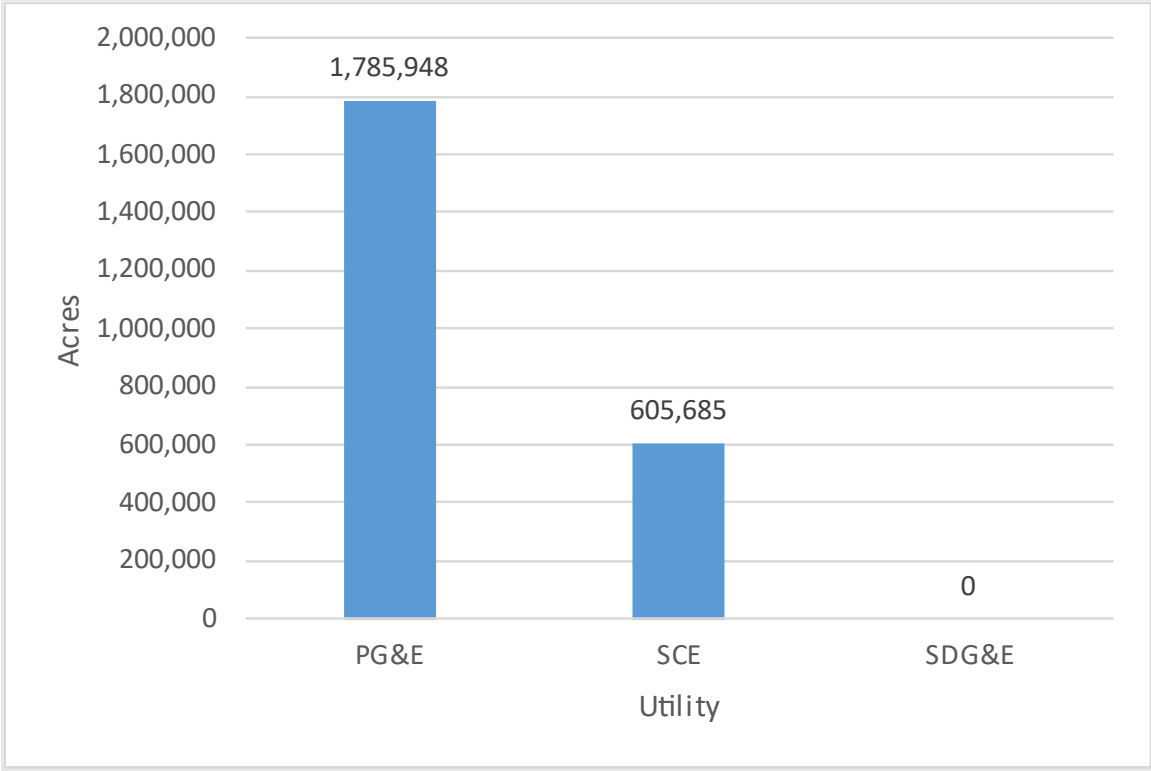
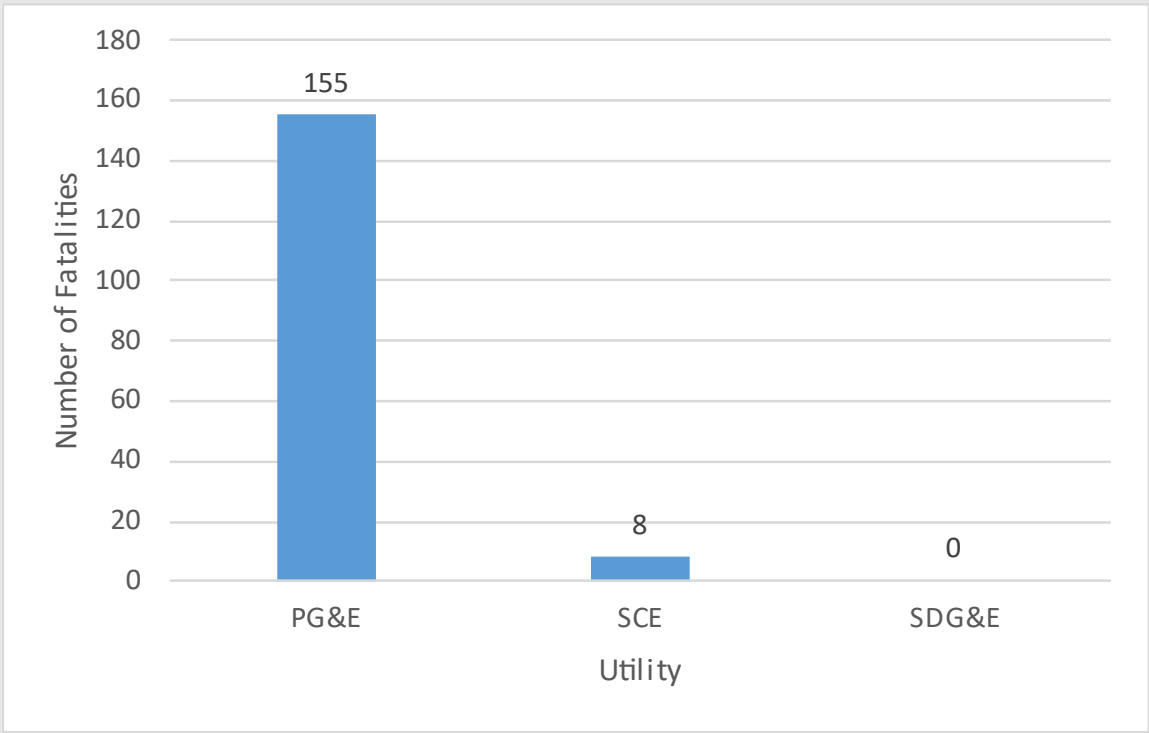


Figure 5.3-3. Cross-Utility Number of Fatalities Caused by Catastrophic Wildfires (2015-2022)



5.4 Community Values at Risk

Section 5.4 of the Technical Guidelines requires SDG&E to identify the community values at risk across its service territory, including the distribution of urban, rural, and highly rural customers; the wildland-urban interface (WUI) in its territory; the community values at risk from wildfire as defined by the electrical corporation; the distribution of critical facilities within its territory; and a summary of how the utility complies with environmental laws.[27]

SDG&E listed the percentages and number of people in its territory that are located in urban, rural, and highly rural areas and briefly summarized where these areas occur in its territory. SDG&E provided a methodology using census tracts from the 2010 Census Data for San Diego and Orange counties to develop urban, rural, and highly rural layers. SDG&E determined population density by dividing the total number of customers by the total square miles of tracts. SDG&E also described where the WUI occurs in its territory and provided a brief narrative where the WUI is identified both within and outside of the HFTD in SDG&E's service territory. Additionally, SDG&E identified mitigations used throughout its service territory in the WUI by providing enhanced asset inspection programs.

[27] Technical Guidelines, Section 5.4, "Community Values at Risk," pages 26-29 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

SDG&E summarized the critical facilities in the HFTD within its territory by listing the critical facilities and infrastructure customers by facility and infrastructure types in HFTD Tiers 2 and 3 in SDG&E Tables 5-1 and 5-2 respectively.[28]

5.4.1 Environmental Compliance and Permitting

Section 5.4.5 of the Technical Guidelines requires SDG&E to summarize how it ensures it complies with applicable environmental laws and permits related to the implementation of its WMP, including its procedures/processes to ensure compliance, roadblocks it has encountered, and any notable changes to its environmental compliance and permitting procedures since the last WMP submission.[29]

New construction and/or large maintenance projects must comply, as necessary, with the California Environmental Quality Act, the Clean Water Act (sections 401 and 404), California Fish and Game Code (section 1602), the National Environmental Policy Act, the National Historic Preservation Act, Forest Practice Act and Rules, among other federal, state, and local requirements. Utilities must also obtain permits from land management agencies such as the National Forest Service, Bureau of Land Management, National Park Service, California Coastal Commission, among others.

The linear nature of utility infrastructure often warrants several permits for one project, including different permit conditions, environmental requirements, and post-work reporting requirements. Compliance with permitting requirements add time and complexity to project planning, cost and mitigations related to environmental analysis and impact, and sometimes result in long-term monitoring or restoration projects. These are all considerations factoring into a utility's project planning and execution.

SDG&E summarized how it plans to ensure compliance with applicable environmental laws, regulations, and permitting requirements in planning wildfire mitigation projects.

5.5 Areas for Continued Improvement

Energy Safety has no areas for continued improvement for SDG&E under the service territory overview section of its Base WMP.

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[28] SDG&E's 2023-2025 WMP, SDG&E Table 5-1 "CFI Customers in Tier 2 of the HFTD," page 43; SDG&E Table 5-2 "CFI Customers in Tier 3 of the HFTD," page 44.

[29] Technical Guidelines, Section 5.4.5, "Environmental Compliance and Permitting," pages 28-29 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

6. Risk Methodology and Assessment

In response to Section 6 of the Technical Guidelines, SDG&E provided information on how it operates its grid to reduce wildfire risk, including in relation to equipment settings, grid response procedures and notifications, and personnel work procedures and training.[30]

Below is Energy Safety's evaluation regarding SDG&E's objectives and targets, maturity levels, and strengths in this area. In addition, Energy Safety has identified areas where SDG&E must improve, described at the end of this section.

6.1 Methodology

Section 6.1 of the Technical Guidelines requires SDG&E to provide an overview of its risk calculation approach, including graphs showing the calculation process, a concise narrative explaining key elements, and definitions of risks and risk components.[31]

This section includes an overview of SDG&E's risk calculation approach.

SDG&E quantifies likelihood of a risk event (LoRe) and consequence or risk of event (CoRe) for identified categories of risk, then multiplies these values to arrive at a risk score. SDG&E then uses the risk score to inform prioritization and selection of mitigation approaches.

6.2 Risk Analysis Framework

Section 6.2 of the Technical Guidelines requires SDG&E to provide a high-level overview of its risk analysis framework, including a summary of key modeling assumptions, input data, and modeling tools used.[32]

This section includes an overview of SDG&E's risk analysis framework.

SDG&E's risk analysis framework consists of six components that are used to identify, evaluate, prioritize, and respond to risk events. The framework forms a cycle that adapts to the changes in the likelihood and possible consequences of a wildfire and continues to

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[30] Technical Guidelines, Section 6, "Risk Methodology and Assessment," pages 30-58 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[31] Technical Guidelines, Section 6.1, "Methodology," pages 30-35 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[32] Technical Guidelines, Section 6.2, "Risk Analysis Framework," pages 36-44 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

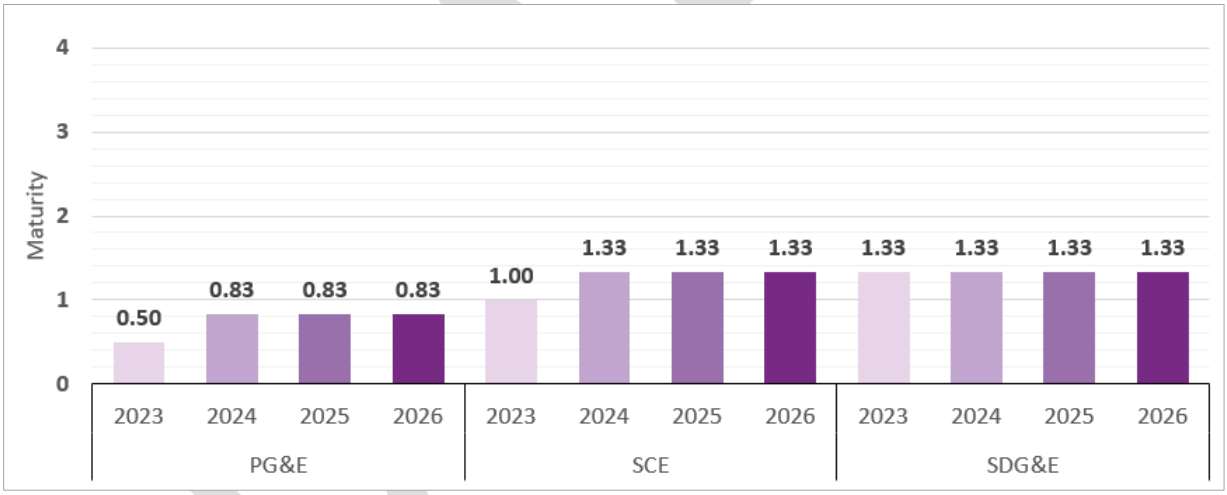
improve with lessons learned, accrued data, model development initiatives, and subject matter expert discretion.

The two primary models applied by SDG&E in its risk analysis framework are the Wildfire Next Generation System for Investment Planning (WiNGS-Planning) model—used to identify, prepare for, and mitigate risks—and the WiNGS Operational (WiNGS-Ops) model—used for near-term risk identification and response.

6.3 Maturity Survey Results

According to its responses to the 2023 Maturity Survey, SDG&E has a 2023 maturity level of 1.33 for risk assessment and mitigation strategy. SDG&E projects no maturity level change for 2024 or 2025 (Figure 6.3-1).

Figure 6.3-1. Cross-Utility Maturity for Risk Assessment and Mitigation Strategy (Minimum Values)

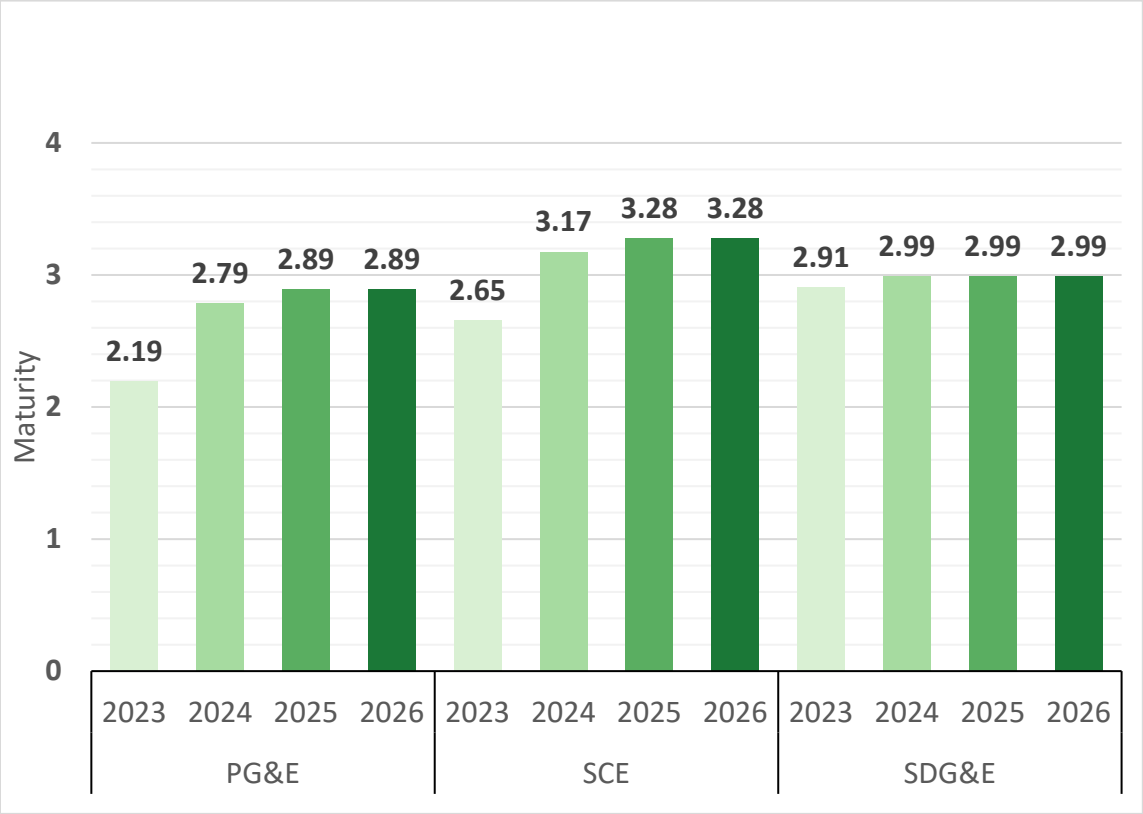


The utility's maturity level for the risk assessment and mitigation strategy category described above is calculated using the minimum value sub-capability of each capability. Using the capability average is another way to look at SDG&E's performance in risk assessment and mitigation strategy. The capability average is determined from the average of all component sub-capabilities and is an additional tool to evaluate the utilities' maturity.[33]

When the category maturity is calculated using the capability average (rather than the minimum), SDG&E has a maturity level for risk assessment and mitigation strategy of 2.91 for 2023 and projects a maturity level of 2.99 in 2024 and 2025 (Figure 6.3-2).

[33] For further information on maturity level determinations, see Section 4 of the 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (second revision), published February 21, 2023.

Figure 6.3-2. Cross-Utility Maturity for Risk Assessment and Mitigation Strategy (Average Values)



The rest of this section reports on maturity levels considering the minimum values.

SDG&E's current maturity level in this category is higher than its peers, with PG&E and SCE reporting at levels 0.5 and 1, respectively. See Figure 6.3-1.

Based on its responses to the 2023 Maturity Survey, SDG&E reported its highest levels of projected maturity in the following capability for 2023 and 2024:

- Risk event tracking and integration of lessons learned[34]

Based on its responses to the 2023 Maturity Survey, SDG&E reported its lowest levels of projected maturity in the following capabilities for 2023 and 2024:

- Statistical weather, climate, and wildfire modeling,[35] specifically in the following sub-capabilities:
    - Comprehensiveness

[34] SDG&E's responses to questions on the 2023 Maturity Survey under Category A "Risk Assessment and Mitigation Strategy," Capability 5 "Risk event tracking and integration of lessons learned."

[35] SDG&E's responses to questions on the 2023 Maturity Survey under Category A "Risk Assessment and Mitigation Strategy," Capability 1 "Statistical weather, climate, and wildfire modeling."

- Modularization
- Validation

6.4 SDG&E's WMP Strengths

SDG&E reports recently implemented enhancements and ongoing research into enhancements for both the WiNGS-Ops and WiNGS-Planning models. The enhancements impact how the models are used as risk mitigation tools, and include the following:

- The inclusion of new data that enhance how the WiNGS-Ops captures the risk of customers with access and functional needs (AFN).[36]
- Ongoing research on multiple potential improvements for its WiNGS-Planning model that will impact data dissemination, scenario design, and mitigation selection.[37] These improvements are:
  - A visualization platform for WiNGS-Planning model outputs.
  - Inclusion of life cycle costs for vegetation management, asset management, and PSPS activations.

SDG&E's ongoing research and adapted improvements demonstrate that it is on a path toward improved risk-reduction decisions.

6.4.1 2022 Areas for Continued Improvement

Energy Safety evaluated the progress SDG&E made toward addressing areas for continued improvement identified in Energy Safety's 2022 WMP Decision. See Appendix B for the status of each 2022 area for continued improvement. Notable progress was made in the following selected area:

- In response to SDGE-22-08, Evaluation of Wildfire Risk Outside of the HFTD, SDG&E discusses how it annually evaluates potential changes and modifications necessary relating to risk outside the HFTD.[38] While no new areas of wildfire risk outside the HFTD were identified, SDG&E provided reasoning for lower fire risk outside of the current HFTD.

6.5 Areas for Continued Improvement

SDG&E must continue to improve in the following areas.

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[36] SDG&E's 2023-2025 WMP, page 37.

[37] SDG&E's 2023-2025 WMP, page 34.

[38] SDG&E's 2023-2025 WMP, Appendix D: Areas for Continued Improvement, page 10.

6.5.1 Cross-Utility Collaboration on Risk Model Development

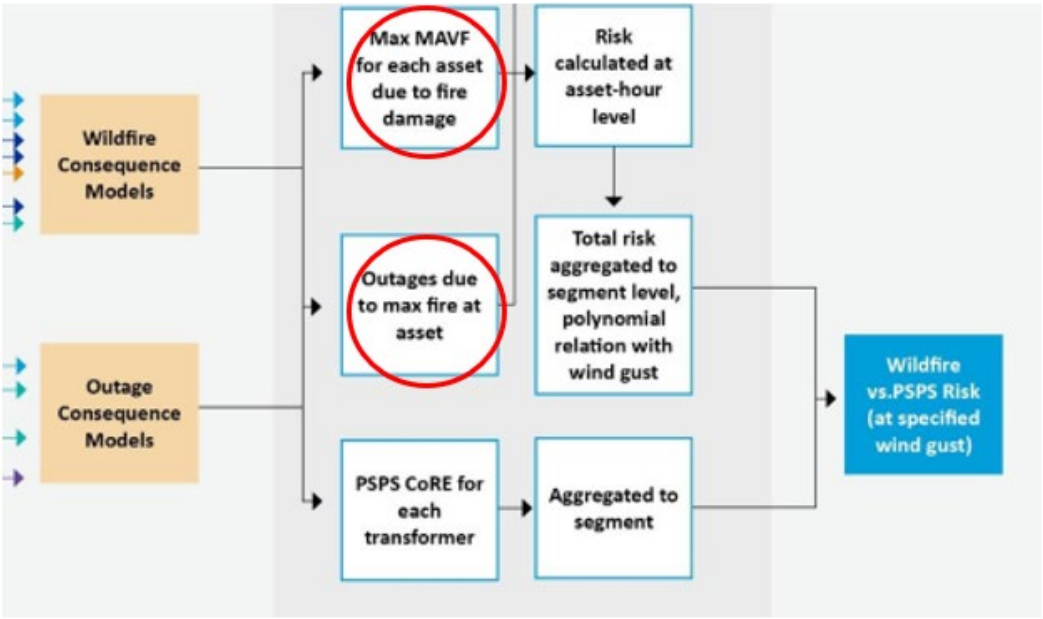
SDG&E and the other IOUs have participated in past Energy Safety-sponsored risk model working group meetings. The risk model working group meetings facilitate collaboration among the IOUs on complex technical issues related to risk modeling. The risk model working group meetings are ongoing. SDG&E and the other IOUs must continue to participate in all Energy Safety-organized risk model working group meetings.

6.5.2 Calculating Risk Scores Using Maximum Consequence Values

SDG&E's use of maximum consequence values at the asset or circuit level could lead to unrealistically high risk scores at the territory level, and this may affect SDG&E's ability to optimally prioritize mitigations. Instead, mathematical standards support aggregating consequence values using probability distributions. When this is not possible, a suitable alternative is using average consequence values (also known as expected value). In its 2025 Update, SDG&E must provide a plan with milestones for transitioning from using maximum consequence values to either probability distributions or averages in its next Base WMP. If SDG&E is unable to transition to using probability distributions or averages, it must explain the reason and propose an alternative strategy that would produce risk scores closer to what using the probability distributions or average consequences would produce.

At present, SDG&E is calculating risk scores based on maximum consequence values at the individual asset or circuit level. SDG&E is using maximums in at least two separate places: "Max for each asset due to fire damage" and "Outages due to max fire at asset." See Figure 6.5-1.

Figure 6.5-1. WiNGS-Ops Calculation Schematic



Furthermore, in response to a data request about SDG&E's use of maximum consequence values, SDG&E stated that "[f]or WiNGS-Planning, the maximum number of Acres and maximum number of Buildings Destroyed estimates are used in the 'WRRM Conditional Impact Model.'"[39]

Aggregating maximum consequence values may lead to an inaccurate risk assessment at the territory level. Consider the "maximum consequence" of a die roll, which is "6." There is a 1 in 6 chance of this maximum consequence occurring on a single roll. Adding the maximum consequence of ten die rolls would result in a total consequence score of 60. However, the actual probability of rolling a "6" ten times in a row is approximately one in sixty million. In other words, adding maximum risks to determine total territory risk will tend to significantly overstate the risk.

6.5.3 PSPS and Wildfire Risk Trade-Off Transparency

Although SDG&E has integrated PSPS into most elements of its WiNGS-Planning and WiNGS-Operations models, SDG&E does not provide adequate transparency regarding how it makes PSPS and wildfire risk trade-offs, or how it uses risk ranking and risk buy-down to determine risk mitigation selection.

[39] Data Request OEIS-P-WMP_2023-SDGE-008 (Question 1) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54503&shareable=true, accessed August 15, 2023).

SDG&E aggregates mitigation impact at the total risk level.[40] Mitigation impact on PSPS risk is less transparent as a result. In its 2025 Update, SDG&E must describe how it prioritizes PSPS risk in its risk-based decisions and any trade-offs between wildfire risk and PSPS risk.

6.5.4 Incorporation of Extreme Weather Scenarios into Planning Models

SDG&E currently relies on a short record of weather data collected from its weather stations for wildfire risk modeling. Weather data (in particular, wind and moisture) are critical inputs to the WiNGS-Planning model. SDG&E states that the WiNGS-Planning model relies on "Weather Condition 1," which is developed from SDG&E's weather station network using maximum observed winds over the period from 2009 to the present.[41] SDG&E uses the WiNGS-Planning model to estimate the value of covered conductor and undergrounding on circuit segments in the HFTD. In its next Base WMP, SDG&E must report on its progress developing statistical estimates of potential wind events over at least the maximum asset life for its system and evaluate results from incorporating these into WiNGS-Planning when developing its mitigation initiative portfolio or explain why the approach would not serve as an improvement to its mitigation strategy.

Exclusive reliance on historic fire weather scenarios is limiting because:

- Fire weather scenarios systematically under-sample high consequence/low probability events.
- Many of the mitigation measures SDG&E is deploying will last longer than 13 years and so are likely to experience an exceedance of the 1-in-13 approach adopted by SDG&E.
- An exceedance of 1-in-13-year historical wind load conditions may lead to exposure of assets that are not located in the HFTD. Using SDG&E's current wind load data, SDG&E may be underestimating risks of ignition and high consequence and therefore not hardening these assets because they are not identified as needing hardening by WiNGS-Planning.
- A database of past events, even 13 years in duration and supplemented with synthetic scenarios, may underestimate risk faced today or in the future. Climate change is intensifying the conditions that lead to catastrophic wildfire in California.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 11.

[40] SDG&E's 2023-2025 WMP, Figure 6-7 "WiNGS-Planning Calculation Schematic," page 96.

[41] SDG&E's 2023-2025 WMP, page 76.

7. Wildfire Mitigation Strategy Development

In response to Section 7 of the Technical Guidelines, SDG&E provided a high-level overview of its risk evaluation and process for deciding on a portfolio of mitigation initiatives to achieve the maximum feasible risk reduction while meeting WMP goals and objectives.[42]

Below is Energy Safety's evaluation regarding SDG&E's objectives and targets, maturity levels, and strengths in this area. In addition, Energy Safety has identified areas where SDG&E must improve, described at the end of this section.

7.1 Risk Evaluation

Section 7.1 of the Technical Guidelines requires SDG&E to describe its approach to risk evaluation based on risk analysis outcomes.[43] The approach should inform the development of a wildfire mitigation strategy that meets WMP goals and objectives.

SDG&E's risk evaluation approach is heavily dependent on data generated by its WiNGS-Planning model, which contains key data elements considered for risk evaluation. This includes segment risk, risk buy-down, and portfolio analysis.

7.1.1 SDG&E's WMP Strengths

SDG&E's WiNGS-Planning tool integrates multiple risk likelihood and consequence models, thereby supporting a risk portfolio perspective that facilitates an analysis of trade-offs between alternatives.

7.1.1.1 2022 Areas for Continued Improvement

Energy Safety evaluated the progress SDG&E made toward addressing areas for continued improvement identified in Energy Safety's 2022 WMP Decision. See Appendix B for the status of each 2022 area for continued improvement. Notable progress was made in the following selected area:

- In response to SDGE-22-01, Prioritized List of Wildfire Risks and Drivers, SDG&E provided an updated list of prioritized wildfire risks and drivers broken down by sub-

[42] Technical Guidelines, Section 7, "Wildfire Mitigation Strategy Development," pages 59-74 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[43] Technical Guidelines, Section 7.1, "Risk Evaluation," pages 59-66 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

category that takes into consideration likelihood of becoming a catastrophic wildfire given an ignition occurs.[44]

7.1.2 Areas for Continued Improvement

SDG&E must continue to improve in the following area.

As noted above in the area for continued improvement "PSPS and Wildfire Risk Trade-Off Transparency" (Section 6.5.3), SDG&E's description of how it prioritizes mitigation initiatives can be further developed and improved.

SDG&E's 2023-2025 WMP does not provide enough detail to understand how SDG&E uses risk ranking and risk buy-down to determine mitigation selection. In its 2025 Update, SDG&E must describe how its prioritization of mitigation initiatives in practice compares to the list of mitigation initiatives ranked by risk buy-down estimate and provide an explanation for any instances where a mitigation initiative with a lower risk buy-down estimate was prioritized over an initiative with a higher risk buy-down estimate.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 11.

7.2 Risk-Informed Framework

Section 4.4 of the Technical Guidelines requires SDG&E to adopt and describe its framework for making risk-informed decisions.[45]

7.2.1 SDG&E's WMP Strengths

SDG&E projects improvement in its risk-informed decision making over the WMP cycle in the following area: risk mitigation and management.

SDG&E has made progress developing a risk reduction approach that incorporates climate change projections, potentially offering insights into how this information may be effectively integrated into utility risk modeling frameworks.[46]

7.2.1.1 2022 Areas for Continued Improvement

Energy Safety evaluated the progress SDG&E made toward addressing areas for continued improvement identified in Energy Safety's 2022 WMP Decision. SDG&E made sufficient

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[44] SDG&E's 2023-2025 WMP, Appendix D: Areas for Continued Improvement, pages 1-2.

[45] Technical Guidelines, Section 4.4 "Risk-Informed Framework," pages 11-14 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[46] SDG&E's 2023-2025 WMP, page 122.

progress in its 2022 area for continued improvement in risk-informed framework-related issues. See Appendix B for the status of each 2022 area for continued improvement.

7.2.2 Areas for Continued Improvement

SDG&E must continue to improve in the following area.

7.2.2.1 Cross-Utility Collaboration on Best Practices for Inclusion of Climate Change Forecasts in Consequence Modeling, Inclusion of Community Vulnerability in Consequence Modeling, and Utility Vegetation Management for Wildfire Safety

SDG&E must make further improvements in the area of cross-utility collaboration on best practices for the inclusion of climate change forecasts in consequence modeling, inclusion of community vulnerability in consequence modeling, and utility vegetation management for wildfire safety. Although SDG&E joined the other IOUs in participating in Energy Safety-sponsored scoping meetings in the past, they have not reported additional collaboration. In their 2025 Updates, the IOUs (not including independent transmission operators) must provide a status update on any collaboration with each other that has taken place in these areas, including a list of any resulting changes made to their WMPs since the 2023-2025 WMP submission.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 11.

7.3 Wildfire Mitigation Strategy

Section 7.2 of the Technical Guidelines requires SDG&E to describe its proposed wildfire mitigation strategies based on the evaluation process identified in Section 7.1 of its WMP.[47]

7.3.1 Maturity Survey Results

According to its responses to the 2023 Maturity Survey, SDG&E has a 2023 maturity level of 3.14 for risk prioritization. SDG&E projects no maturity level change for 2024 or 2025 (Figure 7.3-1).

Note that cross-category themes are calculated by averaging the relevant sub-capability maturity levels.[48]

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[47] Technical Guidelines, Section 7.2, pages 66-74 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

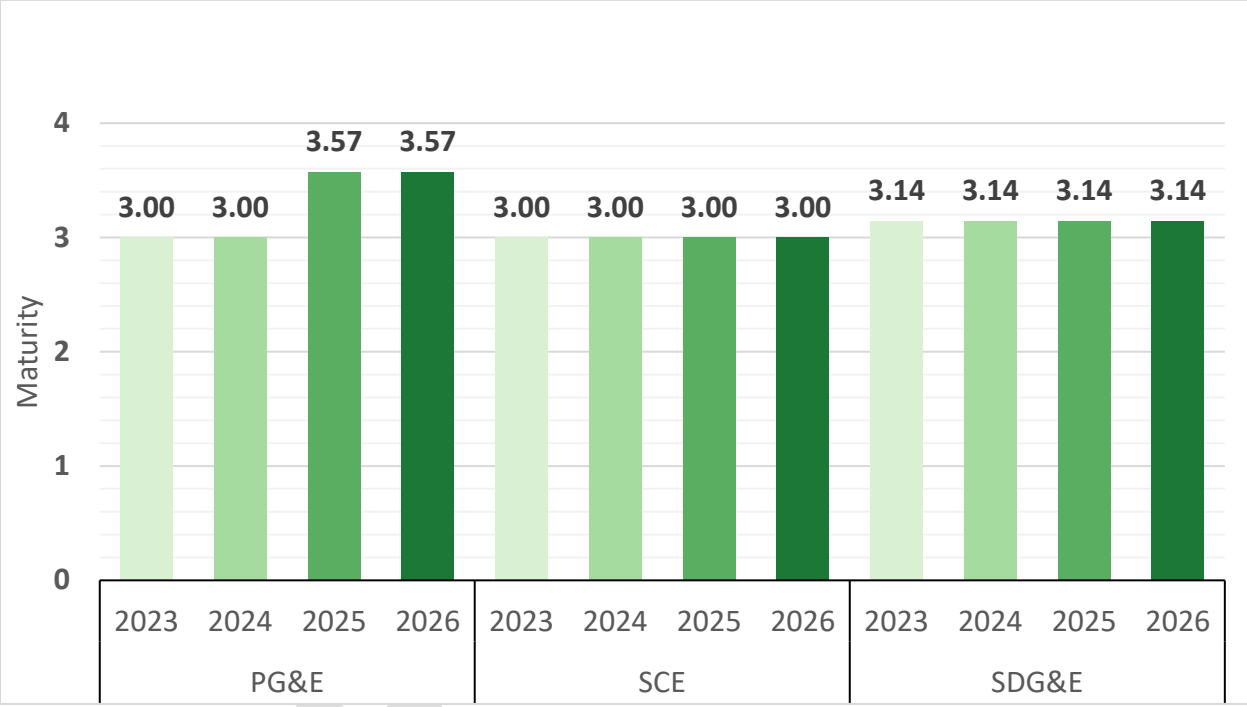
[48] 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (Second Revised Final, Feb. 2023) page 13 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53394&shareable=true, accessed May 5, 2023).

SDG&E's maturity level in this cross-category theme is limited by its response to the following question:

- SDG&E reports that it does not prioritize inspection frequency based on risk modeling considering species-specific vegetation growth and equipment type for each circuit of the service territory.[49] To advance in maturity on this question, SDG&E must prioritize inspection frequency in this manner.

SDG&E's current maturity level in this cross-category theme is around the same as its peers, with both SCE and PG&E reporting at a level 3. See Figure 7.3-1.

Figure 7.3-1. Cross-Utility Maturity for Risk Prioritization (Cross-Category Theme; Average Values)



7.3.2 SDG&E's WMP Strengths

SDG&E conducts ongoing studies to measure the effectiveness of mitigation initiatives. These studies assess the impact of mitigations such as sensitive relay settings, inspection programs, special work procedures, and contract fire resources on ignitions.[50] The studies serve as an

[49] SDG&E's 2023 Maturity Survey, response to 4.2.1.Q5.

[50] SDG&E's 2023-2025 WMP, pages 118-119.

integral part of SDG&E's ongoing risk-reduction initiatives, helping to quantify the relative effectiveness of different mitigations.

7.3.2.1 2022 Areas for Continued Improvement

Energy Safety evaluated the progress SDG&E made toward addressing areas for continued improvement identified in Energy Safety's 2022 WMP Decision. SDG&E made sufficient progress in its 2022 area for continued improvement in wildfire mitigation strategy-related issues. See Appendix B for the status of each 2022 area for continued improvement.

7.3.3 Areas for Continued Improvement

SDG&E must continue to improve in the following areas.

7.3.3.1 Demonstration of Proper Decision Making for Selection of Undergrounding Projects

SDG&E is often prioritizing undergrounding compared to other mitigations through its mitigation decision-making process and does not provide adequate justification for its undergrounding projects. For instance, SDG&E's WiNGS-Planning Model, which SDG&E uses to prioritize mitigation initiatives, does not currently incorporate the time value of risk (i.e., risk caused by long deployment timeframes) into its valuation of mitigation initiatives. Excluding this factor may bias mitigation investments toward undergrounding, which provides the most risk reduction but requires a substantially longer deployment timeframe than other mitigation initiatives, including covered conductor plus early fault detection, sensitive relay profile settings, and sensitive ground fault relay settings, potentially leaving customers exposed to unmitigated risks for extended periods. SDG&E also does not demonstrate its analysis of risk drivers for a specific location, and instead appears to default to undergrounding during its selection process. For instance, a particular location may not have much risk from vegetation contacts given low tree density, or have a primary risk driven by third-party contacts such as balloons and vehicles. This may not properly account for instances where other mitigations could adequately cover the risk at a similar effectiveness as undergrounding with a higher efficiency of resource usage.

In its 2025 Update, SDG&E must provide an analysis demonstrating its process for the selection of undergrounding projects, including an analysis of location-specific ignition drivers, a comparison of undergrounding effectiveness compared to combinations of other mitigations, an estimate of the cumulative risk exposure of its mitigation portfolio taking into account the time value of risk, and adjustments to SDG&E's hardening scope in light of this analysis.

7.3.3.2 Third-Party Recommendations for Model Improvements

Although SDG&E retained a third-party consultant to review its WiNGS-Planning model, its 2023-2025 WMP did not include a plan to implement the consultant's recommended improvements to its model.

In its 2025 Update, SDG&E must provide an update on its implementation of the consultant's recommended improvements regarding the inclusion of SDG&E's Vegetation Risk Index, use of its risk model to inform mitigation work outside of grid hardening, sensitivity analysis for risk buy-down, mitigations, and PSPS models, and the elimination of double-counting of conductor age and circuit health index within models. SDG&E must also provide a list of recommendations from the Table of Recommendations in its consultant's May 2023 report[51] that it is adopting with the timeline for each recommendation's implementation and a list of recommendations it is not adopting, if any, with an explanation on why SDG&E is not adopting a recommendation.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 11.

[51] PA Consulting (May 2023). WiNGS-Planning Assurance Report, Appendix A: Table of Recommendations, pages 27-33. (https://www.sdge.com/sites/default/files/regulatory/MGRA-2023-06%20Attachment%20Q1.pdf, accessed July 28, 2023).

8. Wildfire Mitigation Initiatives

This section comprises Energy Safety's evaluation of the mitigation initiatives SDG&E undertakes to reduce the risk of catastrophic wildfire. For each mitigation initiative this section provides an analysis of SDG&E's maturity level, the ways SDG&E is progressing and specific areas where SDG&E must continue to improve.

The following mitigation initiatives, each with corresponding capabilities and maturity levels, are discussed in Sections 8.1 through 8.6.

- Grid design, operations, and maintenance, including grid design and system hardening, asset inspections, equipment maintenance and repair, and grid operations and procedures
- Vegetation management and inspections
- Situational awareness and forecasting
- Emergency preparedness
- Community outreach and engagement

SDG&E's approach to PSPS is discussed in Section 9. SDG&E's process for continuous improvement, including lessons learned, corrective action programs, and notices of violation and defect, are discussed in Section 10.

8.1 Grid Design, Operations, Maintenance

In response to Section 8.1 of the Technical Guidelines,[52] SDG&E provided information about its grid design and system hardening; asset inspections; equipment maintenance and repair; asset management and inspection enterprise systems; quality assurance and quality control; open work orders; grid operations and procedures; and workforce planning.

Below is Energy Safety's evaluation regarding SDG&E's objectives and targets, maturity levels, and strengths in these areas. In addition, Energy Safety has identified areas where SDG&E must improve, described at the end of each subsection.

[52] Technical Guidelines, Section 8.1, pages 75-93 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

8.1.1 Objectives and Targets

As part of its Base WMP, SDG&E provided 3-year and 10-year objectives for its grid design, operations, and maintenance programs.[53]

SDG&E revised its grid design and system hardening objectives in its Non-Substantive Errata.[54] The objectives were minimally revised. For example, SDG&E corrected the section number for its supervisory control and data acquisition (SCADA) program within OEIS Table 8-1 "Grid Design, Operations, and Maintenance Objectives (3-year plan)," revised the title of SDG&E Table 8-7 to correctly reflect Early Fault Detection (instead of Early Fault Protection) and corrected various tracking ID numbers within OEIS Table 8-3 "Grid Design, Operations, and Maintenance Targets by Year."

In its original 2023-2025 WMP submission, SDG&E defined quantitative targets for initiative activities for grid design, operations, and maintenance programs. SDG&E also includes end-of-year targets for 2023, 2024, and 2025. Selected targets are included in Table 8.1-1 to demonstrate the utility's projected progress.

Table 8.1-1. SDG&E Grid Design, Operations, and Maintenance –Selected Targets[55]

Initiative Activity	Target Unit	2023 Target	2024 Target	2025 Target
Strategic Undergrounding	Miles undergrounded	84	125	150
Covered Conductor	Miles installed	60	60	40
Transmission OH Hardening	Miles hardened	14.1	10.2	10.2
Early Fault Detection	Nodes installed	60	60	60
Hotline Clamps	Clamps replaced	250	250	0
Expulsion Fuse Replacement	Fuses replaced	40	0	0

[53] SDG&E's 2023 WMP, OEIS Table 8-1 "Grid Design, Operations, and Maintenance Objectives (3-year plan)," pages 133-138; OEIS Table 8-2 "Grid Design, Operations, and Maintenance Objectives (10-year plan)," pages 138-142.

[54] SDG&E 2023-2025 Wildfire Mitigation Plan Non-Substantive Errata (April 26, 2023)(https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53714&shareable=true, accessed July 17, 2023). See the public version of the revised 2023-2025 WMP including these non-substantive errata changes (https://www.sdge.com/sites/default/files/regulatory/2023-2025%20SDGE%20WMP%20with%20Attachments_0.pdf, accessed July 17, 2023).

[55] SDG&E's 2023-2025 WMP, OEIS Table 8-3 "Grid Design, operations, and Maintenance Targets by Year," pages 142-144.

8.1.2 Grid Design and System Hardening

Section 8.1.2 of the Technical Guidelines requires SDG&E to provide information on how it designs its system to reduce ignition risk and what it is doing to strengthen its distribution, transmission, and substation infrastructure to reduce the risk of utility-related ignitions resulting in catastrophic wildfires.[56]

8.1.2.1 Maturity Survey Results

According to its responses to the 2023 Maturity Survey, SDG&E has a 2023 maturity level of 1 for grid design and resiliency. SDG&E projects no maturity level change for 2024 or 2025 (Figures 8.1-1 and 8.1-2).

Figure 8.1-1. Cross-Utility Maturity for Grid Design and Resiliency[57] (Minimum Values)

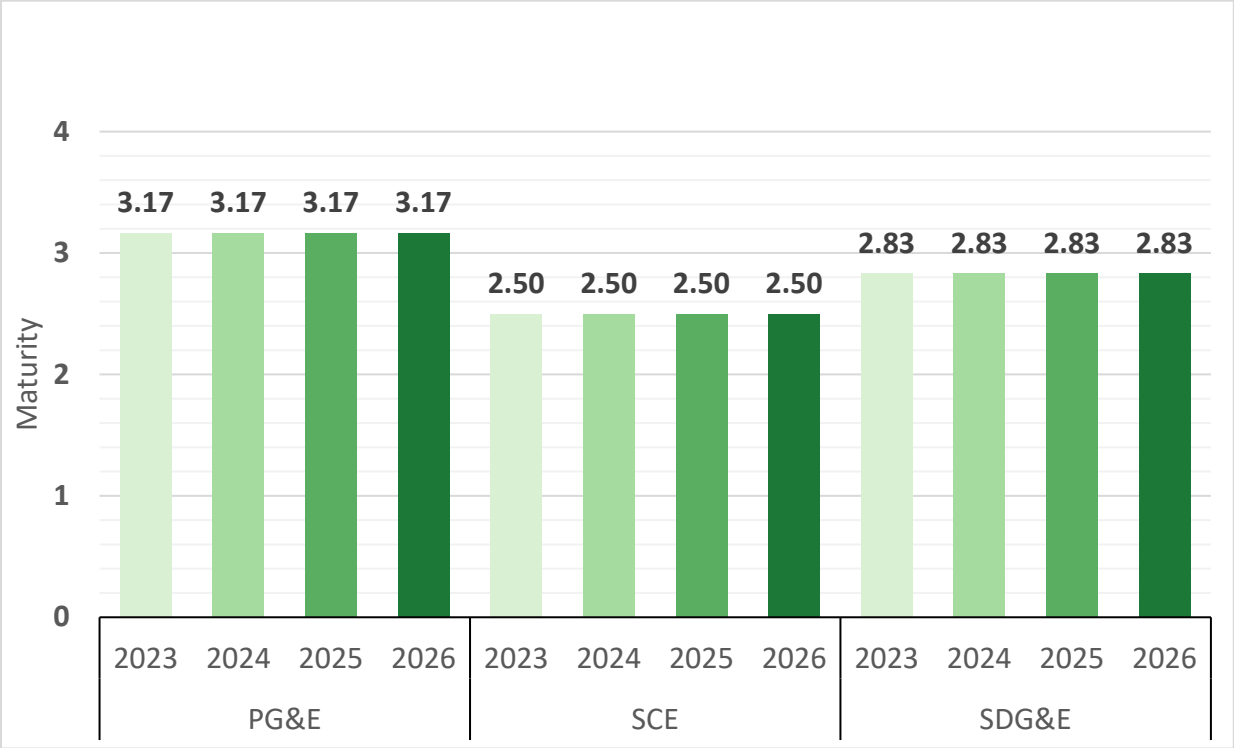
[56] Technical Guidelines, Section 8.1.2, page 82 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[57] 2023 Maturity Survey Category C "Grid Design, Inspections, and Maintenance," Capability 16 "Grid design and resiliency."

The utility's maturity level for the grid design and system hardening capability described above is calculated using the minimum value of component sub-capabilities. The capability average is another way to look at SDG&E's performance in grid design and system hardening. The capability average is determined from the average of all component sub-capabilities and is an additional tool to evaluate the utilities' maturity. [58]

When the capability maturity is calculated using the average (rather than the minimum), SDG&E has a maturity level for grid design and system hardening of 2.83 for 2023. SDG&E projects no maturity level change for 2024 or 2025 (Figure 8.1-2).

Figure 8.1-2. Cross-Utility Maturity for Grid Design and Resiliency[59] (Average Values)



The rest of this section reports on maturity levels considering the average values.

SDG&E's maturity level in this category is limited by its response to the following questions:

[58] For further information on maturity level determinations, see Section 4 of the 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (second revision), published February 21, 2023.

[59] 2023 Maturity Survey Category C "Grid Design, Inspections, and Maintenance," Capability 16 "Grid design and resiliency."

- SDG&E reports evaluating grid design and circuit load assessments on only an annual basis.[60] To increase maturity level, SDG&E would need to evaluate these every six months or quarterly.
- SDG&E reports that new initiatives pursued by SDG&E are not validated by independent auditing of grid performance.[61] To increase maturity level, SDG&E would need to include such validation.
- SDG&E reports that it evaluates new initiatives risk reduction impact at a circuit level granularity.[62] To increase maturity level, SDG&E would need to evaluate this at a span or asset level.
- SDG&E reports that it evaluates its grid design at a segment level.[63] To increase maturity level, SDG&E would need to evaluate this at an asset level.

SDG&E's current maturity level in this capability is higher than one peer and lower than one peer, with PG&E and SCE reporting at levels 3.17 and 2.5, respectively. See Figure 8.1-2.

8.1.2.2 SDG&E's WMP Strengths

SDG&E projects improvement in grid design and system hardening over the WMP cycle in the following areas: microgrids, advanced protection including wire down detection.

SDG&E plans to complete four microgrids by 2024. This includes microgrids at Cameron Corners, Butterfield Ranch, Shelter Valley, and an as-yet unnamed off-grid solution.[64] SDG&E reports using its WiNGS-Planning model for evaluation of potential areas that would be viable for a microgrid location. SDG&E is also evaluating use of remote grid technologies as a potential solution in the future and has multiple mobile battery solutions to alleviate PSPS impacts.[65]

SDG&E reports that it continues to expand its advanced protection program suite. This includes the following technologies:[66]

- Falling conductor protection
- Sensitive ground fault protection
- Sensitive relay profile (SRP) settings

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[60] SDG&E's 2023 Maturity Survey, responses to 3.4.1.Q1. and 3.4.1.Q2.

[61] SDG&E's 2023 Maturity Survey, response to 3.4.2.Q7.

[62] SDG&E's 2023 Maturity Survey, response to 3.4.2.Q9.

[63] SDG&E's 2023 Maturity Survey, response to 3.4.5.Q6.

[64] SDG&E's 2023-2025 WMP, page 162.

[65] SDG&E's 2023-2025 WMP, pages 162-163.

[66] SDG&E's 2023-2025 WMP, pages 163-164.

- High-accuracy fault location
- Remote relay event retrieval and reporting
- SCADA communication
- Increased sensitivity and speed of transmission protection systems
- Protection integration with telecommunication

As part of its advanced protection program, SDG&E reports that it is implementing wire down detection (WDD) technology, which can provide a close to real-time ("near-time") analysis of circuit events.[67] SDG&E is still in the testing phase for this technology but estimates that usage would improve reliability since incidents would be automatically detected and allow for quick response. SDG&E also intends to use its existing advanced metering infrastructure (AMI) to identify and predict issues with failing transformers and potential vegetation-related faults.

2022 Areas for Continued Improvement

Energy Safety evaluated the progress SDG&E made toward addressing areas for continued improvement identified in Energy Safety's 2022 WMP Decision. See Appendix B for the status of each 2022 area for continued improvement. Notable progress was made in the following selected areas:

- In response to SDGE-22-14, Grid Hardening Decision-Making Process Transparency, SDG&E provided more details on how it uses its WiNGS-Planning to determine whether a circuit segment will be undergrounded, have covered conductor installed, or not have any hardening mitigation. SDG&E also provided additional details on the desktop considerations definitions and meanings.[68]
- In response to SDGE-22-15, Undergrounding Risk-Spend Efficiency Demonstration, SDG&E provided details on its RAMP process and points toward its Risk Quantification Framework. Additionally, SDG&E lays out the specific ignition drivers covered conductor and undergrounding help prevent.[69]

8.1.2.3 Areas for Continued Improvement

SDG&E must continue to improve in the following areas.

Continuation of Grid Hardening Joint Studies

Since 2021, utilities have worked in close collaboration with one another to further evaluate and analyze covered conductor, including effectiveness calculations, maintenance and

[67] SDG&E's 2023-2025 WMP, page 166.

[68] SDG&E's 2023-2025 WMP, Appendix D, pages 17-19.

[69] SDG&E's 2023-2025 WMP, Appendix D, pages 20-21.

inspection practices, and implementation of new technologies.[70] This collaboration has brought insights on best practices for utilities to adopt, as well as spread workload on testing new technologies and sharing results from both lab studies and in-field applications. All of these instances of collaboration are outlined in the Joint IOU Covered Conductor Working Group Report supplied as an attachment to all utilities' 2023-2025 WMPs.

While such collaboration has proven beneficial, SDG&E has not yet applied all lessons learned from other utilities. Additionally, many areas still need deeper exploration and would benefit from joint utility efforts, such as efforts related to undergrounding, use of protective equipment and device settings, and continued efforts evaluating new technologies.

In its 2025 Update, SDG&E must work with other utilities to continue collaborating on grid hardening efforts to share lessons learned and determine best practices. In its next Base WMP, SDG&E, along with other utilities, must submit a report that discusses continued efforts, including lessons learned.

New Technologies Evaluation and REFCL Implementation

SDG&E does not include in its WMP any discussion of its exploration into rapid earth fault current limiters (REFCL) as a potential mitigation, instead stating that it does not employ REFCL. The area for continued improvement identified in Energy Safety's 2022 WMP Decision SDGE-22-13, New Technologies Evaluation and Implementation, required SDG&E to evaluate the effectiveness of new technologies such as REFCL through collaboration with other utilities, including implementation strategies.

In its 2025 Update, SDG&E must provide an update on its progress evaluating the use of REFCL as a mitigation or provide an explanation why SDG&E finds REFCL not logical and/or feasible to use as a mitigation. This is important particularly given the potential risk reduction benefits of REFCL when paired with other mitigations such as covered conductor.

Early Fault Detection Implementation

As seen in Table 8.1-1 "SDG&E Grid Design, Operations, and Maintenance – Selected Targets," SDG&E plans to install early fault detection (EFD) technology at 180 locations during this WMP cycle. While SDG&E did not directly implement its WiNGS-Planning model for prioritization for EFD, SDG&E did prioritize EFD in areas that are not expected to be "significantly hardened" in the next few years.[71]

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[70] As required through SDGE-21-03 in the Action Statement on SDG&E's 2021 WMP, and then SDGE-22-11 and SDGE-22-13 in the Final Decision on SDG&E's 2022 WMP.

[71] Data Request OEIS-P-WMP_2023-SDGE-006 (Question 1) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54207&shareable=true, accessed July 17, 2023); spreadsheet "OEIS202306_Attachment_Q1" (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54208&shareable=true, accessed July 17, 2023).

In its 2025 Update, SDG&E must provide an analysis of using EFD in combination with other hardening efforts such as covered conductor. This approach can have benefits in areas that have not been hardened, particularly given the relative speed with which EFD can be deployed. SDG&E must also document the performance of deployed EFD in identifying incipient faults and document any instances where the early fault detection sensors successfully prevented or mitigated a potential ignition. Additionally, SDG&E must provide additional details on any maintenance requirements related to EFD.

Changes to Scope of Falling Conductor Protection Program

SDG&E states that some of the circuits targeted for falling conductor protection (FCP) were removed from the scope of the FCP initiative—"descoped"—in favor of undergrounding.[72] SDG&E does not provide adequate information regarding why such projects were descoped.

FCP is part of the advanced protection technologies SDG&E uses for system automation equipment. FCP is "designed to trip distribution and transmission overhead circuits before broken conductors can reach the ground energized."[73] SDG&E has found FCP pilots to be successful in detecting broken conductor and plans to install FCP on 21 circuits between 2023 and 2025.

In its 2025 Update, SDG&E must provide further information on the circuit segments being descoped for FCP in favor of undergrounding. This must include a list of projects that were descoped, including circuit segment name/ID, length, and associated risk score, demonstration of considerations for cost/benefit analysis, deployment time, interim mitigation needs, and mitigation effectiveness for reducing ignition risk (including FCP in combination with covered conductor), and SDG&E's adjustments to FCP targets based on the above analysis, if applicable.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 11.

8.1.3 Asset Inspections

Section 8.1.3 of the Technical Guidelines requires SDG&E to provide an overview of its procedures for inspecting its assets.[74]

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[72] SDG&E's 2023-2025 WMP, Appendix D, page 22.

[73] SDG&E's 2023-2025 WMP, page 163.

[74] Technical Guidelines, Section 8.1.3, page 83-85 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

8.1.3.1 Maturity Survey Results

According to its responses to the 2023 Maturity Survey, SDG&E has a 2023 maturity level of 3 for asset inspections. For 2024, SDG&E projects the same maturity level. For 2025, SDG&E projects that it will increase in maturity to a level of 4 (Figures 8.1-3 and 8.1-4).

Figure 8.1-3. Cross-Utility Maturity for Asset Inspections[75] (Minimum Values)

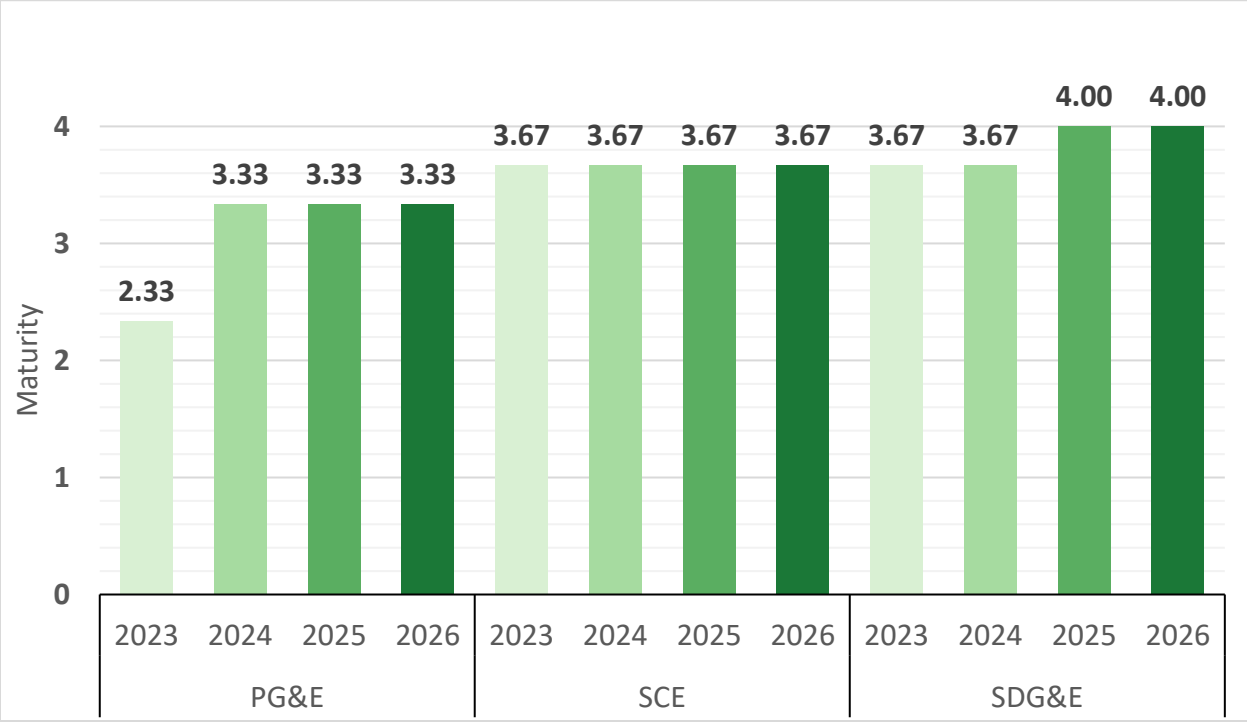
The utility's maturity level for the asset inspections capability described above is calculated using the minimum value of component sub-capabilities. The capability average is another way to look at SDG&E's performance in asset inspections. The capability average is determined from the average of all component sub-capabilities and is an additional tool to evaluate the utilities' maturity.[76]

[75] 2023 Maturity Survey Category C "Grid Design, Inspections, and Maintenance," Capability 14 "Asset inspections."

[76] For further information on maturity level determinations, see Section 4 of the 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (second revision), published February 21, 2023.

When the capability maturity is calculated using the average (rather than the minimum), SDG&E has a maturity level for asset inspections of 3.67 for 2023, 3.67 in 2024, and 4 in 2025 (Figure 8.1-4).

Figure 8.1-4. Cross-Utility Maturity for Asset Inspections[77] (Average Values)



The rest of this section reports on maturity levels considering the average values.

SDG&E's maturity level in this category is limited by its response to the following question:

- SDG&E provided that its distribution inspection content is not independently determined by predictive modeling of equipment failure probability. SDG&E projects that it will do so by 2025.[78]

Across the three-year WMP cycle, SDG&E shows improvement over the first year and then remains consistent for the last year.

SDG&E's current maturity level in this capability is around the same as one peer and higher than the other peer, with SCE and PG&E reporting at levels 3.67 and 2.33, respectively. See Figure 8.1-4.

[77] 2023 Maturity Survey Category C "Grid Design, Inspections, and Maintenance," Capability 14 "Asset inspections."

[78] SDG&E's 2023 Maturity Survey, response to 3.2.1.Q10.

8.1.3.2 SDG&E's WMP Strengths

SDG&E projects improvement in asset inspections over the WMP cycle in drone inspections and LiDAR inspections.

SDG&E reports that it is using an Inspection Prioritization Model to inform the scope of its drone inspection program starting in 2023. Additionally, SDG&E reports advancing its drone program using machine learning models, which includes 48 asset detection models and 24 damage detection models.[79] SDG&E states that these models help automatically assess the large number of images collected via drones, therefore optimizing the program and freeing up resources.

SDG&E also reports that it completed its LiDAR inspections for all HFTD circuits in 2022. Given that its entire HFTD was captured, SDG&E does not plan on implementing another LiDAR collection initiative for several years. SDG&E states that it is using LiDAR data to perform pole loading calculations for system hardening projects, as well as processing corrective work orders.

2022 Areas for Continued Improvement

Energy Safety evaluated the progress SDG&E made toward addressing areas for continued improvement identified in Energy Safety's 2022 WMP Decision. See Appendix B for the status of each 2022 area for continued improvement. Notable progress was made in the following selected area:

- In response to SDGE-22-17, Further Development of Integrating Risk-Informed Decision Making for Inspection Scheduling and Planning, SDG&E states that it is using risk models to inform its drone inspections and may use risk models to modify intrusive pole inspections in the future.[80]

8.1.3.3 Areas for Continued Improvement

SDG&E must continue to improve in the following areas.

Covered Conductor Inspection and Maintenance

Although SDG&E states that it will continue to participate in covered conductor meetings and workshops with other utilities in 2023 and lists inspection practices as a topic to be

[79] SDG&E's 2023-2025 WMP, page 199.

[80] "…SDG&E has implemented the risk-informed Drone Investigation, Assessment and Repair (DIAR) Program. […] SDG&E is also evaluating the use of risk models to inform distribution intrusive inspections for both wood and steel structures. Although the evaluation is ongoing, it is yet to be determined whether intrusive inspections will be modified based on risk modeling." SDG&E's 2023-2025 WMP, Appendix D, page 23.

discussed,[81] SDG&E has yet to modify its inspection and maintenance procedures to specifically address covered conductor.[82] In particular, SDG&E has not identified any changes that it will make to its inspection practices to address covered conductor failure modes. In its 2025 Update, SDG&E must discuss how it will account for failure modes unique to covered conductor in its inspections. For example, one failure mode identified during the covered conductor joint workshops is corrosion caused by water intrusion.[83] For covered conductor, a visual inspection is unlikely to reveal this failure, necessitating a different approach.

If SDG&E determines no changes to its inspection and maintenance procedures are necessary, then it must discuss how its current inspection and maintenance procedures adequately address covered conductor failure modes.

QA/QC for Inspections

SDG&E is not adequately capturing findings when determining QA/QC pass rates for inspections. This may be related to the fact that SDG&E ended its QA/QC inspections in 2022 and replaced them with risk-informed drone inspections.[84] While drone inspections are useful to supplement routine inspections, SDG&E must demonstrate that its personnel are continuing to properly perform routine distribution inspections.

Additionally, SDG&E has zero audit findings from 2019 through 2021 for its QA/QC of detailed distribution inspections, stating that it "does not define any variances in findings as a failure since it is not possible to determine whether the condition was present at the time of inspection."[85] SDG&E should still be tracking these nonconformances[86] and using that information to inform QA/QC audit results. Some of these findings may have been present at the time of the inspection, and SDG&E may be missing important trends by not evaluating these findings.

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[81] SDG&E's 2023-2025 WMP, Joint IOU Covered Conductor Working Group Report, page 8.

[82] Data Request OEIS-P-WMP_2023-SDGE-002 (Question 5) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54137&shareable=true, accessed July 17, 2023).

[83] Exponent (2022). Effectiveness and Implementation Considerations of Covered Conductors: Testing and Analysis, pages 42-79 (https://www.pge.com/pge_global/common/pdfs/safety/emergency-preparedness/natural-disaster/wildfires/wildfire-mitigation-plan/supporting-documents/effectiveness-and-implementations-considerations-of-covered-conductors-testing-and-analysis.pdf, accessed July 17, 2023).

[84] Data Request OEIS-P-WMP_2023-SDGE-002 (Question 6[b]) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54137&shareable=true, accessed July 17, 2023).

[85] Data Request CALADVOCATES-SDGE-2023WMP-13 (Question 7) (https://www.sdge.com/sites/default/files/regulatory/CalPA-2023-13.pdf, accessed July 17, 2023).

[86] See General Order (GO) 95 Rule 18 for more information (https://ia.cpuc.ca.gov/gos/GO95/go_95_rule_18.htm, accessed August 22, 2023).

In its 2025 Update, SDG&E must describe how it has augmented its current QA/QC program to include desktop review or demonstrate that drone inspections alone adequately cover QA/QC for detailed inspections. It must also discuss how all findings during QA/QC audits inform SDG&E's changes to inspections moving forward and provide data analysis on work orders found during QA/QC audits of asset inspections from 2021-2023.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 11.

8.1.4 Equipment Maintenance and Repair

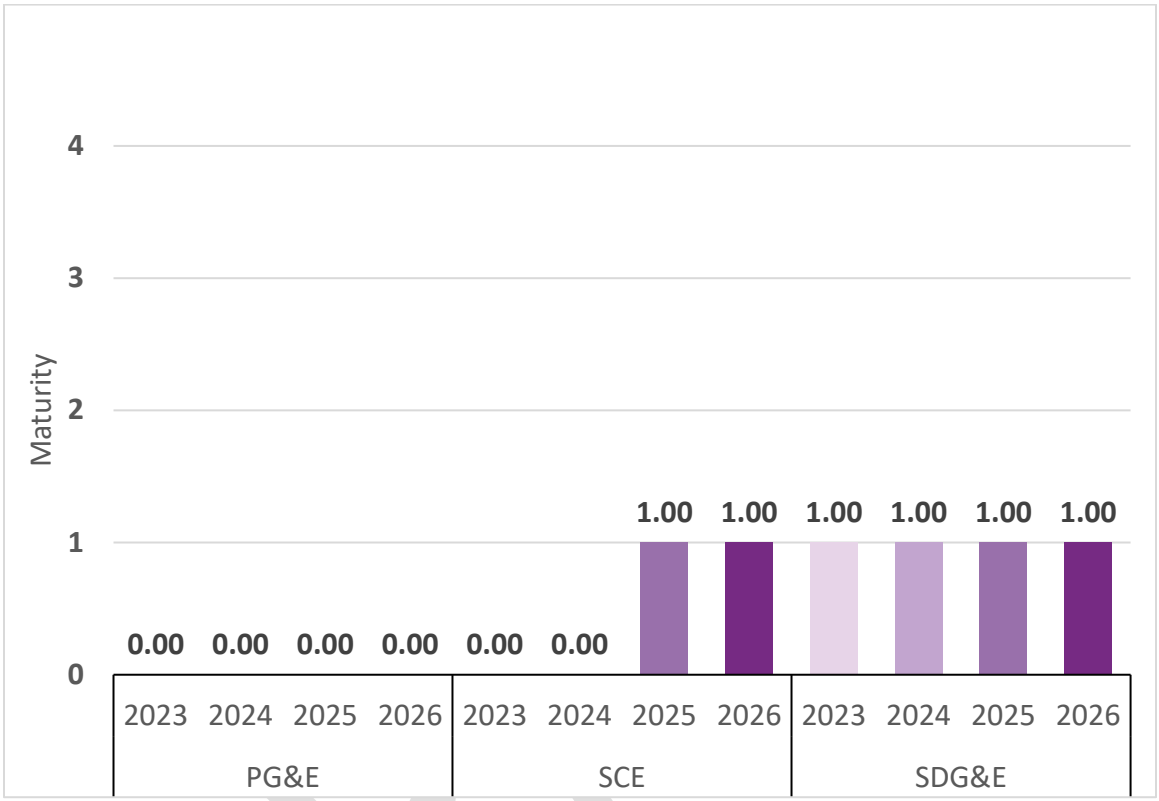
Section 8.1.4 of the Technical Guidelines requires SDG&E to provide a narrative of its maintenance programs, including its strategy for replacing/upgrading and for specific equipment types.[87]

8.1.4.1 Maturity Survey Results

According to its responses to the 2023 Maturity Survey, SDG&E has a 2023 maturity level of 1 for asset maintenance and repair. SDG&E projects no maturity level change for 2024 or 2025 (Figures 8.1-5 and 8.1-6).

[87] Technical Guidelines, Section 8.1.4, pages 85-86 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

Figure 8.1-5. Cross-Utility Maturity for Asset Maintenance and Repair[88] (Minimum Values)



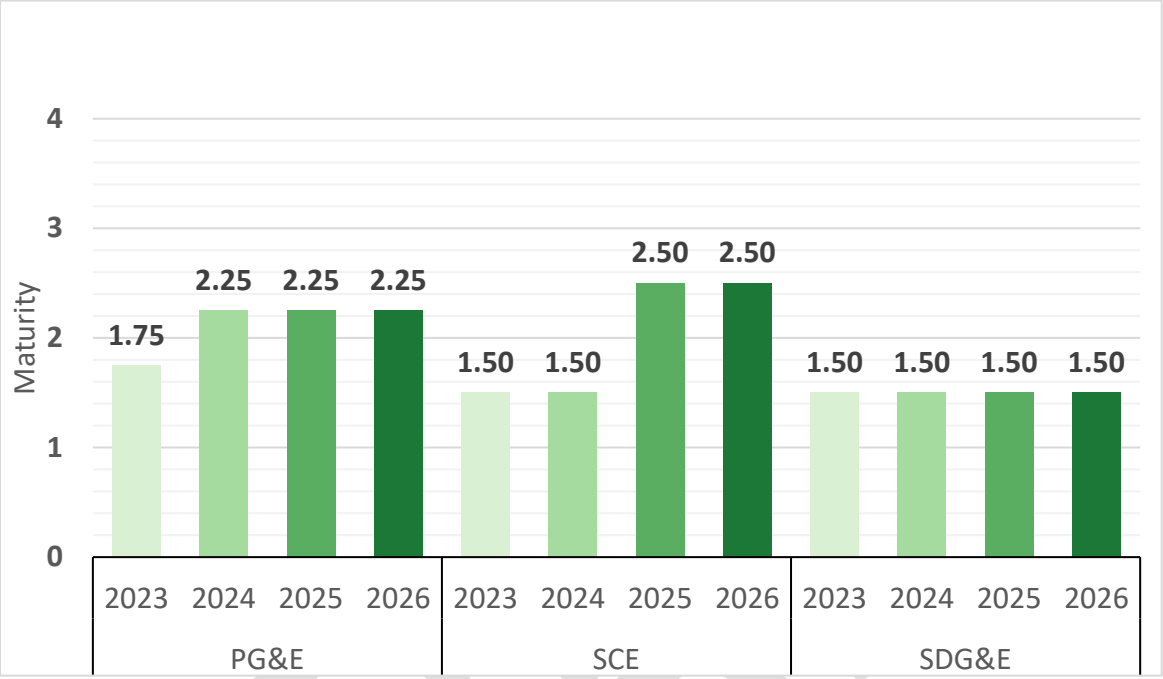
The utility's maturity level for the asset maintenance and repair capability described above is calculated using the minimum value of component sub-capabilities. The capability average is another way to look at SDG&E's performance in asset maintenance and repair. The capability average is determined from the average of all component sub-capabilities and is an additional tool to evaluate the utilities' maturity.[89]

When the capability maturity is calculated using the average (rather than the minimum), SDG&E has a maturity level for asset maintenance and repair of 1.5 for 2023 and projects no maturity level change for 2024 or 2025 (Figure 8.1-6).

[88] 2023 Maturity Survey Category C "Grid Design, Inspections, and Maintenance," Capability 15 "Asset maintenance and repair."

[89] For further information on maturity level determinations, see Section 4 of the 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (second revision), published February 21, 2023.

Figure 8.1-6. Cross-Utility Maturity for Asset Maintenance and Repair[90] (Average Values)



The rest of this section reports on maturity levels considering the average values.

SDG&E's maturity level in this category is limited by its response to the following questions:

- SDG&E reports that it does not account for performance history of individual equipment when establishing maintenance frequency. [91] To increase its maturity level, SDG&E would need to account for performance history when determining maintenance frequency.
- SDG&E reports that it does not estimate equipment service life reduction based on usage and environmental conditions. [92] To increase its maturity level, SDG&E would need to do so.
- SDG&E does not include risk buy-down estimates when prioritizing its maintenance.[93] SDG&E projects including these estimates by 2025.

SDG&E's current average maturity level in this capability is comparable to its peers, with PG&E and SCE reporting at levels 1.75 and 1.5, respectively. However, unlike SDG&E, both

[90] 2023 Maturity Survey Category C "Grid Design, Inspections, and Maintenance," Capability 15 "Asset maintenance and repair."

[91] SDG&E's 2023 Maturity Survey, response to 3.3.1.Q5.

[92] SDG&E's 2023 Maturity Survey, response to 3.3.3.Q4.

[93] SDG&E's 2023 Maturity Survey, response to 3.3.4.Q5.

PG&E and SCE project increases in maturity levels to 2.25 and 2.5 respectively. See Figure 8.1-6.

8.1.4.2 SDG&E's WMP Strengths

SDG&E projects improvement in equipment maintenance and repair over the WMP cycle in the following areas: risk-based maintenance strategy, the hotline clamp replacement program, and the expulsion fuse replacement program.

SDG&E reports that it is currently deploying a risk-based maintenance and replacement strategy for the following equipment types:[94]

- Poles and towers
- Conductor
- Capacitors
- Lightning Arrestors
- Fuses
- Connectors
- Insulators

SDG&E states that this strategy is automated and condition-based, evaluating the health of the asset along with the consequence if the asset were to fail.

As seen in Table 8.1-1 "SDG&E Grid Design, Operations, and Maintenance – Selected Targets," SDG&E is planning on replacing a total of 500 hotline clamps in 2023 and 2024. SDG&E expects to complete its hotline clamp replacements by the end of 2024, resulting in it having a target of zero replacements in 2025.

Also, SDG&E is planning on replacing 40 remaining expulsion fuses with CAL FIRE-approved fuses in 2023 (Table 8.1-1). SDG&E plans on completing its expulsion fuse replacements by the end of 2023, resulting in it having a target of zero for 2024 and 2025. SDG&E found that expulsion fuse replacements lowered the ignition rate for fuse operations from 0.12 percent to 0 percent, as seen in Table 8.1-2 "Fuse Operations 2015-2021."

[94] SDG&E's 2023-2025 WMP, page 212.

Table 8.1-2. Fuse Operations 2015-2021[95]

Fuse Type	Number of Fuse Operations	Number of Ignitions	Ignition Rate
CAL FIRE-Approved Fuse	760	0	0%
Expulsion Fuse	2,477	3	0.12%

2022 Areas for Continued Improvement

Energy Safety evaluated the progress SDG&E made toward addressing areas for continued improvement identified in Energy Safety's 2022 WMP Decision. See Appendix B for the status of each 2022 area for continued improvement. Notable progress was made in the following selected areas:

- In response to SDGE-22-18, Evaluation and Interpretation of "Other" Equipment Failures, SDG&E provided additional drivers within Table 5 of its Quarterly Data Report (QDR). This led to a decrease in wire down events being reported as "Other" from 39.6 percent in 2022 to 0.5 percent in 2023, as well as a decrease in distribution unplanned outages from 2.1 percent in 2022 to 0.1 percent in 2023.[96]
- In response to SDGE-22-19, Plan to Address Missing Asset Data, SDG&E states that it is using machine learning to find and address data gaps and has decreased missing installation dates to only 0.14 percent for poles and 0 percent for wires.[97]

8.1.4.3 Areas for Continued Improvement

Equipment Maintenance and Repair Maturity Level

Given SDG&E's lower maturity compared to PG&E and SCE, and lack of projection to improve, SDG&E must put a plan in place to increase its maturity over the current WMP cycle. In its 2025 Update, SDG&E must provide a plan to increase its maturity level for equipment maintenance and repair. In this plan, SDG&E must discuss how it intends to account for the performance history of equipment when establishing maintenance frequency, estimate equipment service life reduction based on usage and environmental conditions, and include risk buy-down estimates as part of its asset maintenance prioritization.

[95] SDG&E's 2023-2025 WMP, SDG&E Table 8-25 "CAL FIRE and Expulsion Fuse Operation 2015-2021," page 216.

[96] SDG&E's 2023-2025 WMP, Appendix D, page 24.

[97] SDG&E's 2023-2025 WMP, Appendix D, page 25.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 11.

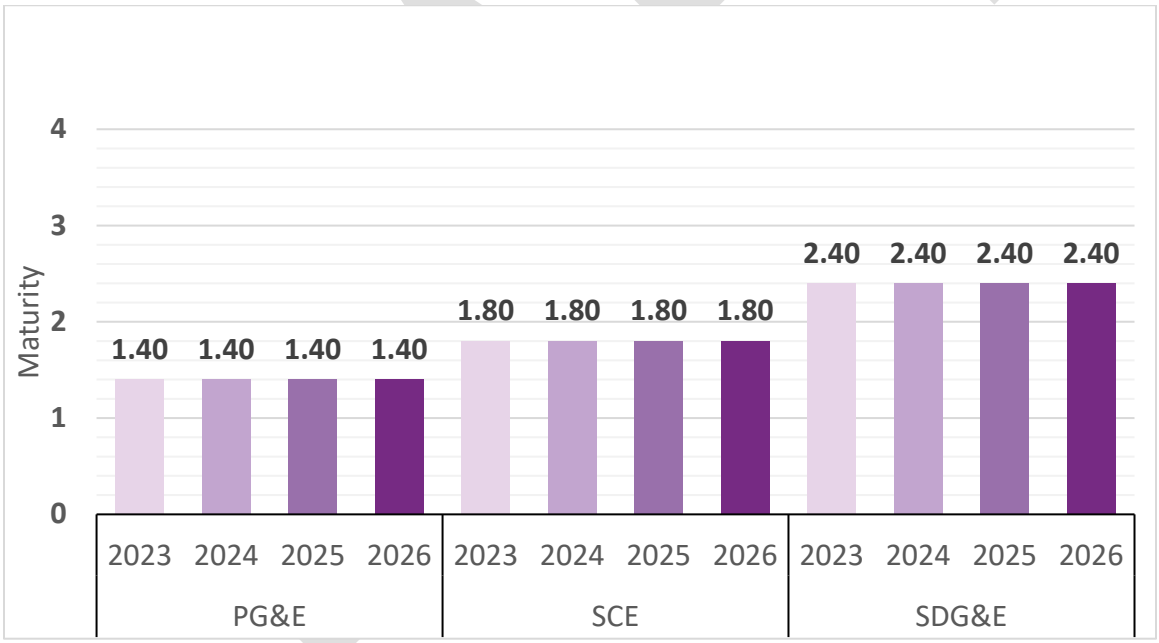
8.1.5 Grid Operations and Procedures

Section 8.1.8 of the Technical Guidelines requires SDG&E to describe how it manages and operates its grid to reduce wildfire risk, including in relation to equipment settings, grid response procedures and notifications, and personnel work procedures and training.[98]

8.1.5.1 Maturity Survey Results

According to its responses to the 2023 Maturity Survey, SDG&E has a 2023 maturity level of 2.4 for grid operations and protocols. SDG&E projects no maturity level change for 2024 or 2025 (Figures 8.1-7 and 8.1-8).

Figure 8.1-7. Cross-Utility Maturity for Grid Operations and Protocols[99] (Minimum Values)



The utility's maturity level for the grid operations and protocols maturity category described above is calculated using the minimum value sub-capability of each capability. Using the capability average is another way to look at SDG&E's performance in grid operations and

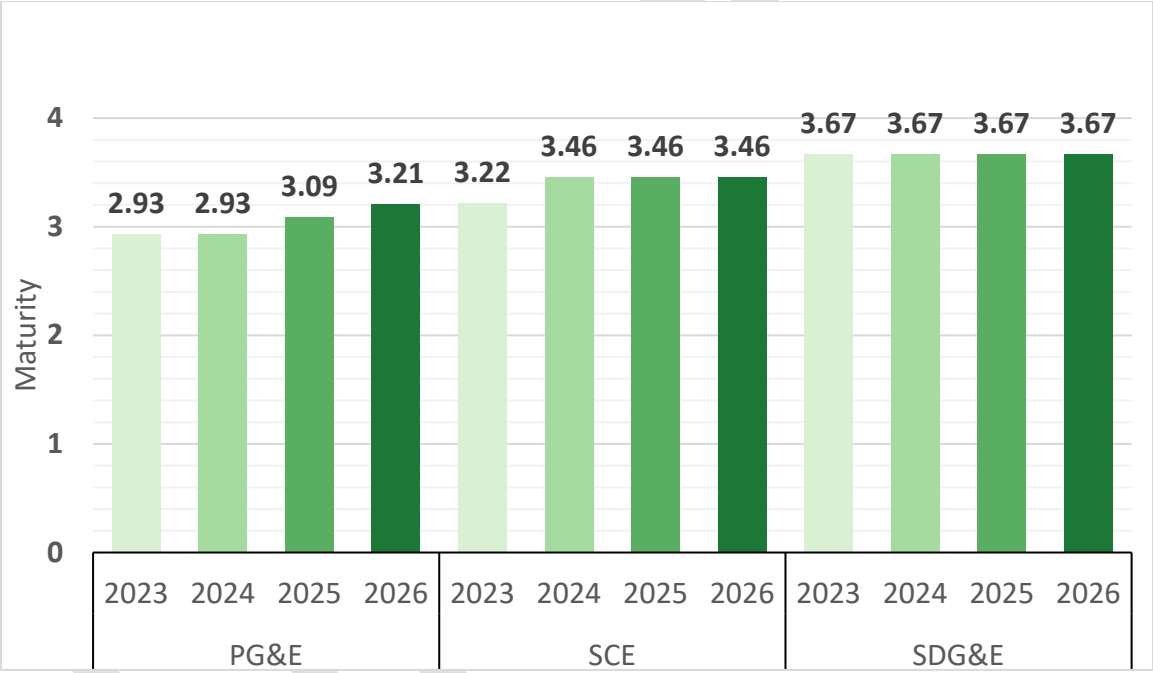
[98] Technical Guidelines, Section 8.1.8, pages 88-89 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[99] 2023 Maturity Survey Category E "Grid Operations and Protocols."

protocols. The capability average is determined from the average of all component sub-capabilities and is an additional tool to evaluate the utilities' maturity. [100]

When the category maturity is calculated using the capability average (rather than the minimum), SDG&E has a maturity level for grid operations and protocols of 3.67 for 2023 and projects no maturity level change for 2024 or 2025 (Figure 8.1-8).

Figure 8.1-8. Cross-Utility Maturity for Grid Operations and Protocols[101] (Average Values)



The rest of this section reports on maturity levels considering the average values.

SDG&E's maturity level in this category is limited by its response to the following question:

- SDG&E reports that it does not use predictive modeling to understand the lifespan of equipment based on documented grid operating history.[102] To increase its maturity, it would need to use predictive modeling.

SDG&E's current maturity level in this category is higher than its peers, with PG&E and SCE reporting at levels 1.4 and 1.8, respectively. See Figure 8.1-7.

[100] For further information on maturity level determinations, see Section 4 of the 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (second revision), published February 21, 2023.

[101] 2023 Maturity Survey Category E "Grid Operations and Protocols."

[102] SDG&E's 2023 Maturity Survey, response to 5.2.1.Q1.

Based on its responses to the 2023 Maturity Survey, SDG&E reported its highest levels of projected maturity in the following capabilities for 2023 and 2024:

- Protective equipment and device settings[103]
- Ignition prevention and suppression[104]

Based on its responses to the 2023 Maturity Survey, SDG&E reported its lowest levels of projected maturity in the following capabilities for 2023 and 2024:

- Incorporation of ignition risk factors in grid control[105]

8.1.5.2 SDG&E's WMP Strengths

SDG&E projects improvement in grid operations and procedures over the WMP cycle in the following areas: grid response procedures and notifications.

SDG&E reports that it is using SCADA and Wireless Fault Indication to more quickly identify the location of any detected issues along its system.[106] SDG&E is also evaluating the use of predictive fault analytics technology to identify any propagating issues.[107] SDG&E states that it prioritizes its response to faults first by potential ignitions or other safety issues, then critical public infrastructure, then customer impacts.[108]

2022 Areas for Continued Improvement

Energy Safety evaluated the progress SDG&E made toward addressing areas for continued improvement identified in Energy Safety's 2022 WMP Decision. See Appendix B for the status of each 2022 area for continued improvement. Notable progress was made in the following selected areas:

- In response to SDGE-22-16, Enabling Circuits with Advanced Protection, SDG&E states that it faced delays due to permitting and supply chain issues. As a result, SDG&E included delayed projects in its 2023 targets and has a backlog of projects that can move forward if projects still face delays.[109]

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[103] SDG&E's responses to questions on the 2023 Maturity Survey under Category E "Grid Operations and Protocols," Capability 22 "Protective equipment and device settings."

[104] SDG&E's responses to questions on the 2023 Maturity Survey under Category E "Grid Operations and Protocols," Capability 26 "Ignition prevention and suppression."

[105] SDG&E's responses to questions on the 2023 Maturity Survey under Category E "Grid Operations and Protocols," Capability 23 "Ignition prevention and suppression."

[106] SDG&E's 2023-2025 WMP, page 235.

[107] SDG&E's 2023-2025 WMP, page 235.

[108] SDG&E's 2023-2025 WMP, page 235.

[109] SDG&E's 2023-2025 WMP, Appendix D, page 22.

- In response to SDGE-22-24, Replacing Protective Devices for Sensitivity Setting Capabilities, SDG&E states that its analysis concluded that its system has enough coverage with existing devices. This consists of 450 devices, with 157 circuits within the HFTD.[110]

8.1.5.3 Areas for Continued Improvement

SDG&E must continue to improve in the following areas.

Evaluation of Sensitive Relay Profile in Highest Risk Areas

While SDG&E has deemed its current use of sensitive relay profile (SRP) to be sufficient, SDG&E has not provided adequate analysis showing that the current areas covered by SRP align with the highest risk areas based on SDG&E's risk models. SDG&E instead only states that there is SRP coverage within the HFTD, which does not adequately demonstrate proper coverage in the highest risk areas.[111]

In its 2025 Update, SDG&E must provide an analysis showing the current coverage of SRP in SDG&E's highest risk areas based on SDG&E's risk models and—based on this analysis—provide updated targets for installing new devices for SRP coverage. This analysis must include ensuring SRP coverage of the highest risk areas not already covered by SRP, or alternatively an analysis showing why this coverage is not needed.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 11.

8.2 Vegetation Management and Inspections

In response to Section 8.2 of the Technical Guidelines, SDG&E provided information on its vegetation management programs, including vegetation inspections, vegetation and fuels management, vegetation management enterprise systems, environmental compliance and permitting, quality assurance and quality control, open work orders, and workforce planning as applicable.[112]

Below is Energy Safety's evaluation regarding SDG&E's objectives and targets, maturity levels, and strengths in these areas. In addition, Energy Safety has identified areas where SDG&E must improve, described at the end of this section.

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[110] SDG&E's 2023-2025 WMP, Appendix D, page 30.

[111] SDG&E's 2023-2025 WMP, Appendix D, page 30.

[112] Technical Guidelines, Section 8.2, "Vegetation Management and Inspections," pages 94-113 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

8.2.1 Objectives and Targets

As part of its Base WMP, SDG&E provided 3-year and 10-year objectives for its vegetation management programs.[113]

SDG&E also defined quantitative targets for initiative activities for its vegetation management programs. SDG&E's Base WMP includes end-of-year targets for 2023, 2024, and 2025. Selected targets are included in Table 8.2-1 to demonstrate the utility's commitment to mitigating ignition risk from vegetation contact.

Table 8.2-1. SDG&E Vegetation Management – Selected Targets

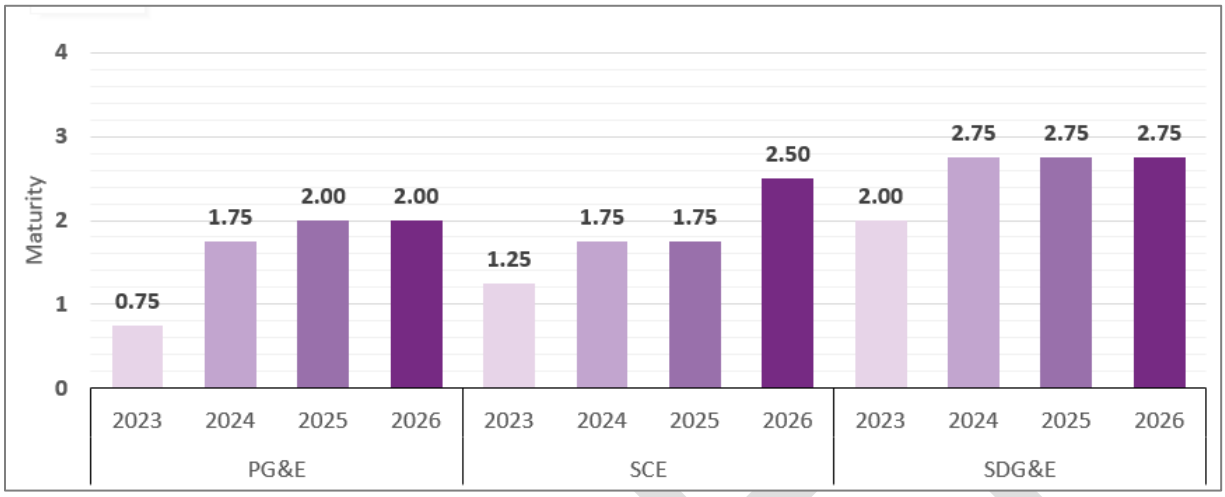
Initiative Activity	Target Unit	2023 Target	2024 Target	2025 Target
Detailed Inspections	Inspections	485,400	485,400	485,400
Off-Cycle Patrol	Vegetation Management Areas	106	106	106
Pole Clearing	Poles	33,010	33,010	33,010

8.2.2 Maturity Survey Results

According to its responses to the 2023 Maturity Survey, SDG&E has a 2023 maturity level of 2 for vegetation management and inspections. For 2024, SDG&E projects that it will increase in maturity to a level of 2.75. SDG&E projects no further maturity level change for 2025 (Figures 8.2-1 and 8.2-2).

[113] SDG&E's 2023 WMP, OEIS Table 8-12 "Vegetation Management Initiative Objectives (3-year plan)," pages 253-254; OEIS Table 8-13 "Vegetation Management Initiative Objectives (10-year plan)," pages 254-256.

Figure 8.2-1. Cross-Utility Maturity for Vegetation Management and Inspections (Minimum Values)

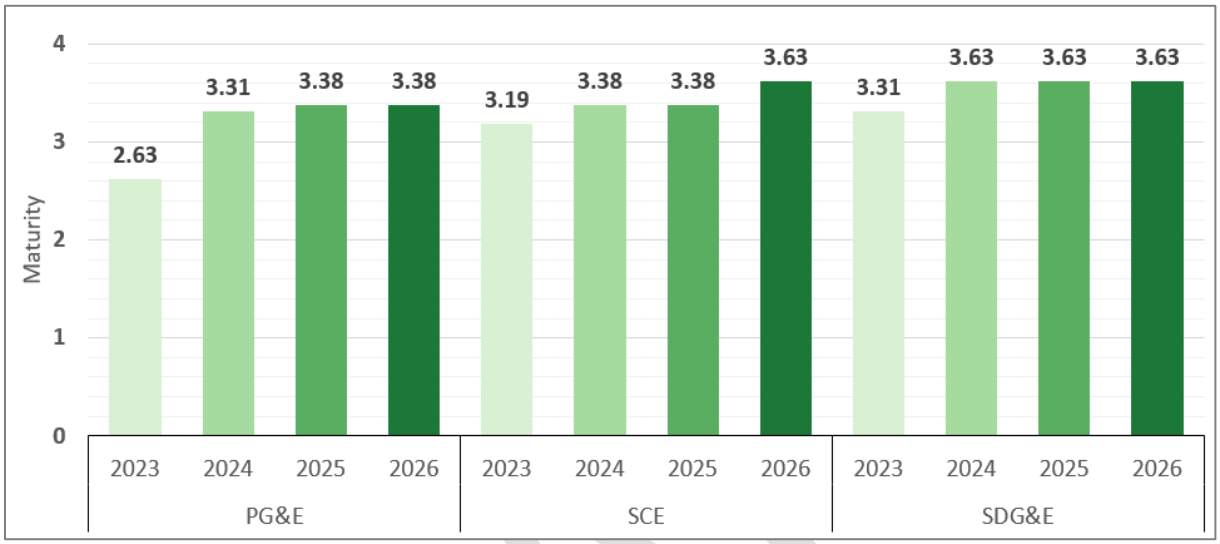


The utility's maturity level for the vegetation management and inspections category described above is calculated using the minimum value sub-capability of each capability. Using the capability average is another way to look at SDG&E's performance in vegetation management and inspections. The capability average is determined from the average of all component sub-capabilities and is an additional tool to evaluate the utilities' maturity. [114]

When the category maturity is calculated using the capability average (rather than the minimum), SDG&E has a maturity level for vegetation management and inspections of 3.31 for 2023 and projects a level of 3.63 in 2024 and 2025 (Figure 8.2-2).

[114] For further information on maturity level determinations, see Section 4 of the 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (second revision), published February 21, 2023.

Figure 8.2-2. Cross-Utility Maturity for Vegetation Management and Inspections (Average Values)



The rest of this section reports on maturity levels considering the minimum values.

Across the three-year WMP cycle, SDG&E shows improvement over the first year and then remains consistent for next two years of the cycle.

SDG&E's current maturity level in this category is higher than its peers, with PG&E and SCE reporting at levels 0.75 and 1.25, respectively. See Figures 8.2-1 and 8.2-2.

Based on its responses to the 2023 Maturity Survey, SDG&E reported its highest levels of projected maturity in the following capabilities for 2023 and 2024: vegetation treatment[115] and vegetation inventory and condition database.[116]

Based on its responses to the 2023 Maturity Survey, SDG&E reported its lowest levels of projected maturity in the following capability for 2023 and 2024: vegetation inspections.[117]

8.2.3 SDG&E's WMP Strengths

SDG&E projects improvement in vegetation management over the WMP cycle in the following areas: vegetation management inspections and vegetation and fuels management.

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[115] SDG&E's responses to questions on the 2023 Maturity Survey under Category D "Vegetation Management and Inspections," Capability 18 "Vegetation inventory and condition database."

[116] SDG&E's responses to questions on the 2023 Maturity Survey under Category D "Vegetation Management and Inspections," Capability 18 "Vegetation inventory and condition database."

[117] SDG&E's responses to questions on the 2023 Maturity Survey under Category D "Vegetation Management and Inspections," Capability 19 "Vegetation inspections."

SDG&E conducts a robust, annual inspection of vegetation adjacent to its assets. SDG&E's vegetation inspections consist of annual, detailed, and digitally documented assessment of each inventory tree within the HFTD.[118] This high level of frequency and granularity ensures outages and ignitions from vegetation contact are minimized. SDG&E has the lowest number of vegetation-caused ignitions and outages per 10,000 overhead circuit miles (10k OCM) among the three large IOUs (see Figure 8.2-3).

Also, SDG&E has hired additional internal staff to support its vegetation management efforts. For example, SDG&E hired four internal forester patrollers to perform off-cycle tree inspections within the HFTD.[119]

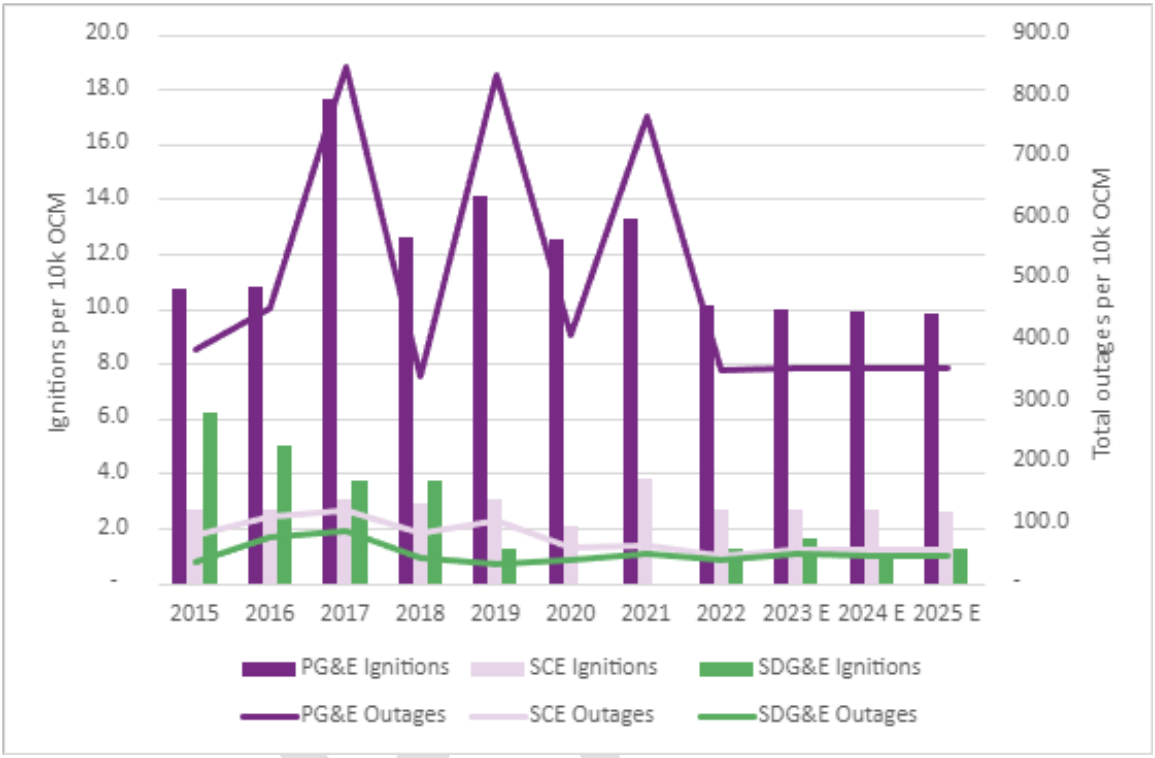
Another strength in SDG&E's vegetation management program is that it maintains a consistent tree density adjacent to its assets. SDG&E has approximately 74 trees per circuit mile within the HFTD and has managed to keep this density metric consistent over the past eight years.[120]

[118] SDG&E's 2023-2025 WMP, pages 260-265.

[119] SDG&E's 2023-2025 WMP, page 264.

[120] SDG&E's 2023-2025 WMP, page 258.

Figure 8.2-3. Cross-Utility Vegetation-Caused Ignitions and Outages Normalized by 10k Overhead Circuit Miles (10k OCM)[121]



8.2.3.1 2022 Areas for Continued Improvement

Energy Safety evaluated the progress SDG&E made toward addressing areas for continued improvement identified in Energy Safety's 2022 WMP Decision. See Appendix B for the status of each 2022 area for continued improvement. Notable progress was made in the following selected area:

- For SDGE-22-2, Progression of Effectiveness of Enhanced Clearances Joint Study, the large IOUs hired a third party to establish the data collection standard, create the cross-utility vegetation risk event database, and study the relationship between enhanced vegetation clearances and tree-caused risk events.[122] The third party plans to align about 25 variables related to vegetation risk events between the large IOUs

[121] This figure was developed by Energy Safety using data from PG&E, SCE, and SDG&E's 2022 Quarterly Data Reports (QDRs). Q3 submissions were used for the 2015-2021 data and Q4 submissions were used for the 2022-2025 data. These reports are available on the 2022-QDR docket log (https://efiling.energysafety.ca.gov/Lists/DocketLog.aspx?docketnumber=2022-QDR, accessed August 28, 2023).

[122] SCE's 2023-2025 WMP, page 767.

and warehouse the data by late summer 2023. The third party will then begin its data analysis phase, which it expects to complete in March 2024.[123]

8.2.4 Areas for Continued Improvement

SDG&E must continue to improve in the following areas.

SDG&E's states that a future change to its off-cycle vegetation inspection activity within the next five years is to "identify additional and proactive HFTD inspection activity opportunities such as pre-PSPS and adverse weather condition and event patrols."[124] To foster collaborative learning and improvement across the industry, SDG&E must report in its next Base WMP on its efforts to identify additional and proactive HFTD inspection activity opportunities.

The large IOUs, including SDG&E, must also continue efforts on the Effectiveness of Enhanced Clearances Joint Study to meet the requirements of SDGE-21-04.[125] In its 2025 Update, SDG&E, along with PG&E and SCE, must report on the progress and outcomes of the third-party contractor's analysis and evaluation of the effectiveness of enhanced clearances. Also, with its next Base WMP, SDG&E, along with PG&E and SCE, must submit a white paper which discusses the IOUs' joint evaluation of the effectiveness of enhanced clearances including, but not limited to, the effectiveness of enhanced clearances in reducing tree-caused outages and ignitions, and the IOUs' joint recommendations for updates and changes to utility vegetation management operations and best management practices for wildfire safety based on this study.

Additionally, as noted above in the area for continued improvement "Cross-Utility Collaboration on Best Practices for Inclusion of Climate Change Forecasts in Consequence Modeling, Inclusion of Community Vulnerability in Consequence Modeling, and Utility Vegetation Management for Wildfire Safety" in Section 7.2, "Risk-Informed Framework," SDG&E must make further improvements in the area of cross-utility collaboration on best practices for utility vegetation management for wildfire safety. In their 2025 Updates, the IOUs (not including independent transmission operators) must provide a status update on any collaboration with each other that has taken place in the area of vegetation management best practices for wildfire safety, including a list of any resulting changes made to their WMPs since the 2023-2025 WMP submission.

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[123] Data Request OEIS-P-WMP_2023-SDGE-004 (Question 6) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54144&shareable=true, accessed June 16, 2023).

[124] SDG&E's 2023-2025 WMP, page 268.

[125] Final Action Statement on the 2021 Wildfire Mitigation Plan (WMP) Update of San Diego Gas & Electric Company, page 53 (https://energysafety.ca.gov/wp-content/uploads/tn10257_20210720t164339_revised_final_action_statement_on_san_diego_gas__electr.pdf, accessed July 18, 2023).

Energy Safety sets forth specific areas for improvement and associated required progress in Section 11.

8.3 Situational Awareness and Forecasting

In response to Section 8.3 of the Technical Guidelines, SDG&E provided information on its situational awareness and forecasting, including environmental monitoring systems, grid monitoring systems, ignition detection systems, weather forecasting, and fire potential index as applicable.[126]

Below is Energy Safety's evaluation regarding SDG&E's objectives and targets, maturity levels, and strengths in these areas. In addition, Energy Safety has identified areas where SDG&E must improve, described at the end of this section.

8.3.1 Objectives and Targets

As part of its Base WMP, SDG&E provided 3-year and 10-year objectives for its situational awareness and forecasting programs.[127]

SDG&E also defined quantitative targets for initiative activities for its situational awareness and forecasting programs. SDG&E's Base WMP includes end-of-year targets for 2023, 2024, and 2025. A selected target is included in Table 8.3-1 to demonstrate the utility's projected progress.

Table 8.3-1. SDG&E Situational Awareness and Forecasting – Selected Target

Initiative Activity	Target Unit	2023 Target	2024 Target	2025 Target
Air Quality Index (AQI)	Sensors	6	6	6

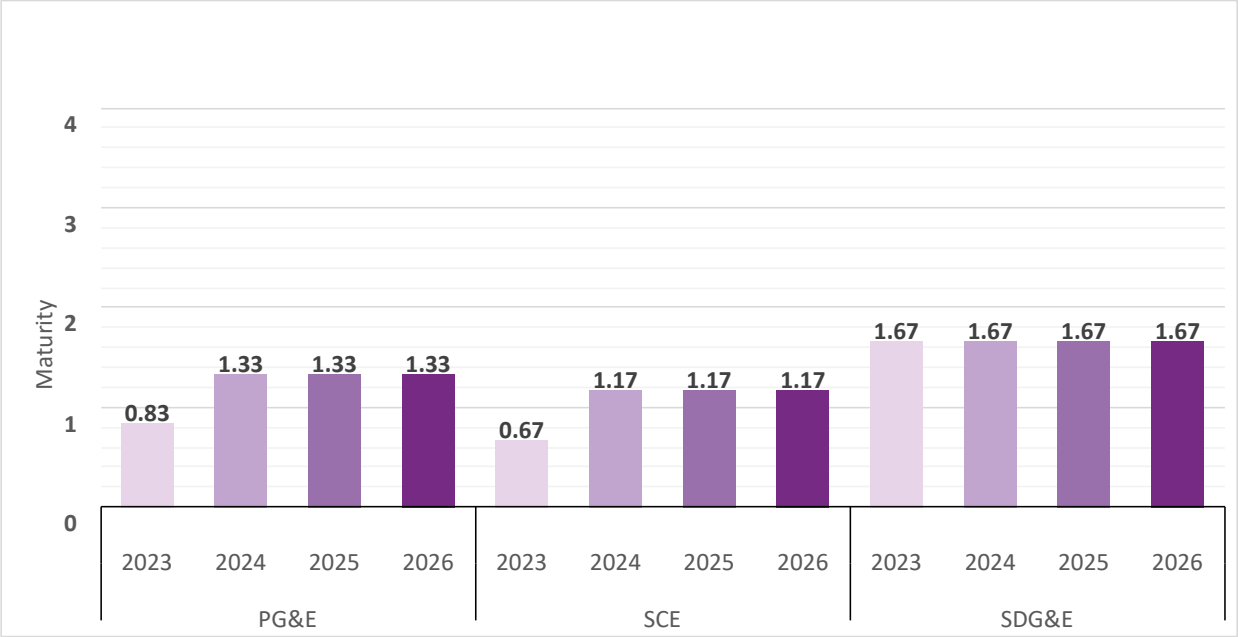
8.3.2 Maturity Survey Results

According to its responses to the 2023 Maturity Survey, SDG&E has a 2023 maturity level of 1.67 for situational awareness and forecasting. SDG&E projects no maturity level change for 2024 or 2025 (Figures 8.3-1 and 8.3-2).

[126] Technical Guidelines, Section 8.3, "Situational Awareness and Forecasting," pages 114-135 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[127] SDG&E's 2023-2025 WMP, pages 290-296.

Figure 8.3-1. Cross-Utility Maturity for Situational Awareness and Forecasting (Minimum Values)

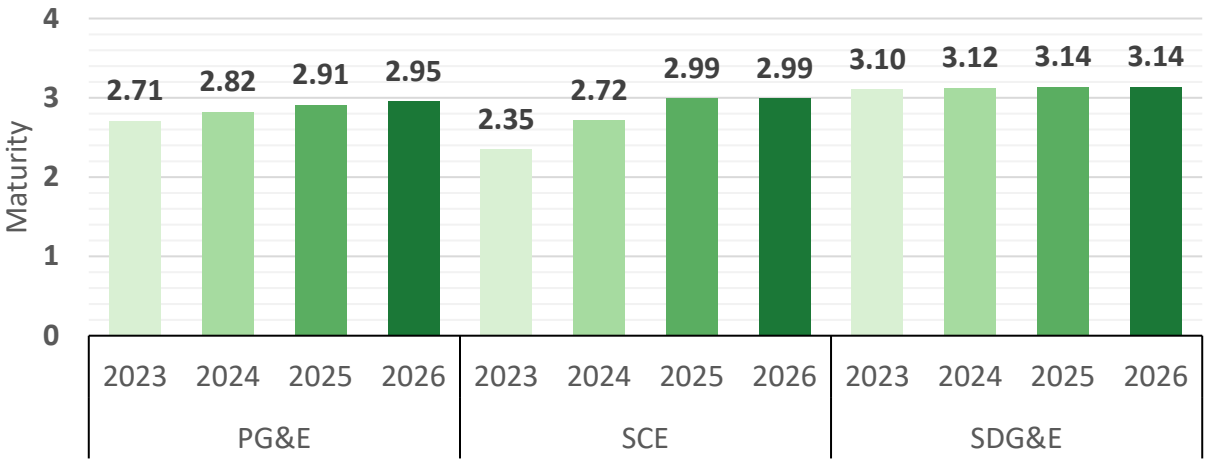


The utility's maturity level for the situational awareness and forecasting category described above is calculated using the minimum value sub-capability of each capability. Using the capability average is another way to look at SDG&E's performance in situational awareness and forecasting. The capability average is determined from the average of all component sub-capabilities and is an additional tool to evaluate the utilities' maturity.[128]

When the category maturity is calculated using the capability average (rather than the minimum), SDG&E has a maturity level for situational awareness and forecasting of 3.1 for 2023, 3.12 in 2024, and 3.14 in 2025 (Figure 8.3-2).

[128] For further information on maturity level determinations, see Section 4 of the 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (second revision), published February 21, 2023.

Figure 8.3-2. Cross-Utility Maturity for Situational Awareness and Forecasting (Average Values)



The rest of this section reports on maturity levels considering the average values.

SDG&E's current maturity level in this category is higher than its peers, with PG&E and SCE reporting at levels 2.71 and 2.35, respectively. See Figure 8.3-2.

Based on its responses to the 2023 Maturity Survey, SDG&E reported its highest levels of projected maturity in the following capabilities for 2023 and 2024:

- Data collection for near-real-time conditions[129]
- Wildfire detection and alarm systems[130]
- Centralized monitoring of real-time conditions[131]

Based on its responses to the 2023 Maturity Survey, SDG&E reported its lowest levels of projected maturity in the following capabilities for 2023 and 2024:

- Ignition likelihood estimation[132]

[129] SDG&E's responses to questions on the 2023 Maturity Survey under Category B "Situational Awareness and Forecasting," Capability 10 "Data collection for near-real-time conditions."

[130] SDG&E's responses to questions on the 2023 Maturity Survey under Category B "Situational Awareness and Forecasting," Capability 11 "Wildfire detection and alarm systems."

[131] SDG&E's responses to questions on the 2023 Maturity Survey under Category B "Situational Awareness and Forecasting," Capability 12 "Centralized monitoring of real-time conditions."

[132] SDG&E's responses to questions on the 2023 Maturity Survey under Category B "Situational Awareness and Forecasting," Capability 7 "Ignition likelihood estimation."

- Wildfire spread forecasting[133]

8.3.3 SDG&E's WMP Strengths

SDG&E projects improvement in situational awareness and forecasting over the WMP cycle in the following area: environmental monitoring systems.

SDG&E intends to implement additional dead fuel moisture (DFM) sensors on existing weather stations where fuel moisture data are limited,[134] as well as updating chamise live fuel moisture (LFM) models,[135] and normalized difference vegetation index (NDVI) models using machine learning in new site locations and improved resolution through remote sensing data.[136] SDG&E is also considering employing soil moisture sensors to compliment the current LFM sampling efforts.[137]

Furthermore, SDG&E plans to upgrade its Weather Research and Forecasting (WRF) model by expanding its weather model ensemble to include 10 members and improving its forecasting resolution from 2 km to 1.5 km.[138]

Additionally, SDG&E intends to evaluate a new 200-member ensemble forecast in collaboration with the University of California at San Diego, aligning with peer utilities, to assess its effectiveness and reliability.[139]

8.3.3.1 2022 Areas for Continued Improvement

Energy Safety evaluated the progress SDG&E made toward addressing areas for continued improvement identified in Energy Safety's 2022 WMP Decision. SDG&E made sufficient progress in its 2022 area for continued improvement in situational awareness and forecasting. See Appendix B for the status of each 2022 area for continued improvement.

8.3.4 Areas for Continued Improvement

SDG&E must continue to improve in the following areas.

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[133] SDG&E's responses to questions on the 2023 Maturity Survey under Category B "Situational Awareness and Forecasting," Capability 9 "Wildfire spread forecasting."

[134] Data Request OEIS-P-WMP_2023-SDGE-002, Question 3 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54137&shareable=true, accessed July 18, 2023).

[135] SDG&E's 2023-2025 WMP, page 320.

[136] SDG&E's 2023-2025 WMP, page 331.

[137] SDG&E's 2023-2025 WMP, page 331.

[138] SDG&E's 2023-2025 WMP, page 320.

[139] SDG&E's 2023-2025 WMP, page 299.

SDG&E has included many updates to its initiatives related to situational awareness and forecasting. However, while these updates include measurable targets in the planned improvements and objectives section, they are not included in the OEIS Table 8-23 "Situational Awareness Initiative Targets by Year."[140] In its 2025 Update, SDG&E must provide a more comprehensive list of measurable targets in its table "Situational Awareness Initiative Targets by Year," including targets in its planned improvements section of initiatives.

Also, SDG&E must provide more information about its weather station maintenance and calibration. SDG&E has a network of 222 weather stations and indicates that its focus is on replacing or upgrading existing weather stations[141] with additional sensors such as air quality and fuel sampling (including NDVI cameras and 10-hour dead fuel moisture sensors).[142] SDG&E states that its network is on a rotating calibration schedule to ensure the highest possible accuracy and year over year.[143] These weather stations play an important role in increasing situational awareness, while serving as a fundamental component for SDG&E's fire potential index (FPI), Santa Ana Wildfire threat Index (SAWTI), and its machine learning (ML) wind gust forecasting model. SDG&E must provide an update on the maintenance and calibration of these weather stations in its 2025 Update.

Energy Safety sets forth specific areas for improvement and associated required progress in Section 11.

8.4 Emergency Preparedness

In response to Section 8.4 of the Technical Guidelines, SDG&E provided information on its emergency preparedness, including its wildfire and PSPS emergency preparedness plan; collaboration and coordinating with public safety partners; public notification and communications strategy; preparedness and planning for service restoration; customer support in wildfire and PSPS emergencies; and learning after wildfire and PSPS events as applicable.[144]

Below is Energy Safety's evaluation regarding SDG&E's objectives and targets, maturity levels, and strengths in these areas.

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[140] SDG&E's 2023-2025 WMP, OEIS Table 8-23 "Situational Awareness Initiative Targets by Year," page 296.

[141] SDG&E's 2023-2025 WMP, page 297.

[142] SDG&E's 2023-2025 WMP, page 299.

[143] SDG&E's 2023-2025 WMP, page 302.

[144] Technical Guidelines, Section 8.4, "Emergency Preparedness," pages 135-179 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

8.4.1 Objectives and Targets

Below is Energy Safety's evaluation regarding SDG&E's objectives and targets, maturity levels, and strengths in these areas. As part of its Base WMP, SDG&E provided 3-year and 10-year objectives for its emergency preparedness programs.[145]

SDG&E also defined quantitative targets for initiative activities for its emergency preparedness programs. SDG&E's Base WMP includes end-of-year targets for 2023, 2024, and 2025.

Selected targets are included in Table 8.4-1 to demonstrate the utility's projected progress.

Table 8.4-1. SDG&E Emergency Preparedness – Selected Targets[146]

Initiative Activity	Target Unit	2023 Target	2024 Target	2025 Target
Train wildfire and PSPS response teams	Participate in emergency preparedness PSPS and wildfire exercise training and recertify annually	By 9/1/23	By 9/1/24	By 9/1/25
Update the Company Emergency and Disaster Preparedness Plan (CEADPP)	Update procedures, conditions, law, or policy annually	By 12/30/23	By 12/30/24	By 12/30/25

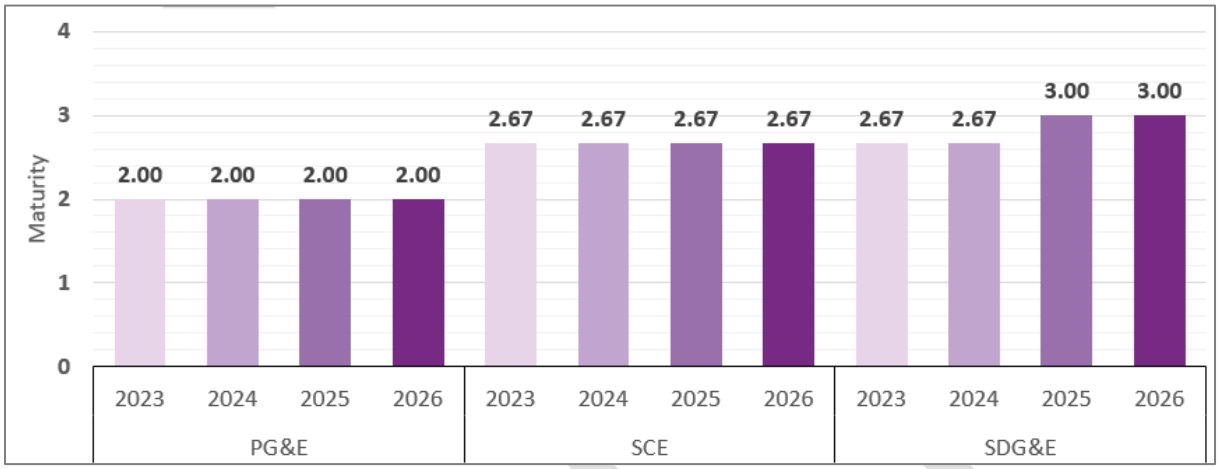
8.4.2 Maturity Survey Results

According to its responses to the 2023 Maturity Survey, SDG&E has a 2023 maturity level of 2.67 for emergency preparedness. For 2024, SDG&E projects the same maturity level. For 2025, SDG&E projects that it will slightly increase in maturity to a level of 3 (Figure 8.4-1).

[145] SDG&E's 2023-2025 WMP, pages 333-336.

[146] SDG&E's 2023-2025 WMP, OEIS Table 8-35 "Emergency Preparedness Initiative Targets by Year," pages 336-337.

Figure 8.4-1. Cross-Utility Maturity for Emergency Preparedness (Minimum Values)

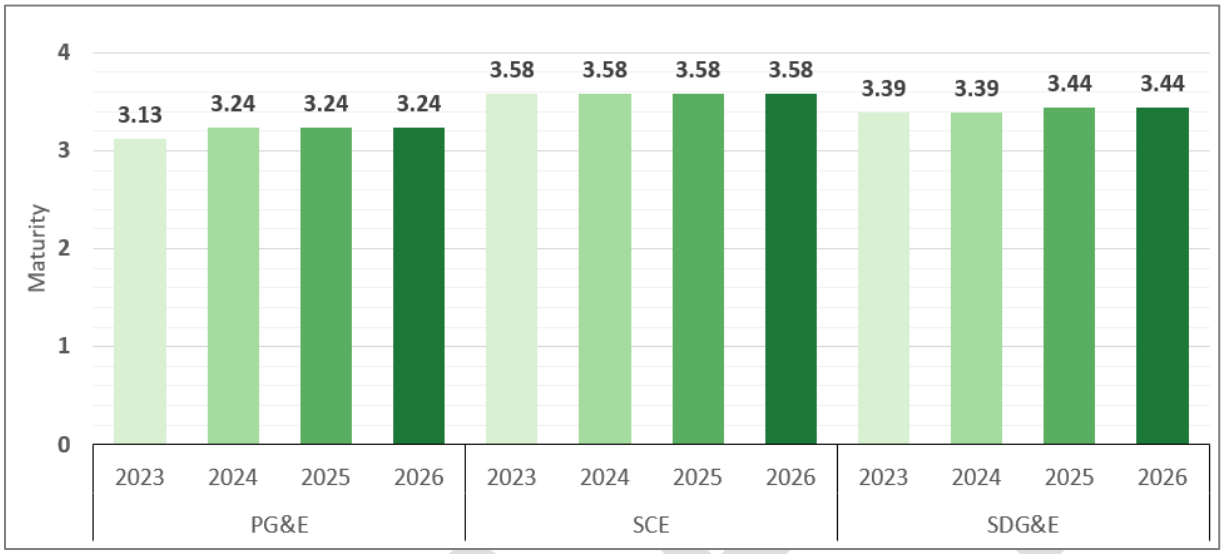


The utility's maturity level for the emergency preparedness category described above is calculated using the minimum value sub-capability of each capability. Using the capability average is another way to look at SDG&E's performance in emergency preparedness. The capability average is determined from the average of all component sub-capabilities and is an additional tool to evaluate the utilities' maturity. [147]

When the category maturity is calculated using the capability average (rather than the minimum), SDG&E has a maturity level for emergency preparedness of 3.39 for 2023 and projects no change in 2024. It projects a slightly higher maturity level of 3.44 in 2025 (Figure 8.4-2).

[147] For further information on maturity level determinations, see Section 4 of the 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (second revision), published February 21, 2023.

Figure 8.4-2. Cross-Utility Maturity for Emergency Preparedness (Average Values)



The rest of this section reports on maturity levels considering the minimum values.

SDG&E's maturity level in this category is limited by its response to the following questions:

- SDG&E indicated that it could not provide support services in the community within one hour of wildfire detection.[148] To mature in this area SDG&E would have to respond affirmatively that it does provide support services within one hour.
    - In an explanatory comment on this question, SDG&E added that it "will consider means to direct customers and the public to applicable public safety partners, who are better equipped and suited to provide emergency action instructions, including shelter in place or evacuation orders. If the utility assumed this responsibility as well, it would likely create inaccuracies and confusion."
- SDG&E indicated that it performs annual maintenance, testing, and inspection of the physical systems that provide detection, alarm, notification, central monitoring, and transmission of "approved" reporting information.[149] To mature in this area SDG&E would have to indicate that it performs these actions more frequently (twice annually, monthly, or weekly).

SDG&E's current maturity level in this category is the same as SCE's, 2.67, and higher than PG&E's, which is 2.00. See Figure 8.4-1.

[148] SDG&E's 2023 Maturity Survey, response to 6.3.4.Q6.

[149] SDG&E's 2023 Maturity Survey, response to 6.3.5.Q1.

Based on its responses to the 2023 Maturity Survey, SDG&E reported its highest levels of projected maturity in the following capabilities for 2023 and 2024:

- Wildfire and PSPS emergency and disaster preparedness plan[150]
- Collaboration and coordination with public safety partners[151]
- Customer support in wildfire and PSPS emergencies[152]

Based on its responses to the 2023 Maturity Survey, SDG&E reported its lowest levels of projected maturity in the following capabilities for 2023 and 2024:

- Public emergency communication strategy[153]
- Preparedness and planning for service restoration[154]
- Learning after wildfire and PSPS incidents[155]

8.4.3 SDG&E's WMP Strengths

SDG&E projects improvement in emergency preparedness over the WMP cycle in the following areas: emergency preparedness plan, public emergency communication strategy, and external collaboration and coordination. Further information is provided below.

SDG&E is in the process of becoming accredited by the Emergency Management Accreditation Program (EMAP). EMAP has a set of 73 standards it uses to evaluate programs that apply for accreditation. According to EMAP, no "energy utility" has yet been accredited by EMAP.[156]

SDG&E designed its Emergency Operations Center (EOC) with enhancements to strengthen the readability of current and future PSPS tools (e.g., its dashboard). These changes make the tools easier for EOC staff to use during emergencies.

SDG&E is developing a Wildfire and Climate Resiliency Center, which is set to open in the first quarter of 2024. Also, SDG&E provides event-specific information about impacted areas through its "NewsCenter," which is staffed around the clock during events.[157]

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[150] SDG&E's 2023 Maturity Survey, responses under 6.1.1 – 6.1.4.

[151] SDG&E's 2023 Maturity Survey, responses under 6.2.1 – 6.2.2.

[152] SDG&E's 2023 Maturity Survey, responses under 6.5.1.

[153] SDG&E's 2023 Maturity Survey, responses under 6.3.4.

[154] SDG&E's 2023 Maturity Survey, responses under 6.4.1.

[155] SDG&E's 2023 Maturity Survey, responses under 6.6.1 – 6.6.2.

[156] Per phone conversation with EMAP Assistant Director Christine Walsh on June 21, 2023.

[157] SDG&E's 2023-2025 WMP, page 372.

SDG&E indicates that it has a strong relationship with tribes and facilitates communicating, collaborating, and coordinating with tribes during wildfire and PSPS events. For example, SDG&E partnered with the La Jolla Band of Luiseno Indians to host a Wildfire Resiliency Fair to promote PSPS awareness and preparedness in tribal communities. Also, several tribes are working with SDG&E to potentially install Tribal Resource Centers (TRC), which are run by the tribal government and provide resources during PSPS events. Further, SDG&E added a Tribal Relations Manager position to its Tribal Relations Team. This position supports tribes on topics related to wildfire resiliency and PSPS year-round.

8.4.3.1 2022 Areas for Continued Improvement

There were no areas for continued improvement for SDG&E in its emergency preparedness resulting from Energy Safety's evaluation of SDG&E's 2022 WMP Update.

8.4.4 Areas for Continued Improvement

Energy Safety has no areas for continued improvement for SDG&E under the emergency preparedness section of its Base WMP.

8.5 Community Outreach and Engagement

In response to Section 8.5 of the Technical Guidelines, SDG&E provided information on its community outreach and engagement, including its public outreach and educational awareness for wildfires, PSPS, outages, and vegetation management; public engagement in the WMP decision-making process; engagement with populations with access and functional needs (AFN), local governments, and tribal communities; collaboration on local wildfire mitigation and planning; and best practice planning as applicable.[158]

Below is Energy Safety's evaluation regarding SDG&E's objectives and targets, maturity levels, and strengths in these areas.

8.5.1 Objectives and Targets

As part of its Base WMP, SDG&E provided 3-year and 10-year objectives for its community outreach and engagement programs.[159]

SDG&E also defined quantitative targets for initiative activities for its community outreach and engagement programs. SDG&E's Base WMP includes end-of-year targets for 2023, 2024, and 2025. A selected target is included in Table 8.5-1 to demonstrate the utility's projected progress.

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[158] Technical Guidelines, Section 8.5, "Community Outreach and Engagement," pages 179-194 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[159] SDG&E's 2023-2025 WMP, pages 385-387.

Table 8.5-1. SDG&E Community Outreach and Engagement – Selected Target

Initiative Activity	Target Unit	2023 Target	2024 Target	2025 Target
Customer Feedback Outreach Surveys	Surveys conducted	≥ 2	≥ 2	≥ 2

8.5.2 Maturity Survey Results

According to its responses to the 2023 Maturity Survey, SDG&E has a 2023 maturity level of 4 for community outreach and engagement. SDG&E projects no maturity level change for 2024 or 2025 (Figures 8.5-1 and 8.5-2)

Figure 8.5-1. Cross-Utility Maturity for Community Outreach and Engagement (Minimum Values)

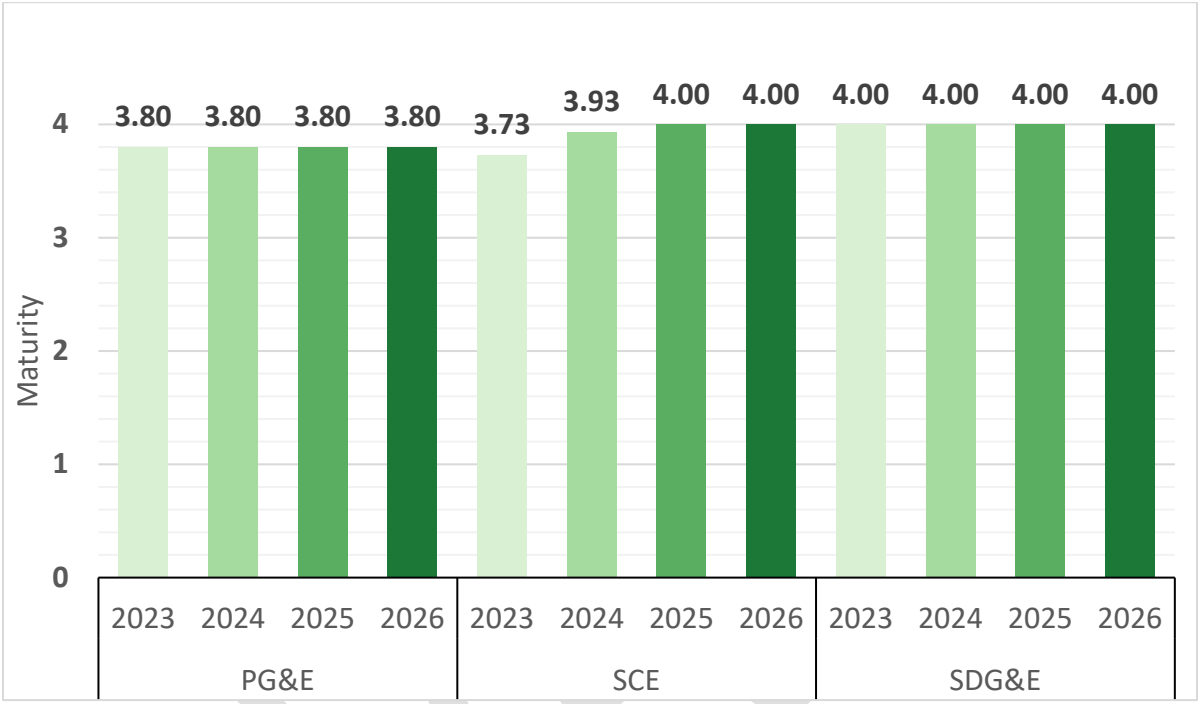
The utility's maturity level for the community outreach and engagement category described above is calculated using the minimum value sub-capability of each capability. Using the capability average is another way to look at SDG&E's performance in community outreach and engagement. The capability average is determined from the average of all component sub-capabilities and is an additional tool to evaluate the utilities' maturity. [160]

When the category maturity is calculated using the capability average, SDG&E has the same maturity level for community outreach and engagement as it does when calculated using the

[160] For further information on maturity level determinations, see Section 4 of the 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (second revision), published February 21, 2023.

sub-capability minimum (4) for 2023 and projects no maturity level change for 2024 or 2025 (Figure 8.5-2).

Figure 8.5-2. Cross-Utility Maturity for Community Outreach and Engagement (Average Values)



The rest of this section reports on maturity levels considering the minimum values.

SDG&E's current maturity level in this category is around the same as its peers, with PG&E and SCE both reporting at a level 3.6. See Figure 8.5-1.

8.5.3 SDG&E's WMP Strengths

SDG&E projects improvement in community outreach and engagement over the WMP cycle in the following areas: public outreach and education awareness program; engagement with access and functional needs (AFN) populations; and collaboration on local wildfire mitigation planning.

SDG&E is in the process of building out a Wildfire and Climate Resilience Center (WCRC), planned for completion by the end of 2023. SDG&E states the WCRC serves a variety of purposes, including housing the primary EOC, a hub for communication during events.

It also functions as a venue to train employees on "the importance of wildfire safety, emergency preparedness, fire science and climate resilience," as well as a resource for

training public safety partners and conducting outreach.[161] The centralization of these activities in one venue will likely have benefits for both community outreach and engagement.

Another of SDG&E's strengths is its engagement with AFN populations. SDG&E's 2023 Plan to Support Populations with Access and Functional Needs During Public Safety Power Shutoffs (AFN Plan)[162] is well-organized and robust, describing the training required for staff engaging with the community and all the ways it addresses AFN customer needs. The AFN Plan is organized into the following sections: "Preparedness/ Readiness (Before Power Shutoff)," "PSPS Activation (During – Emergency Operation Center Activated)," and "Recovery (After – Power has been restored)." In collaboration with its peer utilities PG&E and SCE, SDG&E adopted a "Whole Community" approach.[163] SDG&E incorporated this and other strategies to build its own AFN Plan specific to the needs of its service area.

Additionally, in its 2022 WMP Update, SDG&E reported that it created a dedicated AFN Liaison role in its EOC, and, in its 2023-2025 WMP, SDG&E reports that it expanded its AFN Liaison Officer roster to 14 responders in 2022. It trained each responder to staff the AFN Liaison role in the Emergency Operations Center.[164]

Another strength is SDG&E's level of engagement with local organizations in wildfire mitigation planning. In addition to its collaboration with local fire and suppression agencies, as well as county local government agencies, SDG&E dedicates a Tribal Liaison Manager to support ongoing relationships and communication with the tribal groups within its service territory. The Tribal Liaison works with tribal governments to provide notification of operation and maintenance activities on tribal lands.[165]

While SDG&E does indicate that less than 5 percent of local government and civil society stakeholder groups seek collaboration activities,[166] SDG&E plans to improve in this area by creating web content to notify these groups as well as the public of its resources available to support local wildfire mitigation planning efforts. SDG&E also states that it intends to assign a

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[161] SDG&E's 2023-2025 WMP, pages 364, 370 and 394.

[162] SDG&E's 2023-2025 WMP, Appendix G, San Diego Gas & Electric Company's 2023 Plan to Support Populations with Access and Functional Needs During Public Safety Power Shutoffs (January 31, 2023) (AFN Plan).

[163] SDG&E's WMP, Appendix G, AFN Plan, page 3 ("Engage the whole community in planning," per the Federal Emergency Management Administration's Developing and Maintaining Emergency Operations Plans Comprehensive Preparedness Guide (CPG) 101, 6-Step Process, page 4-1 [https://www.fema.gov/sites/default/files/2020-05/CPG_101_V2_30NOV2010_FINAL_508.pdf, accessed July 20, 2023]).

[164] SDG&E's 2023-2025 WMP, Appendix G, AFN Plan, page 13.

[165] SDG&E's 2023-2025 WMP, p. 400.

[166] SDG&E's 2023-2025 WMP, OEIS Table 8-62, "Key Gaps and Limitations in Collaborating on Local Wildfire Mitigation Planning," pages 401-402.

local wildfire planning liaison to be available as needed for these efforts. SDG&E lists target timeline dates in early 2023 for developing and posting the web content and hiring two local wildfire planning liaisons.

8.5.3.1 2022 Areas for Continued Improvement

There were no areas for continued improvement for SDG&E in its community outreach and engagement resulting from Energy Safety's evaluation of SDG&E's 2022 WMP Update.

8.5.4 Areas for Continued Improvement

Energy Safety has no areas for continued improvement for SDG&E under the community outreach and engagement section of its Base WMP.

9. Public Safety Power Shutoffs

In response to Section 9 of the Technical Guidelines,[167] SDG&E provided its key statistics regarding PSPS; circuits that have been frequently de-energized and measures for how to reduce PSPS implementation on those circuits; how its PSPS program will evolve over the next three and ten years; lessons learned for past PSPS events; and its protocols for PSPS implementation.

Below is Energy Safety's evaluation regarding SDG&E's objectives and targets, maturity levels, and strengths in these areas.

9.1 Objectives and Targets

As part of its Base WMP, SDG&E provided 3-year and 10-year objectives for its PSPS programs.[168]

SDG&E also defined quantitative targets for initiative activities for its PSPS programs. SDG&E's Base WMP includes end-of-year targets for 2023, 2024, and 2025. Selected targets are included in Table 9.1-1 to demonstrate the utility's projected progress.

Table 9.1-1. SDG&E Public Safety Power Shutoffs – Selected Targets

Initiative Activity	Target Unit	2023 Target	2024 Target	2025 Target
Number of Customers Impacted	Customers impacted by PSPS	47,857	44,986	42,287
Number of Circuits De-energized	Circuits de-energized	59.03	55.49	52.16

Many targets provided by SDG&E as PSPS targets[169] are for wildfire mitigation activities (e.g., miles of undergrounding, number microgrids installed). These targets do not track progress in SDG&E's reduction of PSPS scope, scale, or frequency. They are discussed in Section 8 "Wildfire Mitigation Initiatives."

[167] Technical Guidelines, Section 9, pages 195-206 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[168] SDG&E's 2023-2025 WMP, pages 409-410.

[169] SDG&E's 2023-2025 WMP, OEIS Table 9-5 "PSPS Targets," page 411.

9.2 Maturity Survey Results

The Maturity Survey does not measure the maturity of a utility's PSPS operations separately from other mitigation efforts. While it does measure the maturity of PSPS likelihood, exposure potential, and vulnerability, these risk component maturity levels are primarily evaluated in Section 6, Risk Methodology and Assessment, and Section 7, Wildfire Mitigation Strategy Development. Individual maturity capabilities or survey questions related to PSPS are evaluated in the relevant subsection of Section 6.

9.3 SDG&E's WMP Strengths

SDG&E projects improvement in PSPS-related initiatives and activities over the WMP cycle.

SDG&E has committed to exploring grid configurations intended to reduce PSPS risk. SDG&E states there are currently 71 supervisory control and data acquisition (SCADA) sectionalizing devices installed across its 15 circuits that have experienced three or more PSPS events in a calendar year since 2018.[170] Additionally, SDG&E plans to add 10 sectionalizing switches each year over the next three years.[171] Also, SDG&E's WMP projects the addition of four completed microgrids by 2024.[172] SDG&E estimates that 356 customers will experience reduced impacts of PSPS events due to the microgrid completion in a high-risk location.

SDG&E continues to incorporate improvements and engagement strategies with AFN populations. Energy Safety appreciates SDG&E's recognition of and plans to reduce the impacts of PSPS events on vulnerable communities. SDG&E partnered with Facilitating Access to Coordinated Transportation (FACT) to develop a communication protocol for paratransit agencies in its service territory during PSPS events. FACT receives EOC PSPS daily notifications and disseminates the information to approximately 160 paratransit service providers. SDG&E also plans to identify and partner with agencies that are not in the FACT broker network to expand outreach and communication prior to, during, and after a PSPS event.[173] Further, SDG&E trains the responders who staff the AFN Liaison Officer role at its EOC on PSPS-specific concerns.[174]

9.3.1 2022 Areas for Continued Improvement

Energy Safety evaluated the progress SDG&E made toward addressing areas for continued improvement identified in Energy Safety's 2022 WMP Decision. See Appendix B for the status

[170] SDG&E's 2023-2025 WMP, page 405.

[171] SDG&E's 2023-2025 WMP, OEIS Table 9-5 "PSPS Targets," page 411.

[172] SDG&E's 2023-2025 WMP, pages 161-163.

[173] SDG&E's 2023-2025 WMP, Appendix G, AFN Plan, page 16.

[174] SDG&E's 2023-2025 WMP, Appendix G, AFN Plan, pages 13-14.

of each 2022 area for continued improvement. Notable progress was made in the following selected areas:

In response to SDGE-22-30, Improvements to the WiNGS-Ops and WiNGS-Planning Models, SDG&E reports significant progress toward incorporating the WiNGS-Ops model in the PSPS decision-making process. Notably, SDG&E enhanced its risk model at the transformer level to better estimate the impact of PSPS events on customers. Additionally, SDG&E conducted a study to validate subject matter expert assumptions and retrained its models on new observations collected in 2021.[175]

SDG&E also reports improvements to its PSPS quantification, including progress on its in-development methodology to track risk mitigated over multiple years from covered conductor and undergrounding. As the models and PSPS risk framework mature, Energy Safety will look for SDG&E to improve how PSPS risk is quantified separately from ignition risk and how PSPS risk reduction is calculated from each individual mitigation activity.

9.4 Areas for Continued Improvement

Energy Safety has no areas for continued improvement for SDG&E under the PSPS section of its Base WMP.

[175] SDG&E's 2023-2025 WMP, Appendix D, p. 36.

10. SDG&E's Process for Continuous Improvement

In response to Sections 10, 11, and 12 of the Technical Guidelines,[176] SDG&E provided information on its lessons learned, a description of its corrective action program, and information on any Notices of Violation or Notices of Defects it has received.

Below is Energy Safety's evaluation regarding these steps to drive continuous improvement.

10.1 Lessons Learned

Section 10 of the Technical Guidelines requires a utility to use lessons learned to drive continuous improvement in its WMP. Lessons learned can be divided into the three main categories: (1) internal monitoring and evaluation, (2) external collaboration with other electrical corporations, and (3) feedback from Energy Safety or other authoritative bodies. This section includes an assessment of SDG&E's implementation of lessons learned.

SDG&E has developed 14 proposed WMP improvements based on lessons learned from 2008-2022 of which three have been completed.[177] Most of the lessons learned are related to areas for continued improvement required by Energy Safety in response to SDG&E's 2022 WMP Update. The lessons learned range from greater use of technology to improving SDG&E's engagement with people, such as by soliciting and evaluating ideas from frontline personnel on wildfire safety and PSPS. SDG&E also reports that it is surveying customers to assess campaign effectiveness and communication preferences to inform future campaigns to reach customers.

In addition to improving the involvement of both customers and personnel, SDG&E reports that it is making improvements through use of technology. One example involves combining information from an artificial intelligence (AI) infrared camera smoke detection algorithm, satellite fire detection, and mountaintop cameras to assist in identifying fires soon after ignition. SDG&E indicates another technology-related lesson learned in its use of a Machine Learning Wind Gust model at all 215 weather stations in the HFTD (of 222 total weather stations) to improve situational awareness 72 hours prior to a PSPS or Red Flag Warning event.

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[176] Technical Guidelines, Section 10, pages 207-209; Section 11, pages 210-211; Section 12, pages 212-213 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53286&shareable=true, accessed May 5, 2023).

[177] SDG&E's 2023-2025 WMP, OEIS Table 10-1 "Lessons Learned," pages 428-431.

10.2 Corrective Action Program

Section 11 of the Technical Guidelines requires a utility to describe its corrective action program and a summary of the relevant portions of its existing procedures. This section includes an assessment of SDG&E's implementation of its Corrective Action Program (CAP) relative to wildfire safety, including how it prevents recurrence of risk events; addresses findings from wildfire investigations; addresses findings from Energy Safety Compliance Assurance Division; and addresses areas for continued improvement identified by Energy Safety as applicable.

SDG&E describes its CAP[178] and reports on how its activities are designed to prevent the recurrence of risk events, address findings from wildfire investigations, address findings from Energy Safety's Compliance Assurance Division, and address areas for continued improvement identified by Energy Safety.

SDG&E reports that it consistently reviews its WMP and WMP initiatives to promote continual updates of best practices. SDG&E states that it benchmarks with other utilities and participates in various joint utility working groups to ensure the appropriate mitigations are in place to address the risk of wildfire.

SDG&E explains that as it identifies areas to improve (e.g., via lessons learned, wildfire investigations, Energy Safety findings), it reviews and vets those opportunities through its CAP. SDG&E provides several examples, such as tracking risk events and ignitions. These reported events allow SDG&E to observe potential trends and identify opportunities to reduce the occurrence. SDG&E indicates that its Ignition Management Program performs a root cause analysis for all ignitions and works with the appropriate business unit to identify remedies to prevent recurrence.

Energy Safety is satisfied with SDG&E's CAP and process as outlined in its WMP.

10.3 Areas for Continued Improvement

Energy Safety has no areas for continued improvement for SDG&E in these areas of its Base WMP.

[178] SDG&E's 2023-2025 WMP, pages 433-437.

11. Required Areas for Continued Improvement

Energy Safety's evaluation of the 2023-2025 WMPs focused on each utility's strategies for reducing the risk of utility-related ignitions. The evaluation included assessing the utility's progress implementing wildfire mitigation initiatives, evaluating the feasibility of its strategies, and measuring year-to-year trends. As a result of this evaluation, Energy Safety identified areas where the utility should continue to improve its wildfire mitigation capabilities in future plans. The complete list of all SDG&E's areas for continued improvement follows below.

11.1 Risk Methodology and Assessment

- **SDGE-23-01. Cross-Utility Collaboration on Risk Model Development**
  - Description: SDG&E and the other IOUs have participated in past Energy Safety-sponsored risk model working group meetings. The risk model working group meetings facilitate collaboration among the IOUs on complex technical issues related to risk modeling. The risk model working group meetings are ongoing.
  - Required Progress: SDG&E and the other IOUs must continue to participate in all Energy Safety-organized risk model working group meetings.
  - Discussed in Section 6, "Risk Methodology and Assessment."

- **SDGE-23-02. Calculating Risk Scores Using Maximum Consequence Values**
  - Description: SDG&E's use of maximum consequence values, as opposed to probability distributions or averages, to aggregate risk scores is not aligned with fundamental mathematical standards and could lead to suboptimal mitigation prioritization decisions.
  - Required Progress: In its 2025 Update, SDG&E must:
    - Provide a plan with milestones for transitioning from using maximum consequence values to either probability distributions or averages in its 2026-2028 Base WMP.
    - If SDG&E is unable to transition to using probability distributions or averages, it must explain the reason and propose an alternative strategy that would produce risk scores closer to what using the probability distributions or average consequences would produce.
  - Discussed in Section 6, "Risk Methodology and Assessment."

- **SDGE-23-03. PSPS and Wildfire Risk Trade-Off Transparency**
  - Description: SDG&E does not provide adequate transparency regarding PSPS and wildfire risk trade-offs, or how it uses risk ranking and risk buy-down to determine risk mitigation selection.
  - Required Progress: In its 2025 Update, SDG&E must describe:
    - How it prioritizes PSPS risk in its risk-based decisions, including trade-offs between wildfire risk and PSPS risk.
    - How the rank order of its planned mitigation initiatives compares to the rank order of mitigation initiatives ranked by risk buy-down estimate, along with an explanation for any instances where the order differs.
  - Discussed in Section 6, "Risk Methodology and Assessment"; Section 7, "Wildfire Mitigation Strategy Development."

- **SDGE-23-04. Incorporation of Extreme Weather Scenarios into Planning Models**
  - Description: SDG&E currently relies on wind conditions data representing the past 13 years that do not consider rare but foreseeable and significant risks. SDG&E does not evaluate the risk of extreme wind events in its service territory to prioritize its wildfire mitigations using WiNGS-Planning.
  - Required Progress: In its 2026-2028 Base WMP, SDG&E must report on its progress developing statistical estimates of potential wind events over at least the maximum asset life for its system and evaluate results from incorporating these into WiNGS-Planning when developing its mitigation initiative portfolio or explain why the approach would not serve as an improvement to its mitigation strategy.
  - Discussed in Section 6, "Risk Methodology and Assessment."

11.2 Wildfire Mitigation Strategy Development

- **SDGE-23-05. Cross-Utility Collaboration on Best Practices for Inclusion of Climate Change Forecasts in Consequence Modeling, Inclusion of Community Vulnerability in Consequence Modeling, and Utility Vegetation Management for Wildfire Safety**
  - Description: SDG&E and the other IOUs have participated in past Energy Safety-sponsored scoping meetings on these topics but have not reported other collaboration efforts.
  - Required Progress: SDG&E and the other IOUs must participate in all Energy Safety-organized activities related to best practices for:

- Inclusion of climate change forecasts in consequence modeling.
- Inclusion of community vulnerability in consequence modeling.
- Utility vegetation management for wildfire safety.

SDG&E must collaborate with the other IOUs on the above-mentioned best practices. In their 2025 Updates, the IOUs (not including independent transmission operators) must provide a status update on any collaboration with each other that has taken place, including a list of any resulting changes made to their WMPs since the 2023-2025 WMP submission.

- Discussed in Section 7, "Wildfire Mitigation Strategy Development"; Section 8.2, "Vegetation Management and Inspections."

- **SDGE-23-06. Demonstration of Proper Decision Making for Selection of Undergrounding Projects**
  - Description: SDG&E is often prioritizing undergrounding over other mitigations through its mitigation decision-making process and does not provide adequate justification for its undergrounding projects.
  - Required Progress: In its 2025 Update, SDG&E must provide an analysis demonstrating its process for the selection of undergrounding projects, which must include:
    - Location-specific ignition driver analysis.
    - Location-specific undergrounding effectiveness compared to combinations of mitigations (such as covered conductor, early fault detection, and sensitive relay profile).
    - Developing an estimate of the cumulative risk exposure of its mitigation initiative portfolio taking into account the time value of risk as part of mitigation comparisons.
    - Addressing any remaining risk via interim measures for any planned covered conductor projects.
    - If applicable, adjustments to SDG&E's hardening scope to account for the above evaluation.
  - Discussed in Section 7, "Wildfire Mitigation Strategy Development."

- **SDGE-23-07: Third-Party Recommendations for Model Improvements**
  - Description: SDG&E has not provided a plan to implement improvements identified for its risk modeling from its third-party consultant.
  - Required Progress: In its 2025 Update, SDG&E must provide an update on its implementation of the following recommended improvements:

- Inclusion of its Vegetation Risk Index and how this index informs vegetation management decisions.
- Use of its risk model to inform mitigation work outside of grid hardening.
- Sensitivity analysis for risk buy-down, mitigations, and PSPS models.
- Elimination of double-counting of conductor age and circuit health index within models.
- SDG&E must also provide a list of recommendations from the Table of Recommendations in its consultant's May 2023 report that it is adopting with the timeline for each recommendation's implementation and a list of recommendations it is not adopting, if any, with an explanation on why SDG&E is not adopting a recommendation.

  - Discussed in Section 7, "Wildfire Mitigation Strategy Development."

11.3 Grid Design, Operations, and Maintenance

- **SDGE-23-08. Continuation of Grid Hardening Joint Studies**
  - Description: The utilities have jointly made progress addressing the continued Joint IOU Covered Conductor Working Group area for continued improvement (SDGE-22-11 and SDGE-22-13). Energy Safety expects the utilities to continue these efforts and meet the requirements of this ongoing area for continued improvement.
  - Required Progress: In its 2025 Update, SDG&E, along with all other IOUs (not including independent transmission operators), must report on the progress and outcomes of the studies and meetings discussed in the Joint IOU Covered Conductor Working Group Report. This must include:
    - Progress made on any next steps included in the report.
    - A description of any lessons learned SDG&E has applied to its WMP, including a list of applicable changes.
    - A summary of any completed workshops, including a list of topics and dates, and takeaways.
    - A list of additional workshops and proposed dates.

    Additionally, SDG&E must continue to collaborate with other utilities on efforts relating to grid hardening. In its 2026-2028 Base WMP, SDG&E, along with other utilities, must submit a report which discusses continued efforts including:
    - The IOUs' joint evaluation of the effectiveness of undergrounding. This must account for any remaining risk from secondary or service lines,

analysis on in-field observations from potential failure points of underground equipment, and ignition risk as well as PSPS risk.

- The IOUs' joint lessons learned on undergrounding applications. This must include use of resources to accommodate applicable expansion of undergrounding programs, any new technologies being applied to undergrounding, and cost or deployment maximization efforts being used.
- The IOUs' joint evaluation of various approaches to implementation of protective equipment and device settings. This must include analysis of the effectiveness of various settings, lessons learned on how to minimize reliability and associated safety impacts (including use of downed conductor detection and partial voltage detection devices), variations on settings being used including thresholds of enablement, and equipment types in which such settings are being adjusted.
- The IOUs' continued efforts to evaluate new technologies being piloted and deployed. This must include, but not be limited to: REFCL, EFD, DFA, falling conductor protection, use of smart meter data, open phase detection, remote grids, and microgrids.

  - Discussed in Section 8.1, "Grid Design, Operations, and Maintenance" (8.1.2 "Grid Design and System Hardening").

- **SDGE-23-09: New Technologies Evaluation and REFCL Implementation**
  - Description: SDG&E has not moved forward with piloting REFCL, or explained why it is not exploring the technology.
  - Required Progress: In its 2025 Update, SDG&E must provide an update on its progress evaluating the use of REFCL as a mitigation or provide an explanation why SDG&E finds REFCL not logical and/or feasible to use as a mitigation.
  - Discussed in Section 8.1, "Grid Design, Operations, and Maintenance" (8.1.2 "Grid Design and System Hardening").

- **SDGE-23-10. Early Fault Detection Implementation**
  - Description: SDG&E plans to install early fault detection (EFD) technology at 180 locations during this WMP cycle. As SDG&E's EFD deployment program matures, Energy Safety needs SDG&E to report on its performance and effectiveness.
  - Required Progress: In its 2025 Update, SDG&E must:
    - Provide analysis of using EFD in combination with other hardening efforts, such as covered conductor and traditional hardening, to

maximize possible risk reduction. If applicable, SDG&E may adjust its EFD scope and prioritization accordingly to maximize these benefits.

- Document the performance of deployed EFD in identifying incipient faults, including the number of potential incipient faults detected and their accuracy.
- Document any instances where the early fault detection sensors successfully prevented or mitigated a potential ignition.
- Provide additional details on any maintenance requirements related to EFD.

- Discussed in Section 8.1, "Grid Design, Operations, and Maintenance" (8.1.2 "Grid Design and System Hardening").

- **SDGE-23-11: Changes to Scope of Falling Conductor Protection Program**
  - Description: SDG&E has descoped some of its falling conductor protection (FCP) projects in favor of strategic undergrounding.
  - Required Progress: In its 2025 Update, SDG&E must provide the following for any circuit segments originally scoped for FCP that are now targeted for strategic undergrounding:
    - A list of projects that were descoped, including circuit segment name/ID, length, and associated risk score.
    - Demonstration of considerations for cost/benefit analysis, deployment time, interim mitigation needs, and mitigation effectiveness for reducing ignition risk (including FCP in combination with covered conductor).
    - Adjustments to FCP targets based on the above analysis, if applicable.
  - Discussed in Section 8.1, "Grid Design, Operations, and Maintenance" (8.1.2 "Grid Design and System Hardening").

- **SDGE-23-12: Covered Conductor Inspection and Maintenance**
  - Description: SDG&E has not shown that its current inspection and maintenance procedures have been updated to specifically address covered conductor. In particular, SDG&E has not identified any changes that it will make to its inspection and maintenance procedures to address failure modes specifically related to covered conductor.
  - Required Progress: In its 2025 Update, SDG&E must discuss how failure modes unique to covered conductor will be accounted for in its inspections, including:
    - Water intrusion.

    - Splice covers.
    - Surface damage.

  If SDG&E determines any or all the preceding changes are unnecessary, then it must discuss how its current inspection and maintenance processes adequately address covered conductor failure modes.
- Discussed in Section 8.1, "Grid Design, Operations, and Maintenance" (8.1.3 "Asset Inspections").

- **SDGE-23-13: QA/QC for Inspections**
  - Description: SDG&E is not adequately capturing findings when determining QA/QC pass rates for inspections. This may be related to SDG&E's new practice of exclusively using drones to perform QA/QC of detailed inspections, given that drones have different findings than detailed inspections.
  - Required Progress: In its 2025 Update, SDG&E must:
    - Describe how it has augmented its current QA/QC program to include desktop and direct field review or demonstrate that drone inspections alone adequately cover QA/QC for detailed inspections.
    - Discuss how all findings during QA/QC audits inform SDG&E's changes to inspections moving forward, including any feedback loops, analysis of potential trends, and updates needed for training or procedures.
    - Provide data analysis on work orders found during QA/QC audits of asset inspections from 2021-2023, including the total number of findings and the rate of such findings (i.e., percentage of structures that had work orders opened during QA/QC audit).
  - Discussed in Section 8.1, "Grid Design, Operations, and Maintenance" (8.1.3 "Asset Inspections").

- **SDGE-23-14. Equipment Maintenance and Repair Maturity Level**
  - Description: SDG&E does not project adequate maturity level growth for equipment maintenance and repair.
  - Required Progress: In its 2025 Update, SDG&E must provide a plan to increase its maturity level for equipment maintenance and repair. This must include discussion of the following:
    - Accounting for performance history of individual equipment when establishing maintenance frequency.
    - Estimating equipment service life reduction based on usage and environmental conditions.

        - Including risk buy-down estimates when prioritizing its asset maintenance.
    - Discussed in Section 8.1, "Grid Design, Operations, and Maintenance" (8.1.4 "Equipment Maintenance and Repair").

- **SDGE-23-15. Evaluation of Sensitive Relay Profile in Highest Risk Areas**
    - Description: SDG&E does not plan to expand its sensitive relay profile (SRP) program, nor does SDG&E show whether existing SRP coverage includes SDG&E's highest risk areas.
    - Required Progress: In its 2025 Update, SDG&E must:
        - Provide an analysis showing the current coverage of SRP in SDG&E's highest risk areas based on SDG&E's risk models.
        - Based on this analysis, provide updated targets for installing new devices for SRP coverage. This must include ensuring SRP coverage of the highest risk areas not already covered by SRP, or, alternatively, an analysis showing why this coverage is not needed.
    - Discussed in Section 8.1, "Grid Design, Operations, and Maintenance" (8.1.5 "Grid Operations and Procedures").

11.4 Vegetation Management and Inspections

- **SDGE-23-16. Updates on Identifying Additional, Proactive HFTD Inspections**
    - Description: SDG&E is developing additional, proactive inspections within the HFTD. As SDG&E's proactive HFTD inspections program matures, Energy Safety will evaluate its quality.
    - Required Progress: SDG&E must provide Energy Safety and WMP stakeholders updates on efforts to foster collaborative learning and improvement across the industry. In its 2026-2028 Base WMP, SDG&E must report on:
        - Any efforts to identify new opportunities for vegetation inspections or new inspection techniques.
        - The effectiveness of newly identified inspection opportunities.

        - Whether SDG&E plans to implement these inspections on a permanent basis and the justification if they are made permanent.[179]
    - Discussed in Section 8.2, "Vegetation Management and Inspections."

- **SDGE-23-17. Continuation of Effectiveness of Enhanced Clearances Joint Study**
    - Description: The large IOUs have jointly made progress addressing the Progression of Effectiveness of Enhanced Clearances Joint Study 2022 area for continued improvement (SDGE-22-20, PGE-22-28, and SCE-22-18). Energy Safety expects the large IOUs and their contracted third party to continue their efforts and meet the requirements of this ongoing area for continued improvement.[180]
    - Required Progress: In its 2025 Update, SDG&E, along with PG&E and SCE, must report on the progress and outcomes of the third-party contractor's analysis and evaluation of the effectiveness of enhanced clearances. This must include:
        - A list of the aligned variables related to vegetation risk events.
        - A description of the chosen database type and architecture to warehouse the data.
        - A description of how the third-party contractor incorporated biotic and abiotic factors into its analysis.[181]
        - The third-party contractor's assessment of the effectiveness of enhanced clearances including, but not limited to, the effectiveness of enhanced clearances in reducing tree-caused outages and ignitions.[182]

      Additionally, SDGE-22-20 established the expectation that the large IOUs make incremental progress and update their analyses with each WMP submission

[179] These remedies are adapted from comments on SDG&E's 2023-2025 WMP from the Public Advocates Office at the California Public Utilities Commission (Cal Advocates) in "Comments of the Public Advocates Office on the 2023 to 2025 Wildfire Mitigation Plans of the Large Investor-Owned Utilities," dated May 26, 2023, page 76 (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53966&shareable=true, accessed July 13, 2023).

[180] The objectives for the Enhanced Clearances Joint Study were defined in SDG&E-21-04, Action Statement on 2021 Wildfire Mitigation Plan Update – San Diego Gas & Electric, page 53 (https://energysafety.ca.gov/wp-content/uploads/tn10257_20210720t164339_revised_final_action_statement_on_san_diego_gas__electr.pdf, accessed July 18, 2023).

[181] Biotic factors include all living things (e.g., an animal or plant) that influence or affect an ecosystem and the organisms in it; abiotic factors include all nonliving conditions or things (e.g., climate or habitat) that influence or affect an ecosystem and the organisms in it.

[182] Energy Safety acknowledges that the projected conclusion of the third party's assessment in March 2024 may coincide with the submission of SCE's 2025 Update. If the third party's assessment is not prepared by the time of the 2025 Update submission, the IOUs must provide the third party's assessment as soon as its finalized.

through at least 2025. With its 2026-2028 Base WMP, SDG&E, along with PG&E and SCE, must attach a white paper which discusses:

- The IOUs' joint evaluation of the effectiveness of enhanced clearances including, but not limited to, the effectiveness of enhanced clearances in reducing tree-caused outages and ignitions.
- The IOUs' joint recommendations for updates and changes to utility vegetation management operations and best management practices for wildfire safety based on this study. This may include the IOUs' recommendations for updates to regulations related to clearance distances.

  - Discussed in Section 8.2, "Vegetation Management and Inspections."

11.5 Situational Awareness and Forecasting

- **SDGE-23-18. Update Targets Table with Planned Improvements' Measurable Targets**
  - Description: SDG&E includes measurable targets in its planned improvements section of its initiatives. However, these targets are not included in OEIS Table 8-23 "Situational Awareness Initiative Targets by Year."[183]
  - Required Progress: In its 2025 Update, SDG&E must provide a more comprehensive list of measurable targets in its table "Situational Awareness Initiative Targets by Year," including targets included in its planned improvements section along with relevant timelines to track progress.
  - Discussed in Section 8.3, "Situational Awareness and Forecasting."

- **SDGE-23-19. Weather Station Maintenance and Calibration**
  - Description: SDG&E reports having 222 weather stations in its network that collect weather data. Frequent calibration and maintenance of weather stations is crucial for ensuring accurate, reliable, and high-quality data. As SDG&E performs its annual weather station maintenance and calibration, Energy Safety will need SDG&E to report on the following to verify the integrity of the data collected from its weather station network.
  - Required Progress: SDG&E must:

[183] SDG&E's 2023-2025 WMP, OEIS Table 8-23 "Situational Awareness Initiative Targets by Year," page 296.

- Continue to maintain and keep a log of all the annual maintenance and calibration for each weather station, including the station name, location, conducted maintenance, in compliance with SDG&E's weather station calibration training document,[184] as well as document the annual replacement of the fuel sensors listed in the above reference. The document must also include the length of time from initiation of a repair ticket to completion and the corrective maintenance performed to bring the station back into functioning condition.

In its 2025 Update, provide documentation indicating the number of weather stations that received their annual calibration, and the number of stations that were unable to undergo annual maintenance and/or calibration due to factors such as remote location, weather conditions, customer refusals, environmental concerns, and safety issues. This documentation must include:

- The station name and location.
- The reason for the inability to conduct maintenance and/or calibration.
- The length of time since the last maintenance and calibration.
- The number of attempted but incomplete maintenance or calibration events for these stations in each calendar year.

- Discussed in Section 8.3, "Situational Awareness and Forecasting."

[184] Data Request OEIS-P-WMP-2023-SDGE-002 (Question 2.a.i) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54137&shareable=true, accessed July 27, 2023); Attachments pertaining to Question 2.a.i: "Weather Monitoring System" (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54134&shareable=true, accessed July 27, 2023) and "Weather Station Calibration Training 2023" (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=54138&shareable=true, accessed July 27, 2023).

12. Conclusion

SDG&E's 2023-2025 Wildfire Mitigation Plan is approved.

Catastrophic wildfires remain a serious threat to the health and safety of Californians. Electrical corporations, including SDG&E, must continue to make progress toward reducing utility-related ignition risk. Energy Safety expects SDG&E to effectively implement its wildfire mitigation activities to reduce the risk of utility-related ignitions and the potential catastrophic consequences if an ignition occurs, as well as to reduce the scale, scope, and frequency of PSPS events. SDG&E must meet the commitments in its WMP and fully address Areas for Continued Improvement identified within this Decision to ensure it meaningfully reduces utility-related ignition and PSPS risk within its service territory over the plan cycle.

Shannon O'Rourke
Deputy Director | Electrical Infrastructure Directorate
Office of Energy Infrastructure Safety

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APPENDICES

APPENDICES

Appendix A. Glossary of Terms

Term	Definition
AFN	Access and functional needs
BVES	Bear Valley Electric Service
CAISO	California Independent System Operator
Cal Advocates	The Public Advocates Office at the California Public Utilities Commission
CAL FIRE	California Department of Forestry and Fire Protection
Cal OES	California Governor's Office of Emergency Services
CAP	Corrective Action Program
CBO	Community-based organization
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEJA	California Environmental Justice Alliance

Term	Definition
CNRA	California Natural Resources Agency
CPUC	California Public Utilities Commission
D.	CPUC decision
DR	Data request
DWR	Department of Water Resources
EBMUD	East Bay Municipal Utility District
EFD	Early fault detection
EPUC	Energy Producers and Users Coalition
EVM	Enhanced vegetation management
FERC	Federal Energy Regulatory Commission
FPI	Fire potential index
FWI	Fire weather index
GFN	Ground-fault neutralizers
GIS	Geographic information systems

Term	Definition
GO	General order
GPI	The Green Power Institute
GRC	General rate case
HD	High definition
HFRA	High Fire Risk Area
HFTD	High fire threat district
HWT or Horizon West	Horizon West Transmission
I.	CPUC Investigation
ICS	Incident command system or structure
IOU	Investor-owned utility
IR	Infrared
ISA	International Society of Arboriculture
ITO	Independent transmission operator

Term	Definition
kV	Kilovolt
Liberty	Liberty Utilities
LiDAR	Light detection and ranging
Maturity Model	Electrical Corporation Wildfire Mitigation Maturity Model
Maturity Survey	Electrical Corporation Wildfire Mitigation Maturity Survey
MAVF	Multi-attribute value function
MBL	Medical Baseline
MGRA	Mussey Grade Road Alliance
ML	Machine learning
NDVI	Normalized difference vegetation index
NERC	North American Electric Reliability Corporation
NFDRS	National Fire Danger Rating System
NOD	Notice of defect

Term	Definition
NOV	Notice of violation
OCM	Overhead circuit miles
OEIS or Energy Safety	Office of Energy Infrastructure Safety
PG&E	Pacific Gas and Electric Company
PoF	Probability of failure
PoI	Probability of ignition
PRC	Public Resources Code
PSPS	Public Safety Power Shutoff
Pub. Util. Code or PU Code	Public Utilities Code
QA	Quality assurance
QC	Quality control
QDR	Quarterly Data Report
R.	CPUC rulemaking

Term	Definition
RAMP	Risk Assessment and Management Phase
RCRC	Rural County Representatives of California
REFCL	Rapid earth fault current limiter
RFW	Red Flag Warning
RSE	Risk-spend efficiency
SAWTI	Santa Ana Wildfire Threat Index
SCADA	Supervisory control and data acquisition
SCE	Southern California Edison Company
SDG&E	San Diego Gas & Electric Company
S-MAP	Safety Model Assessment Proceeding, now the Risk-Based Decision-Making Framework Proceeding
SMJU	Small and multijurisdictional utility
TAT	Tree Assessment Tool
TBC	Trans Bay Cable

Term	Definition
TURN	The Utility Reform Network
USFS	United States Forest Service
VM	Vegetation management
VRI	Vegetation risk index
WMP	Wildfire Mitigation Plan
WRRM	Wildfire Risk Reduction Model
WSAB	Wildfire Safety Advisory Board
WSD	Wildfire Safety Division
WUI	Wildland-urban interface

Appendix B. Status of 2022 Areas for Continued Improvement

Energy Safety's 2022 Decision[185] for each utility identified areas for continued improvement and associated required progress. Areas for continued improvement are where the utility must continue to improve its wildfire mitigation capabilities. As part of the 2023 WMP evaluation process, Energy Safety has reviewed the progress reported by SDG&E and is satisfied that SDG&E has made sufficient progress in all the identified areas for continued improvement.

Areas for continued improvement identified in 2022 either have been addressed or any outstanding matters are incorporated in the 2023 areas for continued improvement. SDG&E Utility's 2022 areas for continued improvement are listed in Table A-1. The status column indicates whether each has been fully addressed. If not, the column notes where to find more information in this Decision.

[185] Final Decision on SDG&E's 2022 Wildfire Mitigation Plan Update (July 2022) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=52635&shareable=true, accessed August 4, 2023).

Table A-1. SDG&E 2022 Areas for Continued Improvement

ID	Title	Status
SDGE-22-01	Prioritized List of Wildfire Risks and Drivers.	SDG&E has sufficiently addressed the required remedy.
SDGE-22-02	Collaboration and Research in Best Practices in Relation to Climate Change Impacts and Wildfire Risk and Consequence Modeling.	SDG&E has sufficiently addressed the required progress thus far; Energy Safety will continue to monitor progress.
SDGE-22-03	Utility Arborist Training Initiatives.	SDG&E has sufficiently addressed the required progress.
SDGE-22-04	Inclusion of Community Vulnerability in Consequence Modeling.	SDG&E has sufficiently addressed the required progress thus far; Energy Safety will continue to monitor progress.
SDGE-22-05	Fire Suppression Considerations.	SDG&E has sufficiently addressed the required progress thus far; Energy Safety will continue to monitor progress.
SDGE-22-06	Eight-Hour Fire Spread Simulations.	SDG&E has sufficiently addressed the required progress thus far; Energy Safety will continue to monitor progress.
SDGE-22-07	Risk Prioritization for Mitigation Measures.	SDG&E has not sufficiently addressed the required progress. For related areas for

ID	Title	Status
		continued improvement, see Sections 8.1 and 11 of this Decision.
SDGE-22-08	Evaluation of Wildfire Risk Outside of the HFTD.	SDG&E has sufficiently addressed the required progress thus far; Energy Safety will continue to monitor progress.
SDGE-22-09	Evaluation of Wind Gust Effects on Vegetation-Related Failures.	SDG&E has sufficiently addressed the required progress thus far; Energy Safety will continue to monitor progress.
SDGE-22-10	Wildfire Consequence Modeling Improvements.	SDG&E has sufficiently addressed the required progress.
SDGE-22-11	Applying Joint Lessons Learned Concerning Covered Conductor.	SDG&E has sufficiently addressed the required progress. For related areas for continued improvement, see Sections 8.1 and 11 of this Decision.
SDGE-22-12	Covered Conductor Inspection and Maintenance.	SDG&E has not sufficiently addressed the required progress. For related areas for continued improvement, see Sections 8.1 and 11 of this Decision.
SDGE-22-13	New Technologies Evaluation and Implementation.	SDG&E has not sufficiently addressed the required progress. For related areas for continued improvement, see Sections 8.1 and 11 of this Decision.

ID	Title	Status
SDGE-22-14	Grid Hardening Decision-Making Process Transparency.	SDG&E has not sufficiently addressed the required progress. For related areas for continued improvement, see Sections 7 and 11 of this Decision.
SDGE-22-15	Undergrounding Risk-Spend Efficiency Demonstration.	SDG&E has not sufficiently addressed the required progress. For related areas for continued improvement, see Sections 7, 8.1, and 11 of this Decision.
SDGE-22-16	Enabling Circuits with Advanced Protection.	SDG&E has sufficiently addressed the required progress. For related areas for continued improvement, see Sections 8.1 and 11 of this Decision.
SDGE-22-17	Further Development of Integrating Risk-Informed Decision Making for Inspection Scheduling and Planning.	SDG&E has sufficiently addressed the required progress thus far; Energy Safety will continue to monitor progress.
SDGE-22-18	Evaluation and Interpretation of "Other" Equipment Failures.	SDG&E sufficiently addressed the required progress.
SDGE-22-19	Plan to Address Missing Asset Data.	SDG&E has sufficiently addressed the required progress.
SDGE-22-20	Progression of Effectiveness of Enhanced Clearances Joint Study.	SDG&E has sufficiently addressed the required progress. For related areas for continued

ID	Title	Status
		improvement, see Sections 8.2.4 and 11 of this Decision.
SDGE-22-21	Consideration of Alternatives to Fuels Treatment Activity.	SDG&E has sufficiently addressed the required progress.
SDGE-22-22	Participation in Vegetation Management Best Management Practices Scoping Meeting.	SDG&E has sufficiently addressed the required progress.
SDGE-22-23	PSPS Wind Threshold Change Evaluations.	SDG&E has sufficiently addressed the required progress thus far; Energy Safety will continue to monitor progress.
SDGE-22-24	Replacing Protective Devices for Sensitivity Setting Capabilities.	SDG&E has not sufficiently addressed the required progress. For related areas for continued improvement, see Sections 8.1 and 11 of this Decision.
SDGE-22-25	Validation of Vegetation Risk Index (VRI).	SDG&E has sufficiently addressed the required progress. For related areas for continued improvement, see Sections 7 and 11 of this Decision.
SDGE-22-26	Validation of Wildfire Risk Reduction Model (WRRM).	SDG&E has sufficiently addressed the required progress. For related areas for continued improvement, see Sections 7 and 11 of this Decision.

ID	Title	Status
SDGE-22-27	Improvements to Capital Allocation Methodology.	SDG&E has sufficiently addressed the required progress thus far; Energy Safety will continue to monitor progress.
SDGE-22-28	Improvements to the RSE Verification Process.	SDG&E has not sufficiently addressed the required progress. For related areas for continued improvement, see Sections 7 and 11 of this Decision.
SDGE-22-29	Mitigation Plan for Frequently De-Energized Circuits.	SDG&E has sufficiently addressed the required progress.
SDGE-22-30	Improvements to the WiNGS-Ops and WiNGS-Planning Models.	SDG&E has not sufficiently addressed the required progress. For related areas for continued improvement, see Sections 7 and 11 of this Decision.

Appendix C. Stakeholder Data Request Responses Used in WMP Evaluation

Energy Safety appreciates stakeholder involvement in the WMP evaluation process. The following stakeholder data request and utility response was reviewed, used, and cited in this Decision.

PUBLIC ADVOCATES OFFICE DATA REQUEST:
CALADVOCATES-SDGE-2023WMP-13[186]
SDG&E RESPONSE
Date Received: April 25, 2023
Date Submitted: April 28, 2023

QUESTION 7
SDG&E reports, on page 226-227 of its WMP, that its Quality Assurance and Quality Control (QA/QC) of distribution detailed inspections are 100% accurate with zero audit findings in 2022.

Please state the comparable figures (number of audit findings and the accuracy rate) for detailed distribution inspections in:
a) 2019
b) 2020
c) 2021

RESPONSE 7
a-c) For 2019-2021, QA/QC of detailed distribution inspections are 100% accurate with zero audit findings. Because there is a gap in time between the inspection and audit of the inspection, SDG&E does not define any variances in findings as a failure since it is not possible to determine whether the condition was present at the time of inspection. As more imagery is collected with inspections, it may be possible to provide failure information in the future.

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[186] Data Request CALADVOCATES-SDGE-2023WMP-13 (Question 7) (https://www.sdge.com/sites/default/files/regulatory/CalPA-2023-13.pdf, accessed July 17, 2023).

Appendix D. Stakeholder Comments on the 2023-2025 Wildfire Mitigation Plans

Energy Safety invited stakeholders, including members of the public, to provide comments on the utilities' 2023-2025 WMPs. Opening comments on the large IOU WMPs were due on May 26, 2023, and reply comments were due on June 5, 2023. The following individuals and organizations submitted comments:

- California Department of Fish and Wildlife
- California Public Utilities Commission, Public Advocates Office
- City of Moorpark
- Mussey Grade Road Alliance
- Rural County Representatives of California
- The Green Power Institute
- Julia and David Allenby
- Cynthia Barbera
- Curren Meechem Family
- Maureen Isola
- Brenda So
- Southard

Comments received on the 2023-2025 WMPs can be viewed in the 2023-2025 Wildfire Mitigation Plan (2023-2025-WMPs) docket log.

Energy Safety evaluated these comments and concurred with and in some instances incorporated stakeholder input on SDG&E's 2023-2025 WMP.

Energy Safety found the following stakeholder comments to concur with topics already included in Energy Safety's findings:

- Cal Advocates
  - Drone inspections
  - Part of third-party list of improvements from risk model review
  - PSPS and wildfire risk transparency
  - PSPS Risk
  - Revise QA/QC
  - Undergrounding resourcing

- Mussey Grade Road Alliance
  - Hardening decision-making
- The Utility Reform Network
  - Hardening decision-making
  - PSPS and wildfire risk transparency
  - Undergrounding secondary
  - Undergrounding top risk

The following stakeholder comments introduced new information that influenced Energy Safety's findings:

- Cal Advocates
  - SDG&E is looking for additional opportunities to inspect vegetation. Asked as part of an area for continued improvement for SDG&E to report on this new effort in its next Base WMP.

In addition to the above, Energy Safety's evaluation of the utilities' 2023-2025 WMPs benefited from the discovery materials generated by data requests submitted to SDG&E by the some of the stakeholders named above, in particular Cal Advocates; see Appendix C for the associated stakeholder data request.

Appendix E. Stakeholder Comments on the Draft Decision

This appendix will contain Energy Safety's summary of stakeholder comments on Energy Safety's draft Decision on SDG&E's 2023-2025 Wildfire Mitigation Plan.

Appendix F. Maturity Survey Results

Energy Safety's 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model[187] (Maturity Model) and 2023 Electrical Corporation Wildfire Mitigation Maturity Survey[188] (Maturity Survey) together provided a quantitative method to assess the maturity of each utility's wildfire risk mitigation program.

The Maturity Model consists of 37 individual capabilities describing the ability of electrical corporations to mitigate wildfire risk within their service territory. The 37 capabilities are aggregated into seven categories. The seven mitigation categories are:

A. Risk Assessment and Mitigation Selection
B. Situational Awareness and Forecasting
C. Grid Design, Inspections, and Maintenance
D. Vegetation Management and Inspections
E. Grid Operations and Protocols
F. Emergency Preparedness
G. Community Outreach and Engagement

Maturity levels range from 0 (below minimum requirements) to 4 (beyond best practice). Electrical corporations' responses to the Maturity Survey, listed by mitigation category, are depicted in the figures and tables below.

Tables A-1 and A-2 compare the large IOUs' maturity levels across mitigation categories showing minimum values and average values. Figure A-1 shows SDG&E's projected maturity growth throughout the WMP cycle. Figure A-2 provides a one-page look at all SDG&E's maturity levels for the WMP cycle, including at the capability and sub-capability levels, showing both minimum and average calculations.

[187] 2023-2025 Electrical Corporation Wildfire Mitigation Maturity Model (Second Revised Final, Feb. 2023) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53394&shareable=true, accessed May 5, 2023).

[188] 2023 Electrical Corporation Wildfire Mitigation Maturity Survey Revised Final, April 2023) (https://efiling.energysafety.ca.gov/eFiling/Getfile.aspx?fileid=53708&shareable=true, accessed May 5, 2023). This is the version used by Energy Safety when scoring the survey.

Table A-1. Cross-Utility Maturity Level by Category[189] (Minimum Values)

Maturity Category	PG&E		SCE		SDG&E	
	2023	2026	2023	2026	2023	2026
A. Risk Assessment and Mitigation Selection	0.50	0.83	1.00	1.33	1.33	1.33
B. Situational Awareness and Forecasting	0.83	0.83	0.17	0.67	1.17	1.17
C. Grid Design, Inspections, and Maintenance	0.40	1.20	2.00	2.20	2.40	2.60
D. Vegetation Management and Inspections	0.75	2.00	1.25	2.50	2.00	2.75
E. Grid Operations and Protocols	1.40	1.40	1.80	1.80	2.40	2.40
F. Emergency Preparedness	2.00	2.00	2.67	2.67	2.67	3.00
G. Community Outreach and Engagement	3.60	3.60	3.60	4.00	4.00	4.00

[189] Table A-1 displays the utilities' maturity level at the start of the current WMP cycle (2023) and their level at the end of the cycle (2026).

Table A-2. Cross-Utility Maturity Level by Category[190] (Average Values)

Maturity Category	PG&E		SCE		SDG&E	
	2023	2026	2023	2026	2023	2026
A. Risk Assessment and Mitigation Selection	2.19	2.89	2.65	3.28	2.91	2.99
B. Situational Awareness and Forecasting	2.61	2.85	2.25	2.89	3.00	3.04
C. Grid Design, Inspections, and Maintenance	2.30	3.10	2.98	3.18	3.10	3.17
D. Vegetation Management and Inspections	2.63	3.38	3.19	3.63	3.31	3.63
E. Grid Operations and Protocols	2.93	3.21	3.22	3.46	3.67	3.67
F. Emergency Preparedness	3.13	3.24	3.58	3.58	3.39	3.44
G. Community Outreach and Engagement	3.80	3.80	3.73	4.00	4.00	4.00

[190] Table A-2 displays the utilities' maturity level at the start of the current WMP cycle (2023) and their level at the end of the cycle (2026).

Figure A-1. SDG&E's Projected Growth in Maturity throughout Current WMP Cycle by Category

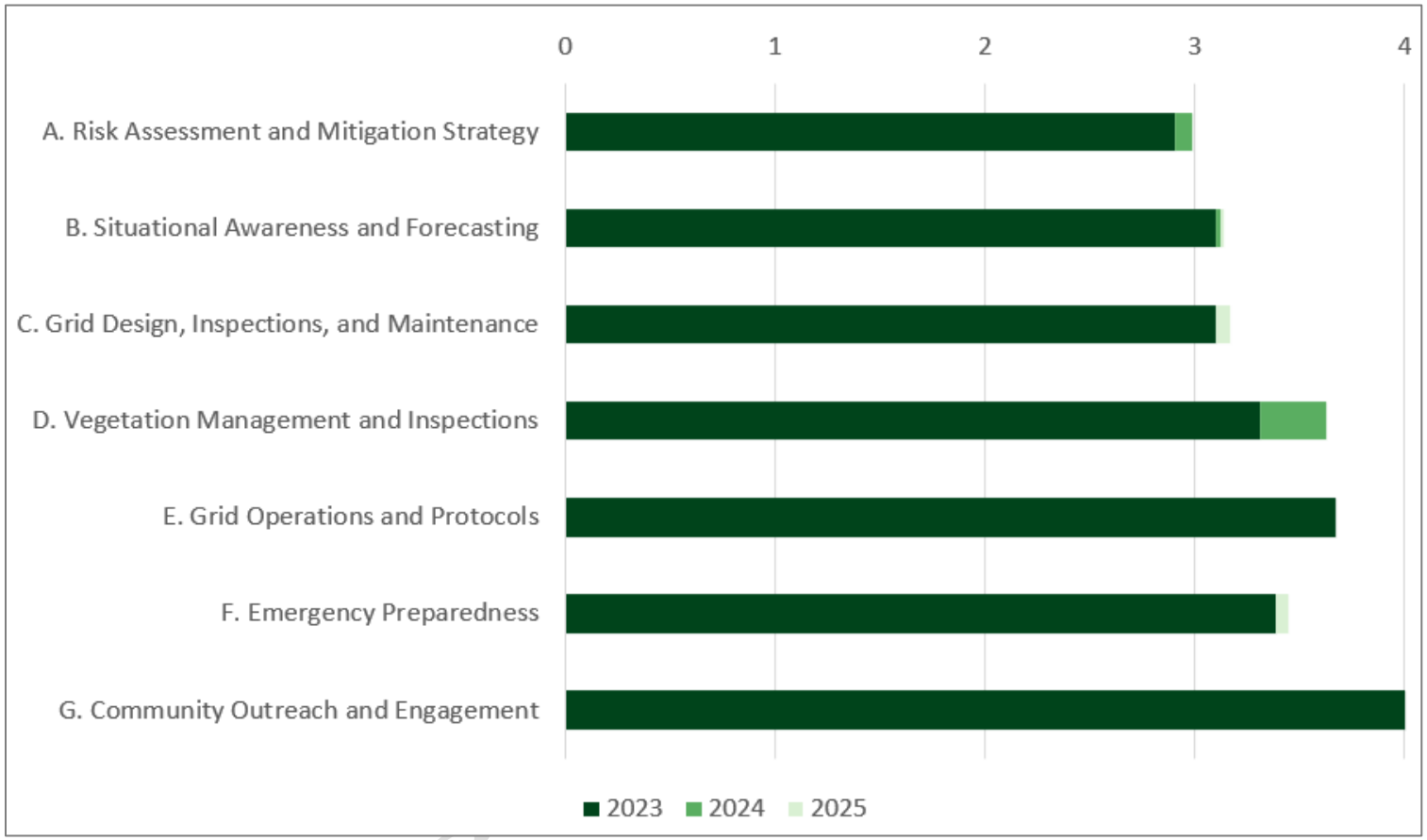

Figure A-2. SDG&E's Comprehensive Maturity Survey Results

		1. Capability				2. Capability				3. Capability				4. Capability				5. Capability				6. Capability			
		2023	2024	2025	2026	2023	2024	2025	2026	2023	2024	2025	2026	2023	2024	2025	2026	2023	2024	2025	2026	2023	2024	2025	2026
A. Risk Assessment and Mitigation Strategy		1. Statistical weather, climate, and wildfire modeling				2. Calculation of wildfire and PSPS risk exposure for societal values				3. Calculation of community vulnerability to wildfire and Public Safety Power Shutoffs (PSPS)				4. Calculation of risk and risk components				5. Risk event tracking and integration of lessons learned				6. Risk-informed wildfire mitigation strategy			
	Minimum of Sub-Cap.	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	3.0	3.0	3.0	3.0	1.0	1.0	1.0	1.0
	Average of Sub-Cap.	2.5	2.5	2.5	2.5	2.9	3.3	3.3	3.3	2.8	2.8	2.8	2.8	3.0	3.1	3.1	3.1	3.6	3.6	3.6	3.6	2.8	2.8	2.8	2.8
B. Situational Awareness and Forecasting		7. Ignition likelihood estimation				8. Weather forecasting ability				9. Wildfire spread forecasting				10. Data collection for near-real-time conditions				11. Wildfire detection and alarm systems				12. Centralized monitoring of real-time conditions			
	Minimum of Sub-Cap.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Average of Sub-Cap.	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	1.7	1.8	1.9	1.9	3.7	3.7	3.7	3.7	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
C. Grid Design, Inspections, and Maintenance		13. Asset inventory and condition database				14. Asset inspections				15. Asset maintenance and repair				16. Grid design and resiliency				17. Asset and grid personnel training and quality							
	Minimum of Sub-Cap.	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	4.0	4.0	4.0	4.0				
	Average of Sub-Cap.	3.5	3.5	3.5	3.5	3.7	3.7	4.0	4.0	1.5	1.5	1.5	1.5	2.8	2.8	2.8	2.8	4.0	4.0	4.0	4.0				
D. Vegetation Management and Inspections		18. Vegetation inventory and condition database				19. Vegetation inspections				20. Vegetation treatment				21. Vegetation personnel training and quality											
	Minimum of Sub-Cap.	1.0	4.0	4.0	4.0	1.0	1.0	1.0	1.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0								
	Average of Sub-Cap.	3.3	4.0	4.0	4.0	2.5	3.0	3.0	3.0	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5								
E. Grid Operations and Protocols		22. Protective equipment and device settings				23. Incorporation of ignition risk factors in grid control				24. PSPS operating model				25. Protocols for PSPS re-energization				26. Ignition prevention and suppression							
	Minimum of Sub-Cap.	4.0	4.0	4.0	4.0	0.0	0.0	0.0	0.0	3.0	3.0	3.0	3.0	1.0	1.0	1.0	1.0	4.0	4.0	4.0	4.0				
	Average of Sub-Cap.	4.0	4.0	4.0	4.0	3.2	3.2	3.2	3.2	3.8	3.8	3.8	3.8	3.3	3.3	3.3	3.3	4.0	4.0	4.0	4.0				
F. Emergency Preparedness		27. Wildfire and PSPS emergency and disaster preparedness plan				28. Collaboration and coordination with public safety partners				29. Public emergency communication strategy				30. Preparedness and planning for service restoration				31. Customer support in wildfire and PSPS emergencies				32. Learning after wildfires and PSPS incidents			
	Minimum of Sub-Cap.	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	0.0	0.0	0.0	0.0	2.0	2.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0
	Average of Sub-Cap.	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.7	2.7	2.7	2.7	3.7	3.7	4.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0
G. Community Outreach and Engagement		33. Public outreach and education awareness				34. Public engagement in electrical corporation wildfire mitigation planning				35. Engagement with AFN and socially vulnerable populations				36. Collaboration on local wildfire mitigation planning				37. Cooperation and best practice sharing with other electrical corporations							
	Minimum of Sub-Cap.	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
	Average of Sub-Cap.	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				