PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Resolution WSD-005
Wildfire Safety Division
June 11, 2020

R E S O L U T I O N

RESOLUTION WSD-005 - Resolution Ratifying Action of the Wildfire Safety Division on San Diego Gas & Electric Company's 2020 Wildfire Mitigation Plan Pursuant to Public Utilities Code Section 8386.

This Resolution ratifies the attached action of the Wildfire Safety Division (WSD) pursuant to Public Utilities Code Section 8386. The California Public Utilities Commission's (Commission) and the WSD's most important responsibility is ensuring the safety of Californians. Since several catastrophic wildfires in the San Diego area in 2007, the equipment of large electric utilities the Commission regulates has been implicated in the most devastating wildfires in our state's history. California's Legislature enacted several legislative measures requiring electrical corporations to submit, and the Commission and the WSD to review, approve or otherwise act on Wildfire Mitigation Plans (WMPs) designed to reduce the risk of utility-caused catastrophic wildfire. Key among the legislative measures are Senate Bill 901 (2018), Assembly Bill 1054 (2019), and Assembly Bill 111, discussed in detail below.

This Resolution (along with several others concurrently being issued with regard to all Commission-regulated electric utilities and independent transmission owners), acts on the WMP submitted on February 7, 2020, of San Diego Gas & Electric Company (SDG&E, filer or electrical corporation), pursuant to Public Utilities Code section 8386.3(a). SDG&E's WMP responds to a list of 22

requirements set forth in Public Utilities Code 8386 and focuses on measures the electrical corporation will take over the next three years to reduce the risk of, and impact from, a catastrophic wildfire caused by its electrical infrastructure and equipment.
Electrical infrastructure and equipment pose ongoing risks of starting wildfires due to the presence of electric current. There are three elements required to start a fire: fuel (such as dry vegetation), oxygen, and an ignition source (heat). A spark from electrical infrastructure and equipment can provide the ignition point from which a wildfire can spread and cause catastrophic harm to life, property, and the environment.

WMPs contain an electrical corporation's detailed plans to reduce the risk of its equipment, operations or facilities igniting a wildfire. This Resolution ratifies the attached action of the WSD, which has conditionally approved SDG&E's 2020 WMP in its Action Statement. In doing so, this Resolution analyzes the extent to which SDG&E's wildfire mitigation efforts objectively reduce wildfire risk, drive improvement, and act as cost effectively as possible. In conducting this evaluation, the Commission considers and incorporates input from the Wildfire Safety Advisory Board, the public and other stakeholders.

PROPOSED OUTCOME:

- Ratifies the attached action of the WSD to approve the 2020 WMP of SDG&E, with conditions designed to ensure the WMP decreases risk of catastrophic wildfire in California.
- A list of conditions of approval is in Appendix A.
- Evaluates the maturity of SDG&E's WMP using the WSD's new Utility Wildfire Mitigation Assessment, as represented in the Utility Wildfire Mitigation Maturity Model. Final maturity model outputs should be viewed as levels or thresholds – they are not absolute scores.

- Requires SDG&E to file an update to its 2020 WMP in 2021 according to a forthcoming schedule to be released by the WSD.
- Does not approve costs attributable to WMPs, as statute requires electrical corporations to seek cost recovery and prove all expenditures are just and reasonable at a future time in their General Rate Cases (GRC). Nothing in this Resolution nor the WSD's Action Statement should be construed as approval of any WMP-related costs.
- Does not establish a defense to any enforcement action for a violation of a Commission decision, order, or rule.

SAFETY CONSIDERATIONS:

Mitigation of catastrophic wildfires in California is among the most important safety challenges the Commission-regulated electrical corporations face. Comprehensive WMPs are essential to safety because:

- WMPs list all of an electrical corporation's proposed actions to reduce utility-related wildfire risk and prevent catastrophic wildfires caused by utility infrastructure and equipment. By implementing measures such as vegetation management, system hardening (such as insulating overhead lines and removing or upgrading equipment most likely to cause fire ignition), improving inspection and maintenance, situational awareness (cameras, weather stations, and use of data to predict areas of highest fire threat), improving community engagement and awareness, and other measures, utility-caused catastrophic wildfire risk should be reduced over time.
- The WSD's and Commission's substantive and procedural changes for evaluations of electrical corporations' 2020 WMPs will enhance California's ability to mitigate catastrophic wildfire risk related to utilities. Below is a summary of the key, new requirements in the 2020 process, required of all WMP filers:

- A WMP template and format so WMPs are standardized and include similar information in the same format.
- Standard data submissions, in spatial, non-spatial and tabular format, which grounds the WMPs in specific data. Data submissions will continue throughout the WMP 3-year horizon and be used to measure compliance and performance to program, progress and outcome metrics.
- A new Utility Survey that objectively assesses the electrical corporation's maturity across 52 capabilities in 10 categories. The resulting Maturity Matrix quantitatively presents the progressive impact of the electrical corporation's wildfire mitigation plan activities over the WMP 3-year horizon.

ESTIMATED COST:

- Nothing in this Resolution should be construed as approval of the costs associated with the WMP mitigation efforts.
- For illustrative purposes, Table 1 below contains filer's estimates of its projected costs for the wildfire mitigation efforts in its 2020 WMP.
- SDG&E may not record the same costs more than once or in more than one place, seek duplicative recovery of costs, or record or seek to recover costs in the memorandum account already recovered separately. All electrical corporations should ensure they carefully document their expenditures in these memorandum accounts, by category, and be prepared for Commission review and audit of the accounts at any time.

Table 1: Proposed WMP costs

Proposed WMP costs	
Total costs 2020-2022	$1.34 billion
Subtotal: 2020	$444 million
Subtotal: 2021	$445 million
Subtotal: 2022	$448 million

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Summary

This Resolution acts on the attached Wildfire Safety Division's (WSD) conditional approval of Wildfire Mitigation Plan (WMP) submitted by San Diego Gas & Electric Company (SDG&E) on February 7, 2020. The Resolution finds that SDG&E is in compliance, subject to conditions, with the requirements for WMPs set forth in Assembly Bill (AB) 1054, codified at Public Utilities Code (Pub. Util. Code) Section 8386(c) and the WMP Guidelines issued by the Commission to electrical corporations. Section 8386 requires that electrical corporations' WMPs contain 22 elements; the full list of elements appears in Appendix E to this Resolution.

There are three possible actions for the WSD and Commission in response to any electrical corporation's WMP: approval, denial, or approval with conditions. In the case of the WMP resolved here, we ratify the WSD's action to approve the SDG&E's WMP with conditions. To the extent we do not impose conditions on elements of the WMP, those elements are approved as plan components. This approval does not relieve the electrical corporation from any and all otherwise applicable permitting, ratemaking, or other legal and regulatory obligations.

The list of conditions of approval is in Appendix A.

1. Background

Catastrophic wildfires in 2017-19 led the California Legislature to pass Senate Bill (SB) 901 in 2018 and its successor AB 1054 in 2019, as well as AB 111. SB 901 and AB 1054 contain detailed requirements for electrical corporations' WMPs and provide a 90-day review cycle of WMPs by the WSD. AB 111 establishes a new division, the WSD, within the Commission. The duties of the WSD are contained in Pub. Util. Code Section 326(a), including to evaluate, oversee and enforce electrical corporations' compliance with wildfire safety requirements, and develop and recommend to the Commission performance metrics to achieve maximum feasible wildfire risk reduction. SB 901 required a formal Commission proceeding for WMP review in 2019, and to that end the Commission reviewed the 2019 WMPs in Rulemaking (R.) 18-10-007. The decisions dispensing of the 2019 WMPs also added additional requirements for the 2020 WMPs.

After the Commission issued its WMP decisions on May 30, 2019,[1] the Legislature enacted AB 1054. AB 1054 contains similar WMP requirements to SB 901 but allows WMPs a three-year rather than one-year duration. AB 1054 also requires the WSD to review and approve, deny or approve with conditions the electrical corporations' WMPs, with Commission ratification to follow thereafter. AB 1054 also requires establishment of a Wildfire Safety Advisory Board (WSAB), with appointees from the California Governor and Legislature, to provide comment on the 2020 WMPs and develop and make recommendations related to the metrics used to evaluate WMPs in 2021 and beyond.[2]

Building on lessons learned from the WMP review process in 2019, the WSD developed and required all electrical corporations to conform their WMPs to a set of new WMP Guidelines starting in 2020.[3] For 2020, the WMP Guidelines add requirements on detail, data, and other supporting information. The WMP Guidelines are designed 1) to increase standardization of information collected on electrical corporations' wildfire risk exposure, 2) enable systematic and uniform review of information each electrical corporation submits, and 3) move electrical corporations toward an effective long-term wildfire mitigation strategy, with systematic tracking of improvements over time.

The Commission adopted Resolution WSD-001 setting forth the process for WSD and Commission review of the 2020 WMPs. The resolution called for electrical corporations to submit their 2020 WMPs on February 7, 2020. SDG&E submitted its WMP on that date.

Shortly after electrical corporations filed their WMPs, the WSD held two sets of all-day workshops over four days, on February 18, 19, 24 and 25. The February 18-19, 2020 informational workshops called for the electrical corporations to present to stakeholders and the public details on their WMPs, and for stakeholders to ask questions, raise concerns, and otherwise comment on the WMPs' contents. The February 24-25, 2020 technical workshops focused more in depth on key provisions of the WMPs: vegetation management, system

[1] Decisions 19-05-036, 037, 038, 039, 040 and 041 (May 30, 2019).

[2] Pub. Util. Code § 8386.3 (Wildfire Safety Division), § 326.1 (Wildfire Safety Advisory Board).

[3] A ruling issued on December 19, 2019 in proceeding R.18-10-007 described and attached all of the material electrical corporations were required to use in submitting their 2020 WMPs.

hardening, risk-spend efficiency emerging technology and reduction of the scale and scope of Public Safety Power Shutoff (PSPS) events. Again, stakeholder and public input was offered.[4]

Stakeholders were also allowed to submit comments on the WMP, to which the electrical corporation replied. Stakeholders and members of the public commented on the WMPs by April 7, 2020, and the electrical corporations responded to those comments by April 16, 2020.

2. Notice

In accordance with Pub. Util. Code § 8386(d), notice of SDG&E's WMP was given by posting of the WMP on the WSD's webpage, at www.cpuc.ca.gov/wildfiremitigationplans, on February 7, 2020, in accordance with the requirements of Pub. Util. Code Section 8386(d). Further, the electrical corporation served its 2020 WMP on the Commission's existing WMP formal proceeding (R.18-10-007) service list, as Resolution WSD-001 provided. Resolution WSD-001 also required the filer to post all data request responses, as well as any document referenced in its WMP, on its own website and update the website with notice to the R.18-10-007 service list on a weekly basis.

3. Wildfire Safety Division Analysis of WMP

To reach a conclusion about each WMP, the WSD reviewed each electrical corporation's 2020 WMP (including updates and Geographic Information System (GIS) data), public and WSAB input, responses to WSD data requests, and responses to the maturity model survey questions. The WSD also issued three sets of data requests to SDG&E for missing information, clarification, and supplementation where necessary. Upon completion of this review, the WSD determined whether SDG&E's 2020 WMP should either be approved without conditions, approved with conditions, or denied.

There are three possible actions for the WSD in response to any electrical corporation's WMP: approval, denial, or approval with conditions. To reach its conclusion, the WSD reviewed the WMPs for compliance with every aspect of

[4] Presentations, agendas and other details of the workshops appear on the Commission's WMP homepage, located at www.cpuc.ca.gov/wildfiremitigationsplans.

the WMP Guidelines and AB 1054 and requirements of the 2019 WMP Decisions. The WSD designed the WMP Guidelines to require that each filer have a comprehensive WMP that contains all elements required by AB 1054. Thus, for example, every WMP must contain plans for vegetation management, system hardening, inspections of assets and vegetation, situational awareness, a plan to reduce and manage PSPS events, customer and first responder outreach and coordination, risk analysis, GIS data, a short- and long-term vision, analysis of causes of ignition, and many other elements. To evaluate WMPs, the WSD assessed each plan for its completeness, the technical feasibility and effectiveness of its initiatives, whether proposed initiatives were an efficient use of resources, and a demonstration of a sufficiently growth-oriented approach to reducing utility-related wildfire risk over time.

A conditional approval explains each missing or inadequate component in the WMP. The 2020 WMP Resolutions for each electrical corporation contain a set of "Deficiencies "and associated "Conditions" to remedy those deficiencies. Each deficiency is categorized into one of the following categories, with Class A being the most serious:

1. Class A – aspects of the WMP are lacking or flawed.
2. Class B – insufficient detail or justification provided in WMP.
3. Class C – gaps in baseline or historical data, as required in 2020 WMP Guidelines.

Class A deficiencies are of the highest concern and require an electrical corporation to develop and submit to the WSD within 45 days of Commission ratification of this Resolution, a Remedial Compliance Plan (RCP) to resolve the identified deficiency. Class B deficiencies are of medium concern and require reporting by the electrical corporation to provide missing data or update its progress in its quarterly report. Such reporting will be either on a one-time basis or ongoing as set forth in each condition. Class C deficiencies require the electrical corporation to submit additional detail and information or otherwise come into compliance in its 2021 annual WMP update. Detailed descriptions of the RCP and quarterly reports are contained in Resolution WSD-002, the Guidance Resolution on 2020 Wildfire Mitigation Plans.

The WSD identified a number of deficiencies in SDG&E's WMP, which can be found in Appendix A.

4. Wildfire Safety Advisory Board Input

The WSAB provided recommendations on the WMPs of SDG&E, Pacific Gas and Electric Company (PG&E), and Southern California Edison Company (SCE) on April 15, 2020. The WSD has considered the WSAB's recommendations, and this Resolution incorporates WSAB's input throughout.

The WSAB focused its recommendations on high-level input and identification of shortcomings in the 2020 WMPs to inform upcoming wildfire mitigation efforts. WSAB recommendations focused on the following areas: vegetation management and inspection; grid design and system hardening; resource allocation methodology; communication with the community, and planning, preparedness, and recovery after PSPS events.

5. Public and Stakeholder Comment

The following individuals and organizations submitted comments on April 7, 2020 on SDG&E's WMP and made the following points:

Many stakeholders found the WMPs lacking in specific and complete data, especially related to Risk Spend Efficiency (RSE). Generally, stakeholders also found comparing utilities difficult due to inconsistent reporting across utilities. The utilities received some appreciation for the general expansion of programs, with some stakeholders noting specific improvements in situational awareness. Many also reiterated that approval of the WMPs neither approves the scope nor portfolio of programs nor authorizes rate recovery.

California Environmental Justice Alliance (CEJA)

- Socioeconomic risk factors are inconsistently considered across programs. Socioeconomic factors should be systematically considered to ensure vulnerable populations are not left behind.
- The investor owned utilities (IOUs) should be required to conduct more analysis to determine the effectiveness of inspections.
- WMPs should be updated to reflect outreach requirements articulated in the D.20-03-004.

Kevin Collins

- The WMPs are too vague and lack clear obligatory completion dates and specific performance targets.
- There are promising proposals in fault detection and situational awareness, but it is unclear if or when they will be installed and operational.

Green Power Institute (GPI)

- The connections between the results of the bowtie analysis, RSE, and proposed WMP activities are unclear.
- SDG&E should provide additional data justifying large clearances and an estimate of the number of line-miles to which they will apply.
- There are large differences in Risk Reduction and RSE values across IOUs for similar vegetation management activities.
- SDG&E's overreliance on Subject Matter Experts to make critical decisions can lead to inconsistencies, errors, and other issues.

Mussey Grade Road Alliance (MGRA)

- Issues in the WMPs should require resolution prior to approval.
- SDG&E should provide cost and safety justification for its choice of steel pole over other pole hardening mechanisms as required in D.19-05-039.
- SDG&E should justify its 25-foot post-trim clearance as laid out in D.19-05-039.
- SDG&E's RSE found covered conductor to be favorable and the WMP should be updated with a more aggressive covered conductor program or an explanation of why it would be inappropriate to implement.

- SDG&E should seek to expand its underground program in HFTD areas if undergrounding truly has an RSE equivalent to other hardening.

Orange County Fire Authority (OCFA)

- PG&E, SCE, and SDG&E should allocate resources to jointly fund the Fire Integrated Real Time Intelligence System (FIRIS) program.

Perimeter Solutions

- The electrical corporations do not discuss the use of fire-retardant products.

Protect Our Communities Foundation (POC)

- SDG&E's metrics are not focused on reducing wildfire risks and fail to address outcomes.
- SDG&E's vegetation management practices, including its 25-foot post-trim clearance, are unreasonable and not supported by scientific evidence.
- SDG&E's hardening decisions are not based on reasonable or proven safety criteria.
- SDG&E's undergrounding proposals are not cost-effective or focused on reducing risk in the highest areas.
- SDG&E's generator grant and microgrid programs are not cost effective.

Public Advocate's Office of the Public Utilities Commission (Cal Advocates)

- SDG&E should revise the system hardening section of its WMP to focus on wildfire risk reduction rather than reliability.
- As required in D.19-05-039, SDG&E should clearly demonstrate that the 25-foot post-prune clearance is feasible and necessary.

- Each utility should submit a supplement demonstrating the accuracy of its wildfire models.
- The utilities are not sufficiently transparent about how resource and operational constraints affect their decision-making.
- Electrical corporations should provide a detailed justification of why undergrounding is an acceptable hardening strategy in locations where it is proposed.

Rural Counties of California Representatives (RCRC)

- More information is needed to better understand the extent the utilities will be able to scale back the use of PSPS events over time.
- Multi-channel communications are essential and electrical corporations should be cautious in assuming that customers can easily "click through" a hyperlink for more information.
- WMPs lack details that are necessary to ensure vulnerable populations are protected.
- A tool should be developed to compare the cost/benefit across utilities.

Alan Stein

- The COVID-19 shutdown has invalidated timelines in the WMPs and the plans should be revised and resubmitted.
- An analysis should be conducted to compare the cost of cutting all trees that can hit lines to the cost of the multi-step process of determining which specific trees to cut.

The Utility Reform Network (TURN)

- Programs should not be authorized for tracking in the wildfire mitigation memorandum account simply because they are claimed to be new or incremental.

- Compliance inspection and repair programs should not be deemed new activities. The utilities should not include traditional maintenance inspection and repair compliance programs as costs in the wildfire mitigation memorandum accounts.

On April 16, 2020, SDG&E submitted reply comments, addressing parties' comments as follows:

- As laid out in AB 1054, the reasonableness review of WMP costs are to take place in the GRC and thus, findings related to cost recovery are not needed.
- There is no reason to adopt TURN's recommendation that electrical corporations should be prohibited from applying for cost recovery a second time after being denied recovery in a prior proceeding.
- SDG&E's 2019 WMP was approved in D.19-05-039 and POC's allegations that SDG&E's 2019 WMP was deficient are unfounded.
- SDG&E agrees with parties who advocate for workshops to refine the WMP Guidelines and Templates in advance of the 2021 WMP updates.
- SDG&E's WMP addresses potential feasibility concerns and constraints, which are discussed in each section where applicable.
- Wildfire risk days were reduced in 2019 from 2017 and 2018, but it does not mean that wildfire risk due to climate change is declining.
- SDG&E disagrees that more discussion of RSE is necessary in future WMPs.
- SDG&E has been working on identifying strategies to reduce PSPS impacts.
- Going forward, RSE calculations on wildfire mitigations should be consistent with the GRC Safety Model and

Assessment Proceeding (S-MAP) and Risk Assessment Mitigation Phase (RAMP).

- SDG&E disagrees with the assertion that its hardening strategy places too much emphasis on service reliability, SDG&E's analysis of segments involves the evaluation of both wildfire and PSPS risks.
- The location of hardening does not necessarily align with the economic characteristics of a population because the location where a fire ignites is different from areas to which it can spread.
- The purpose of choosing an appropriate pole material is to withstand the known local wind conditions, including potential extreme Santa Ana wind events.
- SDG&E agrees with MGRA on the benefits of covered conductor and is committed to further understanding of the technology.
- It is unnecessary and inappropriate to require the submittal of an advice letter justifying an undergrounding project before beginning construction.
- SDG&E is considering only a few hundred miles of highest-risk circuits to underground.
- POC's proposal, to equip all customers in Tier 3 of the HFTD with a solar plus battery storage system, should be rejected.
- SDG&E's Generator Grant Program does not create additional fire threats and provides a means to power critical life support equipment or other small appliances in the event of a PSPS.
- SDG&E is developing the Whole Home Generator Program to serve customers impacted by PSPS, which is implemented to prevent the risk of wildfire and is therefore covered under Public Utilities Code Section 8386.

- SDG&E's drone inspection program supplements current GO 165 inspections and does not replace existing inspection programs.
- SDG&E has an internal audit process examine the effectiveness of inspections.
- Expanded 25-foot clearances, where properly applied, can be an effective mitigation tool. The 25-foot clearance is not intended to be applied universally.
- POC's recommended six-foot separation of vegetation is inadequate to maintain safety.
- The electrical corporations engage through industry conferences and joint meetings to discuss strategy and best practices of their vegetation management programs.

6. Discussion

The Commission has reviewed the actions taken by the WSD pursuant to Public Utilities Code section 8386.3, the recommendations Wildfire Safety Advisory Board (WSAB), stakeholder comments served on the R.18-10-007 service list, the underlying documents, and other public input. The following aspects of the Wildfire Mitigation Plan (WMP) raised concerns to the WSD:

1) *Risk modeling and decision-making*. San Diego Gas and Electric Company's (SDG&E) WMP does not adequately address how SDG&E factors its modeling into decision-making, and whether and how it updates its models based on lessons learned.
2) *Situational awareness and forecasting*. SDG&E's WMP does not adequately address how it utilizes its Fire Potential Index (FPI), or whether it has fully explored early fault detection measures.
3) *Grid design and system hardening*. SDG&E's WMP does not adequately identify or describe the details of its more costly planned investments, or of its decision-making process with respect to its various planned initiatives.

4) *Asset management and inspections*. SDG&E's WMP does not adequately describe the details of its risk assessment process, or whether and how it considers alternatives to identified risk-reduction initiatives.
5) *Vegetation management*. SDG&E's WMP lacks details with which to evaluate its vegetation management practices, in particular whether and how its "enhanced" vegetation management practices provide incremental risk reduction benefits.
6) *Public Safety Power Shutoff (PSPS)*. SDG&E's WMP does not adequately describe SDG&E's current PSPS protocols.
7) *Resource allocation*. SDG&E's WMP does not adequately address the details of its resource allocation process. In particular, the WMP lacks details regarding whether and how specific mitigations or initiatives reduce the need to resort to a PSPS event.

Therefore, the WSD's approval of SDG&E's WMP is conditioned on SDG&E's compliance with each of the conditions set forth in Appendix A.

The following sections discuss in detail the SDG&E's WMP, its contents, required changes, and conditions imposed on approval. The discussion follows the template provided in WMP Guidelines attached to the R.18-10-007 Administrative Law Judge's December 16, 2019 ruling as Attachment 1.

6.1. Persons Responsible for Executing the Plan

This section of the WMP requires that the filer designate a company executive with overall responsibility for the plan, and program owners specific to each component of the plan. The section also requires a senior officer to verify the contents of the plan, and the filer to designate key personnel responsible for major areas of the WMP.

SDG&E provided the required information.

6.2. Metrics and Underlying Data

The metrics and underlying data section of the WMP represents an innovation over the 2019 WMP requirements in that all filers are required to report standardized and normalized data on many aspects, including their performance metrics, conditions in their service territories, grid topology, and wildfire mitigation efforts. To remedy a concern with the 2019 plans, the 2020 WMP Guidelines disallow the practice of filers characterizing only "program targets" (e.g., number of miles of covered conductor installed or trees trimmed) as the "metrics" required by the statute.[10] For 2020, the WMP Guidelines require filers to group metrics and program targets as follows.

- *Progress metrics* track how much electrical corporation wildfire mitigation activity has managed to change the conditions of electrical corporation's wildfire risk exposure in terms of drivers of ignition probability.
- *Outcome metrics* measure the performance of an electrical corporation and its service territory in terms of both leading and lagging indicators of wildfire risk, PSPS risk, and other direct and indirect consequences of wildfire and PSPS, including the potential unintended consequences of wildfire mitigation work.
- *Program targets* measure tracking of proposed wildfire mitigation activities against the scope and pace of those activities as laid out in the WMPs but do not track the efficacy of those activities. The primary use of these program targets in 2020 will be to gauge electrical corporation follow-through on WMPs.

This section first requires filers to discuss how the their plans have evolved since 2019, outline major themes and lessons learned from implementation of their 2019 plan and discuss how the filers performance against metrics used in their 2019 plans have informed their 2020 WMP. A series of tables then requires reporting of recent performance on predefined outcome and progress metrics, including numbers of ignitions, near misses, PSPS events, worker and public

deaths and injuries, acreage affected, and assets destroyed by fire, and critical infrastructure impacts, as well as additional metrics the filer proposes to use to ensure the effectiveness of its efforts in quantitatively mitigating the risk of utility-caused catastrophic wildfire. This section also requires filers to detail their methodology for calculating or modeling potential impact of ignitions, including all data inputs used, data selection and treatment methodologies, assumptions, equations or algorithms used and types of outputs produced. Finally, this section requires filers to provide a number of Geographic Information System (GIS) files detailing spatial information about their service territory and performance, including recent weather patterns, location of recent ignitions, area and duration of PSPS events, location of lines and assets, geographic and population characteristics and location of planned initiatives. A detailed summary and comparison of performance metrics and current state of utility service territories is provided in Appendix B.

Appendix B, Figure 2.2a depicts near misses normalized by circuit miles, and Appendix B, Figure 2.3a depicts normalized ignitions. Appendix B, Figure 2.6a provides a detailed breakdown of ignitions by driver. It is important to consider these data in conjunction to better understand the scope, frequency, and scale of the drivers of utility ignition. Presumably, there are relationships between near misses and ignitions that can better inform utility performance and track progress.

Like PG&E, SDG&E's near miss incidents per circuit mile have fluctuated over the past 5 years; however, SDG&E's fluctuations have not been as drastic – varying by approximately 10-15% annually, and at a much lower range (*i.e.*, between 0.16 and 0.19 incidents per circuit mile as opposed to a range of 0.34 to 0.51 for PG&E). While SDG&E's near miss incidents per circuit mile have fluctuated, SDG&E has been successful in reducing its number of ignitions. Over the past five years, SDG&E's ignitions per circuit mile have been declining or remaining flat, with a clear downward trend. Notably, SDG&E reported a 33% reduction in ignitions per circuit mile from 2018 to 2019, driven by a nearly 70% reduction in contact from object ignitions.

Appendix B, Figure 1.5a shows the total annual Red Flag Warning (RFW) circuit mile days for each reporting year. This figure is leveraged as a proxy for differentiating fire weather potential (as a function of RFWs) year over year for

each IOU. Appendix B, Figure 2.9a shows values for acres burned, total and normalized across the WMP-defined metric of RFW Circuit Mile Days. The intent of this normalizing metric is to account for varying fire weather conditions using a common metric of RFWs. However, it should be noted that additional study and refinement are necessary, as it seems there are inconsistencies in how utilities calculated this value.

As shown in Appendix B, Figure 2.9a, SDG&E reported a total of 213 acres burned in 2015. However, since that time, SDG&E's reported acres burned fell to less than 30 acres annually.

SDG&E's WMP states that key themes and lessons learned from its 2019 wildfire mitigation initiatives include reducing or eliminating PSPS impacts to the extent feasible; development or enhancement of various risk indices to better target vegetation and fuel management operations; use of drones for inspections of distribution assets and exploring the potential for machine learning to detect issues on its electric facilities; utilizing wind variability data to inform PSPS decisions; and further development of program target metrics.

SDG&E was asked to determine how its plan evolved in 2020 as a consequence of these 2019 lessons. In general, SDG&E's WMP reiterates that learnings from the 2019 WMP were harnessed for this 2020 WMP. Although SDG&E's plan does not address major changes or explain whether it has avoided repeating poor choices from 2019, it is apparent from its descriptions of risk factors such as wind variability, and its ability to identify the implications of such studies, that SDG&E has incorporated new findings into its operations and decision-making. SDG&E also acknowledged, in response to a WSD data request, that a key lesson learned from its PSPS metrics is that mitigation efforts such as system hardening should be determined based on a more comprehensive circuit-level or segment-level assessment and not just an asset-level assessment, in order to take into account the grid connectivity and effects of PSPS.

SDG&E stands out from its peers in relation to its GIS capability. SDG&E provided many GIS asset data layers and high levels of asset age information. SDG&E submitted a metadata file that can be opened without the need for specialized software, and provided definitions for various domain codes (e.g., DAR = Insulators-Ceramic, Standard, 20K), which facilitated the WSD's review of

the data. SDG&E provided a very large volume of data requested beyond requirements (e.g., photos with damage locations).

6.3. Baseline Ignition Probability and Wildfire Risk Exposure

The baseline ignition probability and wildfire risk exposure section of the WMP requires electrical corporations to report baseline conditions and recent information related to weather patterns, drivers of ignition probability, use of PSPS, current state of utility equipment, and summary data on weather stations and fault indicators. The section then requires the filer to provide information on its planned additions, removals, and upgrades of equipment and assets by the end of the 3-year plan term, in urban, rural and highly rural areas. The information must describe the scope of hardening efforts (i.e., circuit miles treated), distinguish between efforts for distribution and transmission assets, and identify certain locational characteristics (i.e., urban, rural and highly rural) of targeted areas. Filers must also report the sources of ignition over the past 5 years due to ignition drivers outlined in the annual fire incident data collection report template adopted in D.14-02-015.

Considering that managing the potential sources of ignition from its infrastructure, operations, and equipment is the single most controllable aspect of utility wildfire risk, understanding the sources and drivers of near misses and ignitions is one of the most critical capabilities in reducing utility-caused wildfire risk. Moreover, it is important to consider these performance metrics relative to annual fluctuations in weather conditions (i.e., incidence of RFW days, days with high wind conditions – 95th and 99th percentile winds, and high fire potential days measured relative to utility FPIs or other fire danger rating systems) to better gauge relationships and thresholds between weather and fire potential indicators and utility ignitions. As such, the discussion in this section focuses on recent weather patterns, key drivers of utility ignitions and frequencies of such ignitions, recent use of PSPS, the current baseline conditions of the utility's service territory and equipment, and locations of planned utility upgrades.

Out of the three largest California electrical corporations, SDG&E has the least number of overhead distribution lines with approximately 6,488 circuit miles, which is significantly less than PG&E or SCE overhead distribution circuit miles. SDG&E also has a very high percentage of underground distribution circuit

miles (compared to PG&E and SCE), which is an important mitigation measure to prevent ignitions.

The historical weather patterns provided from SDG&E show an overall increase in RFW days and top 30% FPI, 95th percentile wind conditions, and 99th percentile wind conditions except for 2019. Wind data for the last three years (2017, 2018, 2019) are the highest of the five. This raises concerns for increasing wind-related risks to electrical assets. The types of utility equipment that would increase ignition risk would be any type of equipment that can produce arcs or sparks. This could also include areas where conductors can touch or fail, due to line slap or weakened connections. Further investigation into how wire-to-wire contact / contamination incidents are detected and analyzed and what further mitigation measures are available is warranted.

Additional detailed data for incidents and ignitions for each historical year is needed in the future for further statistical analysis, to assess variance and distribution of ignitions across different incidents. Further, SDG&E should investigate how to utilize the average percentage probability of ignition per incident as a metric to observe annual trends and whether other metrics and statistical data analysis would be prudent to track.

Deficiencies and Conditions – Baseline Ignition and Wildfire Risk Exposure

Contact from objects

Deficiency (SDGE-1, Class B): SDG&E reports a high number of ignitions related to balloon contact.

Although SDG&E has relatively low volume of ignitions (annual average over five-year reporting period of 23, compared to 440 for PG&E and 106 for SCE), over the past five years, SDG&E reports a high percentage (18%) of ignitions related to balloon contact when normalized for overhead circuit miles. Compared to PG&E, SDG&E reports more than three times the rate of such balloon contact ignitions. However, SDG&E's percentage of balloon contact ignitions as a fraction of total ignitions is similar to SCE's, which seems to indicate that this issue is more concentrated in southern California.

Considering the fact that SDG&E has substantially less overhead circuitry, as compared to peer utilities, the higher incidence of balloon caused ignitions potentially correlates to an increased risk from this ignition driver in SDG&E's service territory. However, beyond some targeted covered conductor installation and undergrounding and covered conductor initiatives, SDG&E's WMP lacks detail on which initiatives it is implementing to reduce the risk of balloon contact ignitions.

Condition (SDGE-1, Class B): In its first quarterly report, SDG&E shall:

i) list and describe the actions it is taking to study the occurrence and potential consequence of metallic balloon caused ignitions in its service territory;

ii) efforts it is taking to mitigate the occurrence of such ignitions in the future;

iii) the status of the action and efforts identified in (i) and (ii) above, including timelines for completion;

iv) the specific initiatives in its 2020 WMP that aim to reduce the risk of balloon caused ignitions; and

v) its goals, targets and quantitative measures for evaluating effectiveness of the initiatives identified in (iv) at reducing the risk of balloon caused ignitions.

Deficiency (SDGE-2, Class B): SDG&E reports a high number of ignitions related to vehicle contact.

Although SDG&E has relatively low volume of ignitions (annual average over five-year reporting period of 23, compared to 440 for PG&E and 106 for SCE), over the past five years, SDG&E reports approximately twice the rate of ignitions related to vehicle contact compared to PG&E and SCE, when normalized for overhead circuit miles. Considering the fact that SDG&E has substantially less overhead circuitry, as compared to peer utilities, the higher incidence of vehicle contact ignitions potentially correlates to an increased risk from this ignition driver in SDG&E's service territory. However, beyond undergrounding, SDG&E's WMP lacks detail on which initiatives it is implementing to reduce the risk of vehicle contact ignitions.

Condition (SDGE-2, Class B): In its first quarterly report, SDG&E shall:

i) list and describe the actions it is taking to study the occurrence and potential consequence of vehicle contact caused ignitions in its service territory;

ii) efforts it is taking to mitigate the occurrence of such ignitions in the future;

iii) the status of the action and efforts identified in (i) and (ii) above, including timelines for completion;

iv) the specific initiatives in its 2020 WMP that aim to reduce the risk of vehicle contact caused ignitions; and

v) its goals, targets and quantitative measures for evaluating effectiveness of the initiatives identified in (iv) at reducing the risk of vehicle contact caused ignitions.

Definition/characterization of PSPS events

SDG&E appears to count PSPS events in a manner inconsistent with PG&E and SCE, which complicates efforts to evaluate the use of PSPS across the electrical corporations. Specifically, SDG&E's initial WMP listed 99 PSPS events, reflecting its interpretation of each "event" as a decision on whether to shut off an individual circuit. In response to a WSD data request, SDG&E revised its data to align with its PSPS post-event reports, thus showing four PSPS events. Consistency in how the electrical corporations report data is important.

This deficiency is not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

6.4. Inputs to the Plan, Including Current and Directional Vision for Wildfire Risk Exposure

This section of the WMP requires the filer to rank and discuss trends anticipated to exhibit the greatest change and have the greatest impact on ignition probability and wildfire consequence, within the filer's service territory, over the next 10 years. First, filers must set forth objectives over the following timeframes: Before the upcoming wildfire season, before the next annual update, within the next 3 years, and within the next 10 years.

Filers must describe how the utility assesses wildfire risk in terms of ignition probability and estimated wildfire consequence, using Commission adopted risk assessment requirements (for large electrical corporations) from the General Rate Case (GRC) Safety Model and Assessment Proceeding (S-MAP) and Risk Assessment Mitigation Phase (RAMP). The filer must describe how the utility monitors and accounts for the contribution of weather and fuel to ignition probability and wildfire consequence; identify any areas where the Commission's High Fire Threat District (HFTD) should be modified; and rank trends anticipated to have the greatest impact on ignition probability and wildfire consequence.

A key area which filers are required to address is Public Safety Power Shutoffs., In 2019 electrical corporations proactively shutoff power to millions of customers for multiple days, resulting in numerous cascading consequences, including associated public safety concerns. The Commission has been clear in its judgement that those events were unacceptable and cannot be repeated. The new 2020 WMP Guidelines direct electrical corporations to describe lessons learned from past PSPS events and quantify the projected decrease of circuits and customers affected by PSPS as a result of implementing wildfire mitigation programs and strategies contained in the WMP.

SDG&E's WMP clearly lists and describes its evolving program, with specific reference to the maturity model, and includes a useful table (Table 2 in its WMP) showing where the company expects to be in each of the 10 categories by the years 2023 and 2030. Although this is a useful overview, it lacks detailed timelines for making progress on specific efforts.

SDG&E has invested considerable resources in analyzing weather, vegetation and other data and developing predictive models to identify and reduce the risk of ignition probability, described at length in Section 4.2 of its WMP. As discussed in Section 3 above, one outcome of these efforts was SDG&E's finding that more significant impacts occur as a region reaches its top wind speeds (i.e., 95th and 99th percentiles); SDG&E incorporated this finding into its criteria for initiating a PSPS event in 2019. In 2019, there were no ignitions of consequence

and reduced near misses in areas of consequence; however, SDG&E also implemented its largest single PSPS event to date.[5]

Before the next wildfire season, SDG&E intends to focus on mitigating the impacts of PSPS events on customers by examining further switching opportunities and expanding microgrids and customer generator programs. SDG&E anticipates eliminating impacts to more than 7,000 customers who had previously been subject to a PSPS event. SDG&E does not quantify the projected decrease in circuits affected by PSPS as a result of its wildfire mitigations, but explains it is undergoing a segment-by-segment analysis to identify circuits that could or should be sectionalized. SDG&E's future WMPs must include projections for the decrease in circuits affected by PSPS as a result of its wildfire mitigations.

Over the next 3 years and beyond (*i.e.,* over the next 10 years), SDG&E's WMP anticipates that climate change and its associated impacts on factors such as fuel density and moisture will be the greatest macro trend impacting utility ignition probability and estimated wildfire consequence. SDG&E's 10-year vision for wildfire risk mitigation, therefore, includes efforts at increasing the company's automation of analytics and grid operations and more real-time updates of risk models. With respect to mitigation of PSPS impacts, SDG&E aims to reduce or minimize the customer impacts of PSPS events through a combination of strategic undergrounding, overhead hardening, covered conductor, remote sectionalizing, microgrids, and individual customer generation. SDG&E's WMP explains the company is currently evaluating these options; we expect future updates and WMPs to provide specific progress metrics that enable evaluation of the effectiveness of these efforts.

SDG&E's discussion of ignition probability drivers identifies several factors, including contacts by foreign objects and equipment failure, which have informed its work on system hardening efforts such as installation of covered conductor. This section of the WMP refers to SDG&E's Ignition Management Program, described in Section 5.3.7.4 (Data Governance – Tracking and analysis of near miss data) as a program for tracking ignitions and potential ignitions in

[5] SDG&E's largest recorded PSPS event impacted approximately 27,700 customers. See SDG&E WMP, at 35.

order to perform root cause analysis and identify patterns or correlations, which SDG&E uses to inform metrics, operations and system hardening efforts. As the Ignition Management Program was started recently in 2019 and SDG&E continues to develop it, we expect SDG&E's future WMPs to provide a more detailed and comprehensive description of its methodology for determining ignition probability from events.

6.5. Wildfire Mitigation Activity for Each Year of the 3-Year WMP Term, Including Expected Outcomes of the 3-Year Plan

This section of the WMPs is the heart of the plans and requires the filer to describe each mitigation measure it will undertake to reduce the risk of catastrophic wildfire caused by the utility's infrastructure, operations, and equipment. A description of each type of measure appears below, with elaboration in Appendix D to this Resolution.

First, the WMP Guidelines require a description of the overall wildfire mitigation strategy over the following timeframes: before the upcoming wildfire season, before the next annual update, within the next 3 years and within the next 10 years. The filer is required to describe its approach to determining how to manage wildfire risk (in terms of ignition probability and estimated wildfire consequence) as distinct from other safety risks. The filer is required to summarize its major investments over the past year, lessons learned, and changes planned for 2020-2022; describe challenges associated with limited resources; and outline how the filer expects new technologies to help achieve reduction in wildfire risk.

Section 5 requires the filer to explain how it will monitor and audit the implementation of the plan and lay out the data the filer relies on in operating the grid and keeping it safe. It then requires detailed descriptions of specific mitigations or programs, in the following order:

1) Risk assessment and mapping
2) Situational awareness and forecasting
3) Grid design and system hardening
4) Asset management and inspections
5) Vegetation management and inspections
6) Grid operations and operating protocols, including PSPS

7) Data governance
8) Resource allocation methodology
9) Emergency planning and preparedness
10) Stakeholder cooperation and community engagement.

Below, this Resolution evaluates the mitigations (or initiatives) SDG&E proposed for each of the 10 foregoing categories. After identifying each proposed mitigation or group of mitigations, the Resolution discusses concerns with the proposal, and identifies any conditions imposed. Provided in Appendix B, for illustrative purposes, are summaries of the filer's projected costs across highest total cost initiatives as well as projected costs across the highest category initiatives.

6.5.1. Risk Assessment and Mapping

This section of the WMP requires the filer to discuss the risk assessment and mapping initiatives implemented to minimize the risk of its equipment causing wildfires. Filers must describe initiatives related to maps and modelling of: overall wildfire risk, ignition probability, wildfire consequence, risk-reduction impact, match-drop simulations, and climate/weather driven risks. This section also requires the electrical corporation to provide data on spending, miles of infrastructure treated, spend per treated line mile, ignition probability drivers targeted, projected risk reduction achieved from implementing the initiative, risk spend efficiency, and other (i.e., non-ignition) risk drivers addressed by the initiative.

The parameters of risk assessment and resource allocation to reduce wildfire risk derive from the S-MAP and RAMP for GRCs. The risk assessment methodology that governs the three large electrical corporations was determined via a joint Settlement Agreement (Settlement) among parties and approved in D.18-12-014. The process is being refined with each new RAMP/GRC cycle. At present, SDG&E is the next utility in line to file a RAMP for its GRC.

The S-MAP/RAMP RSE methodology applies to all identified safety risks, not just wildfires, although utility-caused wildfires are considered the top safety risk for each of the electric distribution utilities and therefore a big component of the risk assessment program. The WMP is an opportunity to put the S-MAP/RAMP process into practice for all covered utilities.

Each large electrical corporation is at a different stage in using the Settlement methodology approved in D.18-12-014. Going forward each is must employ uniform processes and scoring methods to assess current risk, estimate risk reduction attributable to its proposed mitigations, and establish a risk-spend efficiency score for each mitigation by dividing the risk reduction by the total cost of the mitigation program.

RSE is a tool to allocate resources toward actions that offer the greatest risk reduction per dollar spent. In accordance with the Settlement, electrical corporations are required to conduct this analysis at the asset level to compare effectiveness of certain mitigations to alternatives.

SDG&E's risk assessment and mapping plans consist of a primarily automated risk assessment and mapping methodology referred to as its Wildfire Risk Reduction Model (WRRM), which includes a version focused on long term planning and a second, operational version (WRRM-Ops), focused on supporting emergency activities. SDG&E's WRRM incorporates a large amount (more than two terabytes) of data and resulting risk factors to provide climate- and weather-driven risk, ignition probability, risk-reduction, and wildfire consequence mapping and modelling capabilities. However, the WMP does not adequately address how SDG&E factors its modeling into decision-making, nor whether and how it updates its models based on lessons learned.

Deficiencies and Conditions – Risk assessment and mapping

Deficiency (SDGE-3, Class B): SDG&E fails to explain how it plans to incorporate lessons learned into updates of its risk models.

In Section 5.3.1.1 of its WMP, SDG&E fails to explain how it plans to incorporate lessons learned into updates of its risk models. For instance, the model does not currently factor in spot fires or emergency resources.[6]

Condition (SDGE-3, Class B): In its first quarterly report, SDG&E shall describe:

i) how it plans to incorporate learnings into its risk models, including a specific implementation timeline;

[6] *See* SDG&E response to WSD data request SDGE-43895-C-330.

ii) changes or updates to its risk models identified after 2020 WMP submission; and

iii) the status of implementing the changes and updates identified in (ii) above, including the expected timeframe for completion.

6.5.2. Situational Awareness and Forecasting

The situational awareness and forecasting section of the WMP requires the filer to discuss its use of cameras, weather stations, weather forecasting and modeling tools, grid monitoring sensors, fault indicators, and equipment monitoring. Situational awareness requires the electrical corporation to be aware of actual ignitions in real time, and to understand the likelihood of utility ignitions based on grid and asset conditions, wind, fuel conditions, temperature and other factors.

The WMP Guidelines refer to key situational awareness measures, including:

1) Installation of advanced weather monitoring and weather stations that collect data on weather conditions to develop weather forecasts and predict where ignition and wildfire spread is likely,
2) Installation of high definition cameras throughout an electrical corporation's service territory, with the ability to control the camera's direction and magnification remotely,
3) Use of continuous monitoring sensors that can provide near real-time information on grid conditions,
4) Use of a fire risk or fire potential index that takes numerous data points in given weather conditions and predicts the likelihood of wildfire, and
5) Use of personnel to physically monitor areas of electric lines and equipment in elevated fire risk conditions.

Generally speaking, SDG&E is leading California electrical corporations with respect to gathering and processing data relating to weather for situational awareness. SDG&E's situational awareness plans consist of extensive camera,

weather monitoring and wireless fault indicator systems; development and further refinement of its FPI, along with a Santa Ana Wildfire Threat Index (SAWTI); and use of field personnel based on system conditions, weather, and wildfire potential. SDG&E shares its FPI-based forecasts daily with local fire agencies, emergency responders, and the National Weather Service. SDG&E's WMP also discusses ongoing development of a circuit risk index, which should enhance decision-making for isolating specific points for future PSPS events. However, the WMP does not adequately address how it utilizes its FPI nor incorporates the outputs of its FPI into protocols and procedures.

Additionally, SDG&E's WMP does not adequately explain or identify what mitigations it takes or plans to take with respect to early fault detection. While fault indicators are helpful with respect to locating faults when they occur, they do not help prevent faults from occurring in the first place. SDG&E also states it has not identified a risk-mitigating application for continuous monitoring sensors.

Deficiencies and Conditions – Situational awareness and forecasting

SDG&E does not adequately explain how it utilizes FPI or incorporates FPI into protocols and procedures. Additionally, SDG&E does not adequately describe how it plans to utilize early fault detection.

Deficiencies such as these are not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

6.5.3. Grid Design and System Hardening

The grid design and system hardening section of the WMPs examine how the filer is designing its system and what it is doing to strengthen its distribution and transmission system and substations to prevent catastrophic wildfire. The grid design and system hardening WMP section also requires discussion of routine and non-routine maintenance programs, including whether the filer replaces or upgrades infrastructure proactively rather than running facilities to failure. Programs in this category, which often cover the most expensive aspects of a WMP, include initiatives such as the installation of covered conductors to replace bare overhead wires, undergrounding of distribution or transmission lines, and

pole replacement programs. The filer is required, at a minimum, to discuss grid design and system hardening in each of the following areas:

1) Capacitor maintenance and replacement,
2) Circuit breaker maintenance and installation to de-energize lines upon detecting a fault,
3) Covered conductor installation,
4) Covered conductor maintenance,
5) Crossarm maintenance, repair, and replacement,
6) Distribution pole replacement and reinforcement, including with composite poles,
7) Expulsion fuse replacement,
8) Grid topology improvements to mitigate or reduce PSPS events,
9) Installation of system automation equipment,
10) Maintenance, repair, and replacement of connectors, including hotline clamps,
11) Mitigation of impact on customers and other residents affected during PSPS event,
12) Other corrective action,
13) Pole loading infrastructure hardening and replacement program based on pole loading assessment program,
14) Transformers maintenance and replacement,
15) Transmission tower maintenance and replacement,
16) Undergrounding of electric lines and/or equipment,
17) Updates to grid topology to minimize risk of ignition in HFTDs, and
18) Other/not listed items if an initiative cannot feasibly be classified within those listed above.

SDG&E will introduce Supervisory Control And Data Acquisition (SCADA) capacitors (30 each in 2020 and 2021 and 40 in 2022[7]) to increase situational awareness during extreme weather conditions and monitor ignition data. SDG&E prioritizes distribution equipment replacement projects according to its WMP prioritization and resource allocation process and utilizes Quality Assurance (QA)/Quality Control (QC) to audit the quality of the installations.

SDG&E plans to use advanced protection devices including microprocessor relays—designed to trip a circuit breaker—with synchro Phasor Measurement Units (PMUs) to measure power quality; automation controllers; line monitors to enable the use of fault protection; and fault detection devices. SDG&E prioritizes distribution equipment replacement projects according to its WMP prioritization and resource allocation process and utilizes QA/QC to audit the quality of the installation.

Many of SDG&E's equipment repair and replacement activities are embedded in its regular operations and maintenance processes. Distribution pole replacement is subject to SDG&E's WMP prioritization and resource allocation process. Replaced poles are audited by SDG&E's Civil/Structural Engineering Department. SDG&E plans to replace 2,010 poles in the HFTD over the next three years.[8]

According to SDG&E there are approximately 11,000 expulsion fuses in its service territory. In 2019, SDG&E replaced these fuses with 2,000 California Department of Forestry and Fire Protection (CAL FIRE)-approved power fuses in the HFTD and plans to replace 3,000 fuses in 2020. Similar to other grid resiliency measures, SDG&E is using a risk prioritization and QA/QC methodology to select the location and audit installed fuses.[9]

SDG&E states it will use WMP prioritization and resource allocation processes to identify if, where and how each of these proposed options will be pursued. Over the next three years, SDG&E will install 30 switches to enable grid sectionalizing

[7] SDG&E Revised WMP updated March 2, 2010, at 69.

[8] *Id.* at 75.

[9] *Id.* at 76.

to mitigate PSPS impacts.[10] With respect to microgrids, SDG&E will examine its ability to serve critical facilities, the amount of undergrounding required, load profiles, and technology solution, i.e. solar, solar + storage, etc. They will also consider grid topology issues, such as whether a community is not in a high-risk PSPS area but receives power from lines that are within a high risk area or whether concentrated critical facilities could potentially remain powered by a microgrid. SDG&E has developed three microgrid projects and has proposed additional projects in the Microgrid rulemaking proceeding. SDG&E has instituted a generator grant program administered by a third-party to medical baseline customers and provides communities with community resource centers during PSPS events. The expanded grant program is intended to be utilized by customers to fund portable generators. SDG&E plans to fund 400 mobile generators and whole house generators in rural communities where the cost of hardening is high from 2020-22.[11]

SDG&E is deploying a privately-owned, Long-Term Evolution (LTE) network to enhance SDG&E's communication network to enable fire prevention and public safety programs.

SDG&E's WMP states it has formed a PSPS mitigation engineering team that will assess and prioritize specific mitigations based on segment-by-segment analysis of circuits prone to PSPS. SDG&E also plans to pilot the use of covered conductor in 2020 and expects the number of circuit miles with covered conductor to increase in 2020 and 2021. The WSD expects specific and detailed data on the results of its segment-by-segment analysis and its covered conductor pilot in future WMPs to enable the Commission to validate the effectiveness of SDG&E's prioritization and resource allocation methods.

SDG&E's WMP does not adequately identify or describe the details of its more costly planned investments or of its decision-making process with respect to its various planned initiatives. Although SDG&E's WMP states that it uses prioritization methods and resource allocation processes to identify if, where and how each of these measures should be pursued, the WMP does not provide an adequate description of those methods and processes nor how specifically they

[10] *Id.* at 77.

[11] *Id.* at 84.

lead SDG&E to identify which measures to pursue, where to pursue them, and in what order to pursue them. Such detail is particularly important for significant investments, i.e., additional overhead distribution facilities and undergrounding, in order to evaluate whether SDG&E is pursuing these very costly mitigations in the most efficient manner.

Deficiencies and Conditions – Grid design and system hardening

Deficiency (SDGE-4, Class B): SDG&E does not provide sufficient detail on strategic undergrounding pilots.

In addressing its undergrounding efforts, SDG&E states it will determine a need to strategically underground lines through pilots that establish a baseline for project scope, cost and schedule, but does not provide sufficient detail on how it will report and share its findings.

Condition (SDGE-4, Class B): In its first quarterly report, SDG&E shall:

i) detail its plans to report and share the findings of its undergrounding pilot initiatives;

ii) outline what data it plans to collect and report for project scope, cost and schedule of these projects, and

iii) explain how it intends to track and measure the effectiveness of these projects in comparison to other WMP initiatives.

Deficiency (SDGE-5, Class B): SDG&E does not provide sufficient detail on need for regulatory assistance.

SDG&E acknowledges potential easement and line extension barriers (from main road to house) related to undergrounding efforts, and requests regulatory assistance to alleviate barriers. However, SDG&E does not provide specific detail regarding the type of regulatory assistance needed, the required timeframe for such actions, or its plans for obtaining the needed assistance from regulators.

Condition (SDGE-5, Class B): In its first quarterly report, SDG&E shall:

i) list and describe all regulatory barriers to implementation of its undergrounding initiatives,

ii) detail its proposals for specific regulatory changes needed to eliminate the barriers identified in (i) above; and

iii) describe its efforts and actions over the past 3 years to collaborate with regulators and other entities responsible for implementing the regulatory changes identified in (ii) above, including status and expected timeline for implementation.

Deficiency (SDGE-6, Class B): SDG&E does not provide sufficient detail on plans for reinforcing transmission lines.

SDG&E's WMP lacks sufficient detail to demonstrate the efficacy of its plans for reinforcing transmission lines – to have at least one hardened line into every transmission substation in the HFTD by 2020 and to harden 66 miles within a three-year period.[12]

Condition (SDGE-6, Class B): In its first quarterly report, SDG&E shall:

i) detail how it plans to measure and report the efficacy of its plans to reinforce transmission lines and, specifically, to have at least one hardened line into every transmission substation in the HFTD by 2020 and to harden 66 miles within the three-year plan period;

ii) list and describe the specific actions and initiatives it plans to implement to achieve this plan for its transmission lines; and

iii) the status and timeline for completion of all actions and initiatives identified in (ii) above.

6.5.4. Asset Management and Inspections

The asset management and inspections portion of the WMP Guidelines requires the filer to discuss power line/infrastructure inspections for distribution and

[12] *Id.* at 88.

transmission assets within the HFTD, including infrared, LiDAR, substation, patrol, and detailed inspections, designed to minimize the risk of its facilities or equipment causing wildfires. The filer must describe its protocols relating to maintenance of any electric lines or equipment that could, directly or indirectly, relate to wildfire ignition. The filer must also describe how it ensures inspections are done properly through a program of quality control.

SDG&E's asset management and inspection plans consist of mandated maintenance and inspection programs,[13] annual patrol inspections of every distribution facility; and detailed overhead visual inspections of HFTD Tier 3 areas on a three-year cycle. SDG&E has begun piloting a Circuit Ownership program, by which field employees submit circuit vulnerabilities so that such vulnerabilities can be timely repaired and prevent a potential ignition; a program dashboard enables oversight and tracking of issues, and should enable assessment of the effectiveness of this pilot. SDG&E plans to pilot periodic infrared inspections to identify "hot" connections that have the potential to cause wire downs and ignitions upon failure; and drone inspections to obtain zoomed-in photos of connectors and hardware. SDG&E considers that LiDAR be used in the context of engineering and design, but not for inspections of facilities.

However, the WMP does not adequately describe the details of its risk assessment process, or whether and how it considers alternatives to identified risk-reduction initiatives. SDG&E's determination to conduct annual patrol inspections of every distribution facility, and detailed overhead visual inspections of HFTD Tier 3 areas every three years, suggest that it considers wildfire risks to determine how often and where to focus its inspection efforts, but does not identify or describe the specific risk(s) it intends to mitigate with each type of inspection. Also, as a proportion of its overall expenditures (from 2020 to 2022), SDG&E plans to spend more than twice as much as PG&E or SCE on asset management and inspections; a large portion of these planned expenditures are for drone inspections. Consideration of alternatives is not

[13] Relevant maintenance and inspection mandates include: General Order (GO) 165 (inspection cycles for electric distribution facilities), GO 128 (underground electric supply systems construction and maintenance), GO 95 (overhead electric line construction and maintenance), GO 174 (substation system inspection and maintenance); and Public Resources Code Sections 4292 and 4293 (minimum clearances around utility poles).

apparent from SDG&E's WMP. Similarly, although the general description of factors SDG&E considers when determining asset replacements is valuable, the WMP lacks a detailed breakdown of the factors contributing to its specific planned additions.

Appendix B, Figure 2.1a represents a breakdown of utility inspection findings per circuit mile and delineates the findings in accordance to the priority levels defined in GO 95, Rule 18. In accordance with Rule 18, priority Level 1 findings are those that pose "an immediate risk of high potential impact to safety or reliability." Priority Level 2 findings are any non-immediate "risk[s] of at least moderate potential impact to safety or reliability…" GO 95, Rule 18 considers priority Level 3 findings as, "any risk of low potential impact to safety or reliability." Pursuant to Rule 18, each priority level corresponds to a maximum timeframe for corrective action (*i.e.* to fix the identified GO 95 violation or safety hazard).

As shown in Appendix B, Figure 2.1a, SDG&E's reported inspection findings remained relatively constant from 2015 through 2019. Because SDG&E corrects all inspection findings within the timeframe corresponding to Level 2 findings, SDG&E reports no Level 3 findings. In 2019, 96% of SDG&E's inspection findings were priority Level 2 (compared to 64% for SCE and only 6% for PG&E).

Deficiencies and Conditions – Asset management and inspections

SDG&E does not provide adequate details of its risk assessment process and how it considers alternatives to identify the most effective risk-reduction initiative, nor does SDG&E identify and describe the specific risk(s) it intends to mitigate with each type of inspection.

This deficiency is not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

6.5.5. Vegetation Management and Inspections

This section of the WMP Guidelines requires filers to discuss vegetation inspections, including inspections that go beyond existing regulation, as well as infrared, LiDAR, and patrol inspections of vegetation around distribution and transmission lines/equipment, quality control of those inspections, and limitations on the availability of workers. The filer must also discuss

collaborative efforts with local land managers to leverage opportunities for fuel treatment activities and fire break creation, methodology for identifying at-risk vegetation, how trim clearances beyond minimum regulations are determined, and how the filer considers and addresses environmental and community impacts related to tree trimming and removal (erosion, flooding, and the like).

SDG&E's vegetation management and inspection programs consist of tracking and maintaining a database of trees and poles that are located close to electric infrastructure; regular patrolling, pruning, and identifying and removing hazardous trees and replacing with the right tree at the right place; pole maintenance with pole brushing and clearing; training first responders in electrical and fire awareness; and red flag operations. SDG&E describes its enhanced vegetation management as (1) conducting a second hazard tree inspection activity throughout the entire HFTD to coincide with post-trim audit activity; (2) removing hazard trees with strike potential; and (3) extending the clearance area around lines from 12 feet to 25 feet at the time of trim. SDG&E states that trees with strike potential are inspected and those identified as hazard trees are mitigated. SDG&E also identifies target species for removal and offers a program to replace trees under right tree-right place criteria. Although this process appears somewhat effective, it still allows trees to become a hazard before being mitigated. Trees with strike potential that do not meet the hazard criteria can still fail and contact the lines and cause ignitions.

There are several areas of concern in SDG&E's 2020 vegetation management proposals. We describe each below and prescribe conditions with which SDG&E is required to comply.

Deficiencies and Conditions – vegetation management

Although the adequacy of staff resources appears less of a concern than for the other large electrical corporations, SDG&E's WMP does not detail its recruitment and training efforts for vegetation management personnel. All utilities have experienced some level of difficulty finding sufficient numbers of experienced personnel, particularly in vegetation management. Utilities describe a competitive environment that makes recruiting talent difficult. However, utilities do not explain in detail the range of activities that they are undertaking to recruit and train personnel to grow the overall pool of talent.

This deficiency is not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

Deficiency (SDGE-7, Class B): Potential redundancies in vegetation management activities.

The scope and magnitude of its vegetation management activities raised concerns about potential redundancies. SDG&E seems to provide potentially redundant programs and measures, and greater evaluation of its "Master Schedule" as mentioned throughout Section 5.3.5 was needed. The Master Schedule, supplied in response to a WSD data request, only displays the schedule for routine vegetation inspections and work.

Condition (SDGE-7, Class B): In its first quarterly report, SDG&E shall:

i) Describe how it assesses its vegetation management processes to determine effectiveness; and

ii) Provide additional evaluation on how inspections overlap with one another both in timing and scope, including evaluation of effectiveness in terms of number and quality of findings per inspection. For example, if not many findings are being made, then SDG&E should provide an assessment of whether additional efforts are necessary.

Deficiency (SDGE-8, Class B): Consideration of environmental impacts, local community input.

SDG&E does not provide sufficient detail regarding how it measures and accounts for the potential environmental impacts related to its vegetation management work or how it incorporates input from local stakeholders in planning and executing its vegetation management work.

Condition (SDGE-8, Class B): In its first quarterly report, SDG&E shall describe:

i) how it measures and accounts for the potential environmental impacts related to its vegetation management work; and

ii) how it incorporates input from local stakeholders in planning and executing its vegetation management work.

Deficiency (SDGE-9, Class B): SDG&E does not explain how investments in undergrounding reduce planned vegetation management spend.

SDG&E indicates in its WMP plans for significant investment in undergrounding. We anticipate that increased underground infrastructure will result in cost savings from reduced or eliminated need for vegetation management for underground infrastructure. However, SDG&E's WMP reports no changes in vegetation management costs over the plan period (i.e. 2020-2022) and lacks detail on how its planned investment in undergrounding initiatives correlates to cost savings in other initiatives, such as vegetation management.

Condition (SDGE-9, Class B): In its first quarterly report, SDG&E shall describe:

i) whether and how it takes ancillary cost savings into account when evaluating the effectiveness of undergrounding initiatives; and

ii) how SDG&E plans to account for realized cost savings through a reduced need for certain vegetation management activities, resulting from its undergrounding investments.

Deficiency (SDGE-10, Class C): Use of outside entities for fuel reduction.

SDG&E's fuel reduction plans are still in an elementary phase. Scrutiny on the effectiveness of using grants and outside entities to perform such work is needed to determine if this effort is more or less effective than having SDG&E staff perform the work themselves, or if this measure alleviates critical resource constraints.

Condition (SDGE-10, Class C): In its annual update, SDG&E shall detail:

i) whether fuel reduction projects via outside entities are being completed; and

ii) how they tie into the overall vegetation management program in terms of effectiveness.

Deficiency (SDGE11, Class B): Lack of detail on veg. mgmt. around substations.

In Section 5.3.5, SDG&E's WMP lacks detail regarding its vegetation management efforts for substations beyond maintaining conductor clearance.

Condition (SDGE-11, Class B): In its first quarterly report, SDG&E shall:

i) describe how it plans fuels reduction work around its substations; and

ii) whether and how it maintains defensible space around its substations.

Deficiency (SDGE-12, Class B): Details of quality assurance, quality control.

SDG&E's WMP describes a quality assurance and quality control efforts designed to evaluate and ensure the effectiveness of its vegetation management and inspection activities. However, SDG&E's WMP lacks sufficient detail regarding how these quality assurance and quality control efforts measure and evaluate the effectiveness of vegetation management and inspection activities.

Condition (SDGE-12, Class B): In its first quarterly report, SDG&E shall:

i) describe the process and measures for how its quality assurance and quality control (QA/QC) efforts evaluate the effectiveness of vegetation management and inspection activities;

ii) list and describe all QA/QC audits performed, the timing of the audits, and the quantitative results of such audits; and

iii) list and describe all changes implemented as a result of QA/QC audit findings.

Deficiency (SDGE-13, Class A): Lack of risk reduction or other supporting data for increased time-of-trim clearances.

Throughout its WMP, SDG&E expresses an intent to obtain greater clearances than those required or recommended by the Commission. As these vegetation management programs continue to grow in scope, detailed discussion or

evidence of the effect of these increased vegetation clearances on utility ignitions remains lacking. Specifically, SDG&E does not detail proposed guidelines for where such a clearance is both feasible and necessary, or scientific evidence or other data showing that such clearance will reduce wildfire risk, as directed in our decision approving SDG&E's 2019 WMP.[14] Further details were provided to the WSD in response to a data request, specifically that SDG&E performs a tree-by-tree analysis with particular concern for "at-risk species" to determine if a 25-foot clearance is beneficial.

SDG&E's WMP does not provide results or analysis of the effectiveness of this measure since implementation of its 2019 WMP, as required by D.19-05-039. Without the ability to understand or even observe an incremental benefit of this increased clearance, it will be difficult to determine the effectiveness of this measure.

Condition (SDGE-13, Class A): SDG&E shall submit an RCP with a plan for the following:

i. Comparing areas with and without enhanced post-trim clearances to measure the extent to which post-trim clearance distances affect probability of vegetation caused ignitions and outages.

ii. Collaborating with PG&E and SCE in accordance with Conditions PG&E-26 and SCE-12 to develop a consensus methodology for how to measure post-trim vegetation clearance distance impacts on the probability of vegetation caused ignitions and outages.

Deficiency (SDGE-14, Class B): Granularity of "at-risk species". SDG&E identifies five types of "at-risk" trees - eucalyptus, palm, oak, pine, and sycamore.

[14] D.19-05-039, at 10: "In SDG&E's next WMP, it shall propose, in detail, guidelines for where a 25-foot post-trim clearance for vegetation management is both feasible and necessary. If SDG&E plans to create a 25-foot clearance during this WMP cycle, it may only do so if such a practice is supported by scientific evidence or other data showing that such clearance will reduce risk under wildfire conditions.; and Ordering Paragraphs 5 and 6.

However, SDG&E identifies these trees by their genus, and based on additional review, the WSD has discovered that not all tree species within a genus are considered "at-risk" trees. As such, SDG&E's WMP lacks sufficient detail to identify the tree species it considers "at-risk" and subject to its enhanced vegetation management programs.

Condition (SDGE-14, Class B): In its first quarterly report, SDG&E shall detail the following:

i) all tree species within the genera identified in its list of "at-risk" trees;

ii) the measures, properties and characteristics it considers in identifying "at-risk" trees; and

iii) the threshold values of the measures, properties and characteristics identified in (ii) above that result in a species being defined as "at-risk."

6.5.6. Grid Operations and Operating Protocols, Including PSPS

The grid operations and operating protocols section of the WMP requires discussion of ways the filer operates its system to reduce wildfire risk and the potential scope and scale of PSPS events. For example, disabling the reclosing function of reclosers[15] during periods of high fire danger (e.g., during RFW conditions) can reduce utility ignition potential by minimizing the duration and amount of energy released when there is a fault. This section also requires discussion of work procedures in elevated fire risk conditions, PSPS events and protocols, and whether the filer has secured on-call ignition prevention and suppression resources and services.

SDG&E has fully deployed SCADA-controlled reclosers on its distribution system; each recloser is tied into specific wind anemometer locations, allowing

[15] A recloser is a high voltage circuit breaker that detects and interrupts momentary fault conditions on the grid. The device can reclose automatically and reopen if a fault condition is still detected. However, if a recloser closes a circuit that poses the risk of ignition, wildfire may be the result. For that reason, reclosers are disabled in certain high fire risk conditions. During overcurrent situations, circuit breakers trip a switch that shuts off power to the electrical line.

for targeted applications of PSPS to the areas that pose the most significant real-time risk of wildfire. During periods of elevated wildfire risk conditions, all distribution reclosing functions are disabled on circuits located within the HFTD but may include other circuits if the burn environment is conducive to large wildfires. SDG&E has also developed the ability to enable more sensitive relay settings on overhead distribution reclosers. The relay settings improve sensitivity of fault detection and the speed at which faults are cleared. These reclosing protocols are validated annually prior to the start of fire season.

SDG&E uses Wildfire Infrastructure Protection Teams consisting of contractors for wildfire prevention and ignition mitigation services, which is paired with SDG&E personnel during times of elevated wildfire potential. Contractor teams include two qualified firefighters, firefighting equipment and 300 gallons of water. These teams are intended to prevent an ignition from work being performed and other heat sources that exist on a construction site. In 2019, SDG&E increased the number of teams to eight. Plans are to expand the program depending on the volume of work in fire prone portions of their serviced territory.

SDG&E monitors environmental conditions throughout the year, designated as 1) Normal, 2) Elevated Condition, or 3) Extreme or RFW Conditions. These designations define specific operating procedures and guidelines tailored to the severity of environmental conditions.

In 2019, SDG&E formalized its process of reviewing all wildfire procedures with a new position, Training and Plan Enhancement Fire Coordinator. SDG&E intends to provide training on procedures in conditions of elevated fire risk.

SDG&E provided information in a narrative form on the current processes, i.e. FPI and Vegetation Management Index; organizational structure, i.e. cross - function team of engineers, meteorologists and risk managers; and personnel training and guidelines, and planned improvements, i.e. the cross functional team will conduct further analysis to assess SDG&E asset risk due to wildfires.

SDG&E has on-site and on-call resources and services to utilize during a wildfire event. This includes a year-round aviation firefighting program, regarding which SDG&E notes that state firefighting resources are often diverted to fight fires north of its service territory, and an industrial fire brigade contractor with

specialized training with electric fires. These resources are stationed at facilities near the center of SDG&E's service territory.

Appendix B, Figure 1.5a shows the total annual RFW circuit mile days for each reporting year. This figure is used as a proxy for differentiating fire weather potential—as a function of RFWs—year over year for each electrical corporation. Appendix B, Figure 2.8a displays annual customer hours of PSPS events normalized across the WMP-defined metric of RFW Circuit Mile Days. Normalizing accounts for varying fire weather conditions using a common metric of RFWs. Further study and refinement is necessary, as there are inconsistencies in how the electrical corporations calculate this value. The following analysis discusses both normalized and total values for PSPS customer hours.[16]

While SDG&E began implementing PSPS back in 2013, SDG&E reports that it did not initiate any PSPS events in 2015 and 2016. However, since 2017, SDG&E's total customer hours of outages associated with PSPS has increased nearly 35% annually. During this same period (2017-2019), as the duration of SDG&E PSPS outages increased, in accordance with the figure in Appendix B, Figure 1.5a, the RFW circuit mile days in its territory steadily decreased over 30% annually, on average. Interestingly, while SDG&E's reported RFW circuit mile days in 2019 are approximately equal to 2016 values (3% more in 2019), there were no PSPS events initiated in 2016 compared to more than 1.3 million customer hours of PSPS related outages in 2019. Even SDG&E, who has the most mature PSPS program of the large electrical corporations and is regarded as an industry leader in wildfire mitigation, has reported an average annual increase of nearly 110% in PSPS customer hours when normalized for RFW circuit mile days, signaling the increased reliance on PSPS as a mitigation measure. As discussed in Section 4, SDG&E suggests this increase is a direct result of it incorporating its 95th and 99th percentile wind variation data as a criterion for calling a PSPS event.

Although SDG&E is clearly focused on mitigating the impact of future PSPS events and describes an expansive PSPS outreach strategy, the WMP does not adequately describe other areas crucial to an overall PSPS mitigation strategy. In particular, it does not describe SDG&E's protocols for re-energization after a

[16] Total customer hours of PSPS obtained from appear in SDG&E's WMP Table 12.

PSPS event, beyond a general statement that it conducts patrols and corrects any issues such as clearing debris or repairing damaged equipment prior to re-energization.

Deficiencies and Conditions – Grid Operations and Operating Protocols, including PSPS

SDG&E does not provide adequate detail on its strategy to reduce scale and scope of PSPS nor protocols for re-energization after a PSPS event.

This deficiency is not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

6.5.7. Data Governance

The data governance section of the WMP Guidelines seeks information on the filer's initiatives to create a centralized wildfire-related data repository, conduct collaborative research on utility ignition and wildfire, document and share wildfire-related data and algorithms, and track and analyze near miss data.

SDG&E's data governance plans consist of developing two types of centralized data repositories. One is for asset data management, aimed at consolidating data to track the condition of assets and using predictive analysis to identify likelihood of failure. SDG&E states it will be using this information to inform its risk management strategies. The other centralized data repository is a GIS platform aimed at sharing PSPS data with state agencies and was developed to support emergency preparedness efforts. SDG&E's WMP also describes its collaborative efforts with academia, government and community members to develop and share its data tools and algorithms; SDG&E plans to establish a Fire Science and Innovation Lab in 2020 to continue collaborative research and problem-solving for preventing ignitions, mitigating fires and building resiliency. SDG&E also plans to continue developing its Ignition Management Program, for analysis of near ignition events, and will integrate the outputs of this analysis into its WMP metrics, operational and system hardening initiatives. However, the WMP does not adequately address whether and how SDG&E will centralize other related datasets (e.g., ignition, outage, near miss data) with its asset condition data.

Deficiencies and Conditions – Data Governance

Deficiency (SDGE-15, Class B): Details of centralized data repository. SDG&E indicates efforts to create a centralized data repository, however, its WMP lacks sufficient detail of the data to be included.

Condition (SDGE-15, Class B): In its first quarterly report, SDG&E shall:

i) list and describe all data it plans to provide in its centralized repository;

ii) list and describe the sources and treatment of all data identified in (i) above; and

iii) describe the frequency it plans to update all data identified in (i) above.

6.5.8. Resource Allocation Methodology

The resource allocation section of the WMPs requires the filer to describe its methodology for prioritizing programs to minimize the risk of its equipment or facilities causing wildfires in the most cost-efficient manner. This section requires filers to discuss risk reduction scenario analysis and provide a risk spend efficiency analysis for each aspect of the plan.

SDG&E's resource allocation plans consist of a resource allocation methodology and system that conforms with ISO 55000;[17] development of an enterprise-wide, multi-attribute value framework for evaluating capital investments; and risk spend efficiency calculations for most but not all of its wildfire mitigation activities.

However, the WMP does not adequately address the details of its resource allocation process. For example, while SDG&E outlines numerous efforts to improve its ability to more effectively conduct PSPS and minimize its impacts, there is a clear gap and absence of detail on the relationship between various hardening, vegetation management, and asset management initiatives and corresponding impacts on thresholds for initiating PSPS events. Also, while SDG&E describes its resource allocation methodology in narrative, it does not provide spending data, as this planning and risk function is part of its utility

[17] ISO 55000 is an international standard for establishment, implementation, maintenance, and improvement of an asset management system.

capital planning process. Similarly, in terms of risk assessment, SDG&E's WMP simply refers to its RAMP and to Section 5.4 of its WMP, which is not specific to wildfire reductions, rather than provide information responsive to the WMP Guidelines.

Appendix B, Figure 3.1a shows the total planned spend for each utility during the plan period (2020-2022). The planned spend is also presented as normalized values – normalized over circuit miles and HFTD circuit miles. Considering that much of the planned spend will occur in HFTD areas, the HFTD circuit mile normalization is focused on in this analysis. However, utility-provided information was used to populate Appendix B, Figure 3.1a and there are errors in utility calculations for spend totals, as well as inconsistent interpretations on what data to report (i.e., overhead vs. total miles, transmission vs. distribution, and other) for circuit mileage.

As shown in Appendix B, Figure 3.1a, when assessing planned spend per circuit mile in HFTD, large electrical corporations are roughly planning to spend similar amounts. On average, the large electrical corporations plan to spend $305K per HFTD circuit mile.

SDG&E's planned spend per HFTD circuit mile, approximately $291 thousand, is at the low end of the large electrical corporations and is approximately 4.5% less than the average of PG&E, SCE and its planned spending.

Appendix B, Figures 3.2a and 3.3a show the same information – planned spend by category for the plan period – in different formats. The planned spend is normalized by HFTD circuit miles. Utility-provided information was used to populate the information in Appendix B, Figures 3.2a and 3.3a and there are errors in utility calculations for spend totals, as well as inconsistent interpretations on what data to report, such as overhead vs. total miles and transmission vs. distribution, for circuit mileage.

As shown in Appendix B, Figures 3.2a and 3.3a, over 90% of all large electrical corporations' planned spending is allocated to the following four categories: (1) grid design and system hardening, (2) vegetation management and inspections, (3) asset management and inspections, and (4) grid operations and protocols (mostly PSPS). On average, the large electrical corporations plan to allocate

approximately 93% of their planned spend on initiatives across these four WMP categories. All large electrical corporations plan to spend more than half their total budget on grid design and system hardening initiatives and approximately 5% of their budget on other enabling initiatives (e.g., situational awareness and risk assessment and mapping).

In comparing planned spend allocation to PG&E and SCE across the four categories identified above, SDG&E plans to allocate twice the percentage of its budget to asset management and inspection initiatives, despite having more underground circuit miles, as a percentage of total circuit miles, compared to PG&E and SCE.

Appendix B, Figure 3.6a lists the top five initiatives by planned spend for SDG&E. It is important to recall that these are individual initiatives and do not comprise the full suite of activities within each category. Appendix B, Figure 3.6b lists the top three initiatives within each of the top four categories. The top initiatives by planned spend are only shown for the top four spend categories because less than 10% of planned spend is attributed to the other six WMP categories.

Appendix B, Figure 3.6a shows that SDG&E allocates nearly 30% of its total planned budget on undergrounding. This is especially noteworthy when considering that compared to PG&E and SCE, SDG&E currently has the largest share of its total system underground, yet it plans to allocate significantly more resources (as a fraction of total expenditures) on more undergrounding. This undergrounding work is planned to ramp up over the plan period with an average annual spend of approximately $125 million – about 25 times more than SDG&E spent on undergrounding as part of its 2019 WMP ($5 million). Interestingly, as SDG&E plans to ramp up undergrounding efforts during the plan period, it plans on significantly decreasing its spending on hardening of overhead distribution lines during that same time. Also noteworthy is the fact that SDG&E plans to allocate nearly 10% of its total planned spend during the WMP period on installation of an LTE communication network to support its vast deployment of automated sensory devices and SCADA enabled equipment. SDG&E is the only electrical corporation planning to allocate such a significant portion of its spending on development of high-speed communication network.

SDG&E indicates this LTE network is intended to mitigate communication gaps in rural areas from external communication providers.

In response to maturity model survey questions regarding capability 14, SDG&E indicates that it projects to have the ability to estimate risk spend efficiencies for hardening initiatives at the circuit level.

Deficiencies and Conditions – Resource allocation methodology

SDG&E does not adequately address the details of its resource allocation process.

This deficiency is not unique to SDG&E. As such, this deficiency and associated condition is addressed in the Guidance Resolution, WSD-002.

6.5.9. Emergency Planning and Preparedness

The WMP Guidelines require a general description of the filer's overall emergency preparedness and response plan, including discussion of how the plan is consistent with legal requirements for customer support before, during and after a wildfire, including support for low income customers, billing adjustments, deposit waivers, extended payment plan, suspension of disconnection and nonpayment fees, and repairs. Filers are also required to describe emergency communications before, during, and after a wildfire in English, Spanish, and other languages required by the Commission.

The WMP Guidelines also require discussion of the filer's plans for coordination with first responders and other public safety organizations, plans to prepare for and restore service, including workforce mobilization and prepositioning of equipment and employees, and a showing that the filer has an adequate and trained workforce to promptly restore service after a major event.

SDG&E's emergency planning and preparedness plans consist of customer support programs, emergency communications, coordination with public safety partners, and planning/preparation for workforce mobilization under an Incident Command System (ICS) framework designed for service restoration. SDG&E states it is adding personnel for after-action review and PSPS coordination. In total, SDG&E plans to spend approximately $18 million, or one percent of its total planned spending on emergency planning and preparedness.

SDG&E has developed a robust notification and communications program over the years with multiple modes of communication. SDG&E's WMP states its communications protocols are agnostic of the emergency type.

6.5.10. Stakeholder Cooperation and Community Engagement

The final topic covered in Section 5 relates to the extent to which the filer will engage the communities it serves and cooperate and share best practices with community members, industry partners, government and public safety agencies, and others engaged in utility-related wildfire mitigation.

SDG&E's stakeholder cooperation and community engagement consist of community outreach and education before, during and after a wildfire or PSPS, including in-language communications; development of a joint fire prevention plan with local stakeholders; partnering with local emergency response and participation in community preparedness efforts; community resource centers located in or near areas likely to be impacted by PSPS events; and cooperation with suppression agencies. However, the WMP does not adequately address whether and how SDG&E engages in cooperative fuel reduction work.

Deficiencies and Conditions – Stakeholder cooperation and community engagement

Deficiency (SDGE-16, Class B): Details of cooperative fuel reduction work.

A large portion of SDG&E's HFTD area falls within federal lands. As such, it is imperative that SDG&E maintain close coordination and working relationships with the U.S. Forest Service (USFS), who is responsible for managing federal lands. SDG&E identifies specific ways in which it coordinates with the USFS, which appear sufficient for receiving permits for fuel reduction, but SDG&E does not address the resources needed to collaborate on fuel reduction efforts and establish formal agreements.

Condition (SDGE-16, Class B): In its first quarterly report, SDG&E shall describe:

i) whether it plans to collaborate with the USFS on fuel reduction programs in its service territory;

ii) what programs or agreements, if any, it has in place with the USFS for fuel reduction programs;

iii) the timeline for implementing initiatives identified in (i) and (ii);

iv) how it plans to identify the resources needed to collaborate with the USFS on fuel reduction; and

v) the status of reaching any formal agreements on fuel reduction efforts.

7. Maturity evaluation

In 2020, the WSD introduced a new Utility Wildfire Mitigation Maturity Model, to establish a baseline understanding of utilities' current and projected capabilities and assess whether each utility is progressing sufficiently to improve its ability to mitigate wildfire risk effectively. The maturity model also serves as an objective means of comparing across utilities and provides a framework for driving utility progress in wildfire risk mitigation over time. WMP filers were required to complete a survey in which they answered specific questions which assessed their existing and future wildfire mitigation practices across 52 capabilities at the time of filing and at the end of the 3-year plan horizon. The 52 capabilities are mapped to the same 10 categories identified in Section 5 above.[18]

The maturity model will continue to evolve each year to reflect best practices and lessons learned. With the inaugural use of the maturity model in 2020, it is important to note that the resulting maturity score is to be informative of a utility's capabilities within the context of the underlying assessment criteria. Accordingly, it is essential that the maturity assessment scores are understood within the context of the qualitative detail supporting each score. The model results require context and should not be interpreted as the final word on an electrical corporation's wildfire mitigation capabilities without an understanding of the scoring process described in the Guidance Resolution. As such, the final maturity model outputs should be viewed as levels or thresholds – they are not absolute scores.

[18] A detailed description of the purpose and use of the maturity model is provided the Guidance Resolution being issued concurrently with the instant Resolution.

Compared to peer utilities, SDG&E's wildfire mitigation program is currently in a more mature state and SDG&E is focused on development of more advanced capabilities. Despite having a relatively mature wildfire mitigation program, SDG&E plans to advance its capabilities across several categories, including risk assessment and mapping and vegetation management and inspections. For example, in its response to maturity model survey questions regarding capability 22, SDG&E currently determines inspection schedules using a static map but indicates plans to schedule vegetation inspections based on risk by 2023. SDG&E plans to enhance its climate scenario modeling to account for changes in geography, vegetation and extreme weather caused by climate change. SDG&E also plans to increase the confidence interval used in its ignition risk modeling to above 80%, as well as increasing the granularity of its quantitative wildfire and PSPS risk reduction estimates to the circuit-level. Additional advanced capabilities SDG&E plans to grow include enhancing its assessment of wildfire consequence modeling outputs and real-time updates to its weather forecasts with machine learning.

SDG&E's maturity assessment reveals measurable growth in grid design and system hardening capabilities in several forms. This includes taking PSPS into account in its initiative prioritization methodology, determining initiative specific RSE estimates at the circuit-level and independently evaluating the performance and efficacy of new initiatives. When it comes to vegetation inspection and management capabilities, SDG&E currently has a centralized inventory of its vegetation clearances but plans to supplement this inventory with information including tree health and moisture content. SDG&E also indicates plans to schedule vegetation management work based on predictive modeling and leverage models of ignition risk, limb failure and local climate to determine appropriate post-trim clearances.

SDG&E projects growth in its data governance capabilities. SDG&E currently has a centralized database of situational, operational and risk data but plans to supplement this by cataloguing all fire-related data, algorithms, analyses and data processes into a single document and include explanation of sources,

assumptions, and documentation of analyses. Most of SDG&E's projected advancements in resource allocation methodology maturity is found in more granular estimates. By the end of the plan term, SDG&E projects to provide climate-based risk projections, RSE figures for vegetation management and system hardening initiatives and RSE estimates for all its WMP initiatives at the circuit-level. SDG&E's high maturity scores for stakeholder cooperation and community engagement are indicative of a well communicated and executed program that engages stakeholders early in processes and develops strong collaborative partnerships.

A detailed summary of SDG&E's maturity model responses and results is provided in Attachment C.

8. Impact of COVID-19 Pandemic

After SDG&E submitted its WMP, on March 19, 2020, California Governor Gavin Newsom signed Executive Order N-33-20 requiring Californians to stay at home to combat the spread of the COVID-19 virus. Specifically, Governor Newsom required Californians to heed the order of the California State Public Health Officer and the Director of the California Department of Public Health that all individuals living in California stay home or at their place of residence, except as needed to maintain continuity of operation of the federal critical infrastructure sectors, in order to address the public health emergency presented by the COVID-19 disease (stay-at-home order).[19]

As articulated in the March 27, 2020 joint letters[20] of the WSD, CAL FIRE and the California Governor's Office of Emergency Services regarding essential wildfire and PSPS mitigation work during COVID-19 sent to each electrical corporation, electrical corporations are expected to continue to prioritize essential safety work. The WSD expects the electrical corporations to make every effort to keep WMP implementation progress on track, including necessary coordination with

[19] Executive Order N-30-20. Available at http://covid19.ca.gov/img/Executive-Order-N-30-20.pdf.

[20] https://www.cpuc.ca.gov/covid/. Letters to each electrical corporation are found under the heading "Other CPUC Actions", March 27, 2020: Joint Letters to IOUs re: Essential Wildfire and PSPS Mitigation Work.

local jurisdictions. Such effort is essential to ensuring that electrical corporations are prepared for the upcoming and subsequent wildfire seasons, while complying with COVID-19 restrictions requiring residents to shelter-in-place, practice social distancing, and comply with other measures that California's public health officials may recommend or that Governor Newsom or other officials may require in response to the COVID-19 pandemic.

Furthermore, the WSD expects the electrical corporations to continue to make meaningful progress on PSPS mitigation goals, including continuing with sectionalization projects, local outreach and coordination, establishing customer resource centers, and microgrid projects. Electrical corporations are expected to limit planned outage work during this time to wildfire mitigation, PSPS reduction, projects that immediately impact reliability if delayed, and emergency/public safety outages. In addition, electrical corporations are expected to undertake any other critical work related to operating a safe and reliable grid and to mitigate wildfire and/or PSPS risk.

9. Conclusion

- SDG&E's Wildfire Mitigation Plan contains all of the elements required by AB 1054, Pub. Util. Code Section 8386(c) and all the elements required by the WMP Guidelines.
- SDG&E's WMP is approved by the WSD, subject to the conditions set forth in Appendix A.

10. Comments

A draft of this Resolution was served on the service list for R.18-10-007. Comments were allowed under Rule 14.5 of the Commission's Rules of Practice and Procedure. The WSD accepted one set of comments per stakeholder that collectively addressed Draft Resolutions WSD-002 – WSD-009, which represent the totality of the WSD's evaluation of the 2020 WMPs.

The following stakeholders served timely comments on one or more of the WMP Draft Resolutions: Kevin Collins on May 26, 2020; and PG&E, SCE, SDG&E, Bear Valley, California Association of Small and Multi-Jurisdictional Utilities, Horizon

West Transmission, California Environmental Justice Alliance, East Bay Municipal Utility District, Energy Producers and User Coalition, Green Power Institute, Mussey Grade Road Alliance, Protect our Communities Foundation, Public Advocates Office, Catherine Sandoval, County of Santa Cruz, and The Utility Reform Network on May 27, 2020. Additionally, several members of the public submitted input regarding the Draft Resolutions.

In comments to the draft resolution, Protect Our Communities Foundation states the WSD errs in not requiring a remedy for failure to justify 25-foot clearances, as directed by D.19-05-039. Public Advocates Office asserts the WSD has improperly modified D.19-05-039. Arguing against the assertion that it has not complied with D.19-05-039, SDG&E refers to Table 11 of its WMP as indication that a 25-foot post-trim clearance has had a positive impact on wildfire risk for its transmission system, which led it to extend these "enhanced" clearances to the HFTD. SDG&E further explains it is limiting the scope of enhanced clearances to the five highest-risk tree species in the HFTD, approximately 20 percent of trees. Although SDG&E argues that the study called for in Condition SDG&E-13 (prior to modification in the Final Resolution) is "effectively impossible to conduct since such ignitions and outages cannot be simulated," it confirms that it tracks post-trim clearance by tree so it can identify vegetation contacts from a tree with 10-12 foot post-trim clearance separately from vegetation contacts from a tree with 25-foot post-trim clearance.

Although the information provided in SDG&E's comments to the draft resolution provides some insight to the effectiveness and limited scope of this measure, such information should have been included in SDG&E's WMP for examination by stakeholders and the WSD. Therefore, the WSD has modified Condition SDG&E-13 to reflect this deficiency and changed it from Class C to Class A. In addition, the WSD has modified Condition SDG&E-13 to remove the requirement for a study and to provide clarification that SDG&E must collaborate with PG&E and SCE to develop a consensus methodology for how to measure post-trim vegetation clearance distance impacts on the probability of vegetation caused ignitions and outages.

Findings

1. AB 1054 and Commission Resolution WSD-001 require SDG&E to file a WMP for 2020 that conforms with Pub. Util. Code § 8386(c) and guidance provided by the WSD and served on the R.18-10-007 service list on December 16, 2019 by ALJ ruling.

2. The WMPs were reviewed and acted upon with due consideration given to comments received from governmental agencies, the WSAB, members of the public, and all other relevant stakeholders.

3. The WMPs were reviewed and acted upon in compliance with all relevant requirements of state law.

4. SDG&E's WMP contains all the elements required by AB 1054, Pub. Util. Code § 8386(c).

5. SDG&E has satisfied the requirements of Pub. Util. Code § 8386(c) and the WMP Guidelines.

6. Appendix A contains findings regarding deficiencies in SDG&E's WMP.

THEREFORE, IT IS ORDERED THAT:

1. Ratification of the Wildfire Safety Division's approval of San Diego Gas & Electric Company's Wildfire Mitigation Plan is subject to conditions set forth in Appendix A.
2. The Wildfire Safety Division's approval of San Diego Gas & Electric Company's (SDG&E) 2020 Wildfire Mitigation Plan, conditioned upon SDG&E's compliance with the conditions listed in Appendix A, is hereby ratified.
3. San Diego Gas & Electric Company shall submit an update to its Wildfire Mitigation Plan in 2021 according to the forthcoming guidance and schedule issued by the Wildfire Safety Division.
4. San Diego Gas & Electric Company shall submit a new comprehensive 3-year Wildfire Mitigation Plan in 2023.

5. Nothing in this Resolution should be construed as approval of the costs associated with San Diego Gas & Electric Company's Wildfire Mitigation Plan mitigation efforts.
6. San Diego Gas & Electric Company may track the costs associated with its Wildfire Mitigation Plan in a memorandum account, by category of costs, and shall be prepared for Commission review and audit of the accounts at any time.
7. San Diego Gas & Electric Company shall submit a letter to the Wildfire Safety Division containing any updates to scope, timing or other aspects of any mitigation set forth in its Wildfire Mitigation Plan as result of the COVID-19 pandemic, including Public Safety Power Shutoff. The letter shall list items using the same names and sections used in the Wildfire Mitigation Plan and give a thorough description of why the COVID-19 pandemic requires the specified action. The letter shall be submitted within 60 days of issuance of this Resolution and shall be addressed to the Director of the Wildfire Safety Division. The letter shall be emailed to wildfiresafetydivision@cpuc.ca.gov with service on the service list of Rulemaking 18-10-007. If there are no changes to report, no such submission is required.
8. Nothing in this Resolution should be construed as a defense to any enforcement action for a violation of a Commission decision, order, or rule.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on June 11, 2020 the following Commissioners voting favorably thereon:

/s/ ALICE STEBBINS
Alice Stebbins
Executive Director

MARYBEL BATJER
President
LIANE M. RANDOLPH
MARTHA GUZMAN ACEVES
CLIFFORD RECHTSCHAFFEN
GENEVIEVE SHIROMA
Commissioners

APPENDIX A

Deficiencies and Conditions

SDGE-1	SDG&E reports a high number of ignitions related to balloon contact.
Class	B
Deficiency	Although SDG&E has relatively low volume of ignitions (annual average over five-year reporting period of 23, compared to 440 for PG&E and 106 for SCE), over the past five years, SDG&E reports a high percentage (18%) of ignitions related to balloon contact when normalized for overhead circuit miles. Compared to PG&E, SDG&E reports more than three times the rate of such balloon contact ignitions. However, SDG&E's percentage of balloon contact ignitions as a fraction of total ignitions is similar to SCE's, which seems to indicate that this issue is more concentrated in southern California. Considering the fact that SDG&E has substantially less overhead circuitry, as compared to peer utilities, the higher incidence of balloon caused ignitions potentially correlates to an increased risk from this ignition driver in SDG&E's service territory. However, beyond some targeted covered conductor installation and undergrounding and covered conductor initiatives, SDG&E's WMP lacks detail on which initiatives it is implementing to reduce the risk of balloon contact ignitions.
Condition	In its first quarterly report, SDG&E shall: i. list and describe the actions it is taking to study the occurrence and potential consequence of metallic balloon caused ignitions in its service territory; ii. efforts it is taking to mitigate the occurrence of such ignitions in the future; iii. the status of the action and efforts identified in (i) and (ii) above, including timelines for completion; iv. the specific initiatives in its 2020 WMP that aim to reduce the risk of balloon caused ignitions; and v. its goals, targets and quantitative measures for evaluating effectiveness of the initiatives identified in (iv) at reducing the risk of balloon caused ignitions.

SDGE-2	SDG&E reports a high number of ignitions related to vehicle contact.
Class	B
Deficiency	Although SDG&E has relatively low volume of ignitions (annual average over five-year reporting period of 23, compared to 440 for PG&E and 106 for SCE), over the past five years, SDG&E reports approximately twice the rate of ignitions related to vehicle contact compared to PG&E and SCE, when normalized for overhead circuit miles. Considering the fact that SDG&E has substantially less overhead circuitry, as compared to peer utilities, the higher incidence of vehicle contact ignitions potentially correlates to an increased risk from this ignition driver in SDG&E's service territory. However, beyond undergrounding, SDG&E's WMP lacks detail on which initiatives it is implementing to reduce the risk of vehicle contact ignitions.
Condition	In its first quarterly report, SDG&E shall: i. list and describe the actions it is taking to study the occurrence and potential consequence of vehicle contact caused ignitions in its service territory; ii. efforts it is taking to mitigate the occurrence of such ignitions in the future; iii. the status of the action and efforts identified in (i) and (ii) above, including timelines for completion; iv. the specific initiatives in its 2020 WMP that aim to reduce the risk of vehicle contact caused ignitions; and v. its goals, targets and quantitative measures for evaluating effectiveness of the initiatives identified in (iv) at reducing the risk of vehicle contact caused ignitions.

SDGE-3	SDG&E fails to explain how it plans to incorporate lessons learned into updates of its risk models.
Class	B
Deficiency	In Section 5.3.1.1 of its WMP, SDG&E fails to explain how it plans to incorporate lessons learned into updates of its risk models. For instance, the model does not currently factor in spot fires or emergency resources.
Condition	In its first quarterly report, SDG&E shall describe: i. how it plans to incorporate learnings into its risk models, including a specific timeline for implementation; ii. changes or updates to its risk models identified after 2020 WMP submission; and iii. the status of implementing the changes and updates identified in (ii) above, including the expected timeframe for completion.

SDGE-4	SDG&E does not provide sufficient detail on strategic undergrounding pilots.
Class	B
Deficiency	In addressing its undergrounding efforts, SDG&E states it will determine a need to strategically underground lines through pilots that establish a baseline for project scope, cost and schedule, but does not provide sufficient detail on how it will report and share its findings.
Condition	In its first quarterly report, SDG&E shall: i. detail its plans to report and share the findings of its undergrounding pilot initiatives; ii. outline what data it plans to collect and report for project scope, cost and schedule of these projects, and iii. explain how it intends to track and measure the effectiveness of these projects in comparison to other WMP initiatives.

SDGE-5	SDG&E does not provide sufficient detail on need for regulatory assistance.
Class	B
Deficiency	SDG&E acknowledges potential easement and line extension barriers (from main road to house) related to undergrounding efforts, and requests regulatory assistance to alleviate barriers. However, SDG&E does not provide specific detail regarding the type of regulatory assistance needed, the required timeframe for such actions, or its plans for obtaining the needed assistance from regulators.
Condition	In its first quarterly report, SDG&E shall: i. list and describe all regulatory barriers to implementation of its undergrounding initiatives, ii. detail its proposals for specific regulatory changes needed to eliminate the barriers identified in (i) above; and iii. describe its efforts and actions over the past 3 years to collaborate with regulators and other entities responsible for implementing the regulatory changes identified in (ii) above, including status and expected timeline for implementation.

SDGE-6	SDG&E does not provide sufficient detail on plans for reinforcing transmission lines.
Class	B
Deficiency	SDG&E's WMP lacks sufficient detail to demonstrate the efficacy of its plans for reinforcing transmission lines – to have at least one hardened line into every transmission substation in the HFTD by 2020 and to harden 66 miles within a three-year period.
Condition	In its first quarterly report, SDG&E shall: i. detail how it plans to measure and report the efficacy of its plans to reinforce transmission lines and, specifically, to have at least one hardened line into every transmission substation in the HFTD by 2020 and to harden 66 miles within the three-year plan period; ii. list and describe the specific actions and initiatives it plans to implement to achieve this plan for its transmission lines; and iii. the status and timeline for completion of all actions and initiatives identified in (ii) above.

SDGE-7	Potential redundancies in vegetation management activities.
Class	B
Deficiency	The scope and magnitude of its vegetation management activities raised concerns about potential redundancies. SDG&E seems to provide potentially redundant programs and measures, and greater evaluation of its "Master Schedule" as mentioned throughout Section 5.3.5 was needed. The Master Schedule, supplied in response to a WSD data request, only displays the schedule for routine vegetation inspections and work.
Condition	In its first quarterly report, SDG&E shall: i. describe how it assesses its vegetation management processes to determine effectiveness; and ii. provide additional evaluation on how inspections overlap with one another both in timing and scope, including evaluation of effectiveness in terms of number and quality of findings per inspection. For example, if not many findings are being made, then SDG&E should provide an assessment of whether additional efforts are necessary.

SDGE-8	Consideration of environmental impacts, local community input.
Class	B
Deficiency	SDG&E does not provide sufficient detail regarding how it measures and accounts for the potential environmental impacts related to its vegetation management work or how it incorporates input from local stakeholders in planning and executing its vegetation management work.
Condition	In its first quarterly report, SDG&E shall describe: i. how it measures and accounts for the potential environmental impacts related to its vegetation management work; and ii. how it incorporates input from local stakeholders in planning and executing its vegetation management work.

SDGE-9	SDG&E does not explain how investments in undergrounding reduce planned vegetation management spend.
Class	B
Deficiency	SDG&E indicates in its WMP plans for significant investment in undergrounding. We anticipate that increased underground infrastructure will result in cost savings from reduced or eliminated need for vegetation management for underground infrastructure. However, SDG&E's WMP reports no changes in vegetation management costs over the plan period (i.e. 2020-2022) and lacks detail on how its planned investment in undergrounding initiatives correlates to cost savings in other initiatives, such as vegetation management.
Condition	In its first quarterly report, SDG&E shall describe: i. whether and how it takes ancillary cost savings into account when evaluating the effectiveness of undergrounding initiatives; and ii. how SDG&E plans to account for realized cost savings through a reduced need for certain vegetation management activities, resulting from its undergrounding investments.

SDGE-10	Use of outside entities for fuel reduction.
Class	C
Deficiency	SDG&E's fuel reduction plans are still in an elementary phase. Scrutiny on the effectiveness of using grants and outside entities to perform such work is needed to determine if this effort is more or less effective than having SDG&E staff perform the work themselves, or if this measure alleviates critical resource constraints.
Condition	In its annual update, SDG&E shall detail: i. whether fuel reduction projects via outside entities are being completed, and ii. how they tie into the overall vegetation management program in terms of effectiveness.

SDGE-11	Lack of detail on vegetation management around substations.
Class	B
Deficiency	In Section 5.3.5, SDG&E's WMP lacks detail regarding its vegetation management efforts for substations beyond maintaining conductor clearance.
Condition	In its first quarterly report, SDG&E shall: i. describe how it plans fuels reduction work around its substations; and ii. whether and how it maintains defensible space around its substations.

SDGE-12	Details of quality assurance, quality control.
Class	B
Deficiency	SDG&E's WMP describes a quality assurance and quality control efforts designed to evaluate and ensure the effectiveness of its vegetation management and inspection activities. However, SDG&E's WMP lacks sufficient detail regarding how these quality assurance and quality control efforts measure and evaluate the effectiveness of vegetation management and inspection activities.
Condition	In its first quarterly report, SDG&E shall: i. describe the process and measures for how its quality assurance and quality control (QA/QC) efforts evaluate the effectiveness of vegetation management and inspection activities, ii. list and describe all QA/QC audits performed, the timing of the audits, and the quantitative results of such audits, and iii. list and describe all changes implemented as a result of QA/QC audit findings.

SDGE-13	Lack of risk reduction or other supporting data for increased time-of-trim clearances.
Class	A
Deficiency	Throughout its WMP, SDG&E expresses an intent to obtain greater clearances than those required or recommended by the Commission. As these vegetation management programs continue to grow in scope, detailed discussion or evidence of the effect of these increased vegetation clearances on utility ignitions remains lacking. Specifically, SDG&E does not detail proposed guidelines for where such a clearance is both feasible and necessary, or scientific evidence or other data showing that such clearance will reduce wildfire risk, as directed in our decision approving SDG&E's 2019 WMP. Further details were provided to the WSD in response to a data request, specifically that SDG&E performs a tree-by-tree analysis with particular concern for "at-risk species" to determine if a 25-foot clearance is beneficial. SDG&E's WMP does not provide results or analysis of the effectiveness of this measure since implementation of its 2019 WMP, as required by D.19-05-039. Without the ability to understand or even observe an incremental benefit of this increased clearance, it will be difficult to determine the effectiveness of this measure.
Condition	SDG&E shall submit an RCP with a plan for the following: i. Comparing areas with and without enhanced post-trim clearances to measure the extent to which post-trim clearance distances affect probability of vegetation caused ignitions and outages. ii. Collaborating with PG&E and SCE in accordance with Conditions PG&E-26 and SCE-12 to develop a consensus methodology for how to measure post-trim vegetation clearance distance impacts on the probability of vegetation caused ignitions and outages

SDGE-14	Granularity of "at-risk species".
Class	B
Deficiency	SDG&E identifies five types of "at-risk" trees - eucalyptus, palm, oak, pine, and sycamore. However, SDG&E identifies these trees by their genus, and based on additional review, the WSD has discovered that not all tree species within a genus are considered "at-risk" trees. As such, SDG&E's WMP lacks sufficient detail to identify the tree species it considers "at-risk" and subject to its enhanced vegetation management programs.
Condition	In its first quarterly report, SDG&E shall detail the following: i. all tree species within the genera identified in its list of "at-risk" trees, ii. the measures, properties and characteristics it considers in identifying "at-risk" trees, and iii. the threshold values of the measures, properties and characteristics identified in (ii) above that result in a species being defined as "at-risk."

SDGE-15	Details of centralized data repository.
Class	B
Deficiency	SDG&E indicates efforts to create a centralized data repository, however, its WMP lacks sufficient detail of the data to be included.
Condition	In its first quarterly report, SDG&E shall: i. list and describe all data it plans to provide in its centralized repository; ii. list and describe the sources and treatment of all data identified in (i) above; and iii. describe the frequency it plans to update all data identified in (i) above.

SDGE-16	Details of cooperative fuel reduction work.
Class	B
Deficiency	A large portion of SDG&E's HFTD area falls within federal lands. As such, it is imperative that SDG&E maintain close coordination and working relationships with the U.S. Forest Service (USFS), who is responsible for managing federal lands. SDG&E identifies specific ways in which it coordinates with the USFS, which appear sufficient for receiving permits for fuel reduction, but SDG&E does not address the resources needed to collaborate on fuel reduction efforts and establish formal agreements.
Condition	In its first quarterly report, SDG&E shall describe: i. whether it plans to collaborate with the USFS on fuel reduction programs in its service territory; ii. what programs or agreements, if any, it has in place with the USFS for fuel reduction programs; iii. the timeline for implementing initiatives identified in (i) and (ii); iv. how it plans to identify the resources needed to collaborate with the USFS on fuel reduction; and v. the status of reaching any formal agreements on fuel reduction efforts.

(End of Appendix A)

APPENDIX B

Detailed Figures & Charts

0. Description of Data Sources

All figures reference the latest submitted versions of 2020 WMPs as of April 10th, 2020. Data is pulled from Tables 1-31 of Utility WMPs unless stated otherwise.

By utility, the WMPs referenced in this document are:

PG&E	Update to WMP submitted March 17th, 2020
SCE	Revision 02 to WMP
SDG&E	Update to WMP submitted March 10th, 2020
Liberty CalPeco	Update to WMP submitted February 28th, 2020
PacifiCorp	Update to WMP submitted February 26th, 2020
Bear Valley Electric Service	Update to WMP submitted February 26th, 2020
Horizon West Transmission	Update to WMP submitted February 28th, 2020
Trans Bay Cable	Update to WMP submitted February 28th, 2020

All are available at cpuc.ca.gov/wildfiremitigationplans.

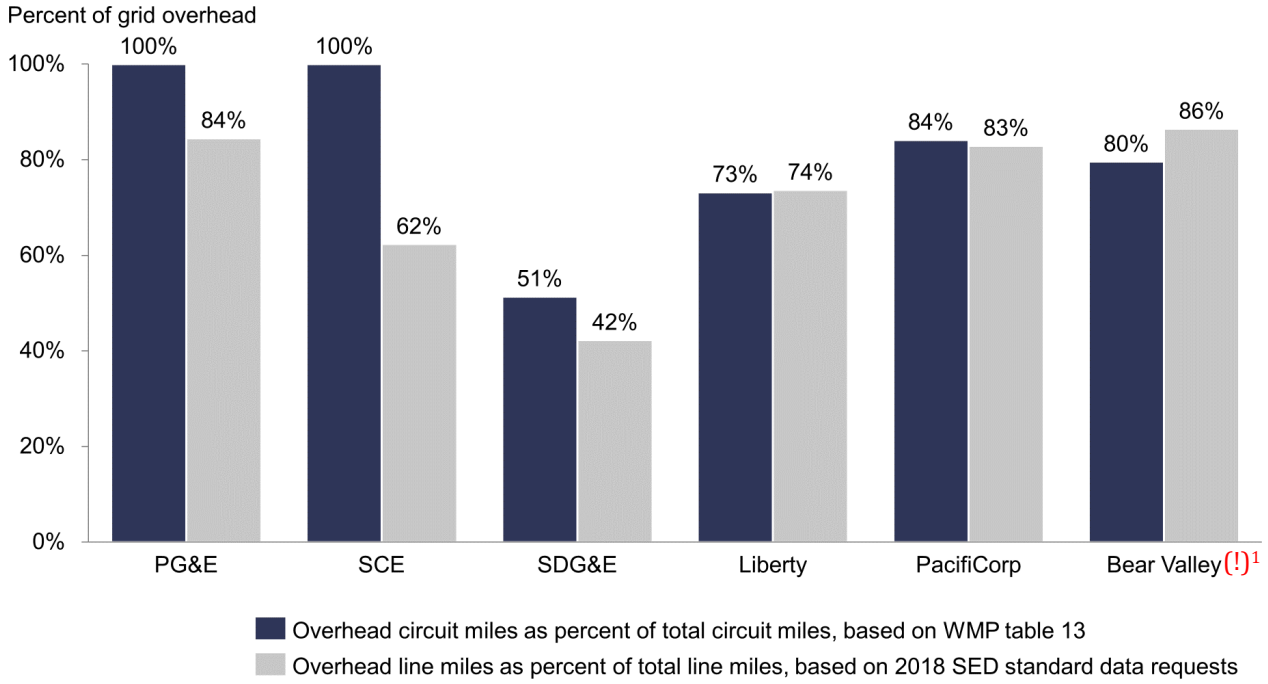
All the analysis and corresponding figures presented in this appendix rely upon data that is self-reported by the utilities. By utilizing and presenting this self-reported data in this appendix, the WSD is not independently validating that all data elements submitted by utilities are accurate. The WSD will continue to evaluate utility data, conduct data requests, and conduct additional compliance activities to ensure that data provided is accurate.

1. Figures

CONTENTS

1.1 Wildfire Risk Exposure

Figure 1.1a: Comparison of data sources for circuit typologies

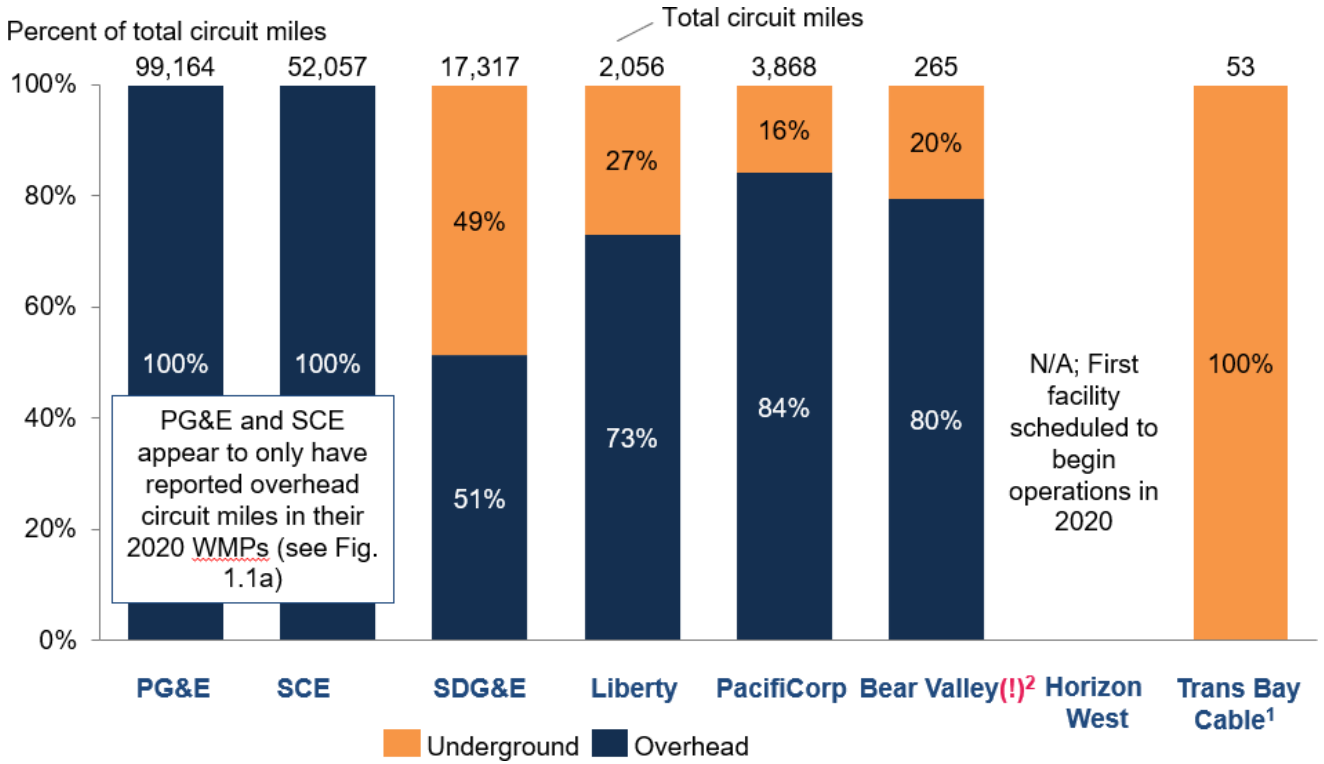


Note: In their 2020 WMPs, PG&E and SCE only reported circuit mileage data for overhead facilities. Based on the best available historical data on circuit mileage and grid topology in the Comission's possession, PG&E is reported to have 84% of its total line miles overhead, and SCE is reported to have 62% of its total line miles overhead. While the 2020 WMP Guidelines directed the utilities to report their grid topology breakdown by circuit miles, rather than line miles, the percentages overhead and underground are expected to be similar. The WSD will issue a data request to confirm accurate underground circuit mileage numbers.

1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

Source: SED standard data requests for annual grid data (reflect values as of December 2018), WMP Table 13

Figure 1.1b: Circuit topology breakdown by overhead and underground circuit miles

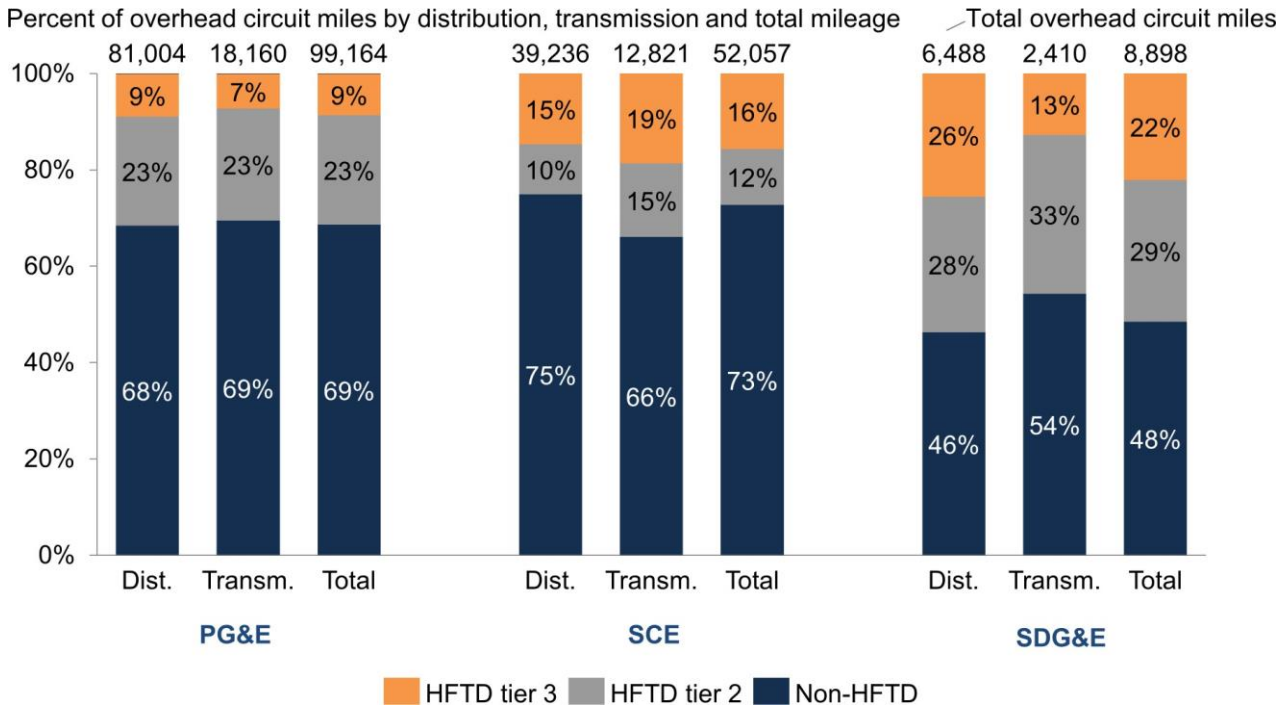


1. Trans Bay Cable did not report underground circuit miles in Table 13 of the WMP, but mentioned on page 8 of its WMP that it had 53 circuit miles of underground submarine cable, which is reflected in this chart.

2. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

Source: WMP Table 13

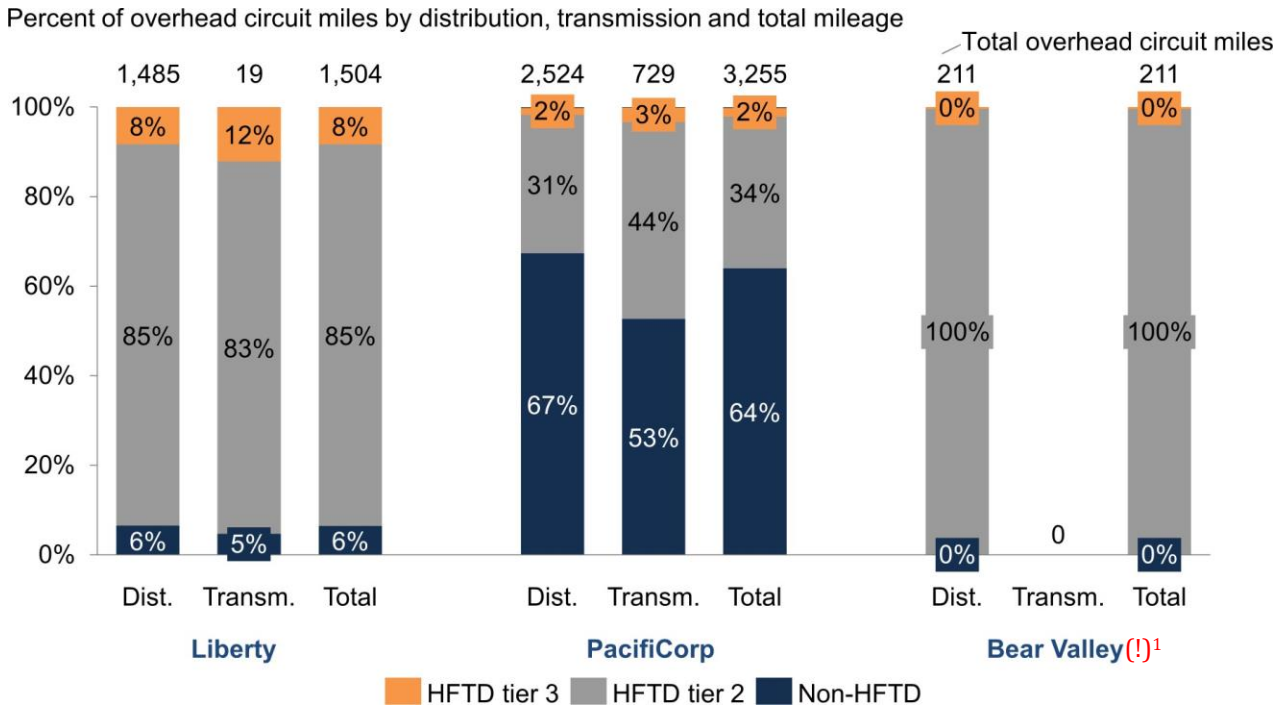
Figure 1.2a: Overhead circuit miles by HFTD Tier (Large Utilities)
Broken out by distribution (dist.) and transmission (transm.)



Note: Zone 1 not shown as subtotal.

Source: WMP Table 13

Figure 1.2b: Overhead circuit miles by HFTD Tier (Small Utilities)
Broken out by distribution (dist.) and transmission (transm.)

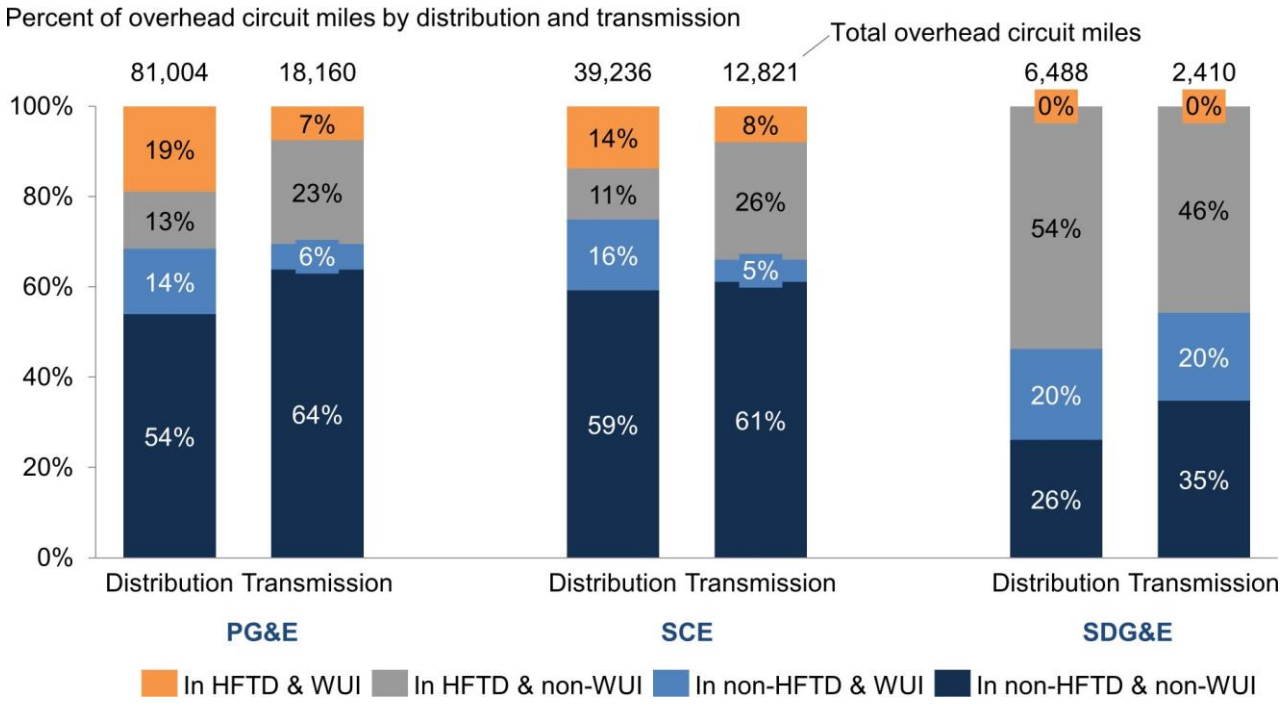


Note: Zone 1 not shown as subtotal.

1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

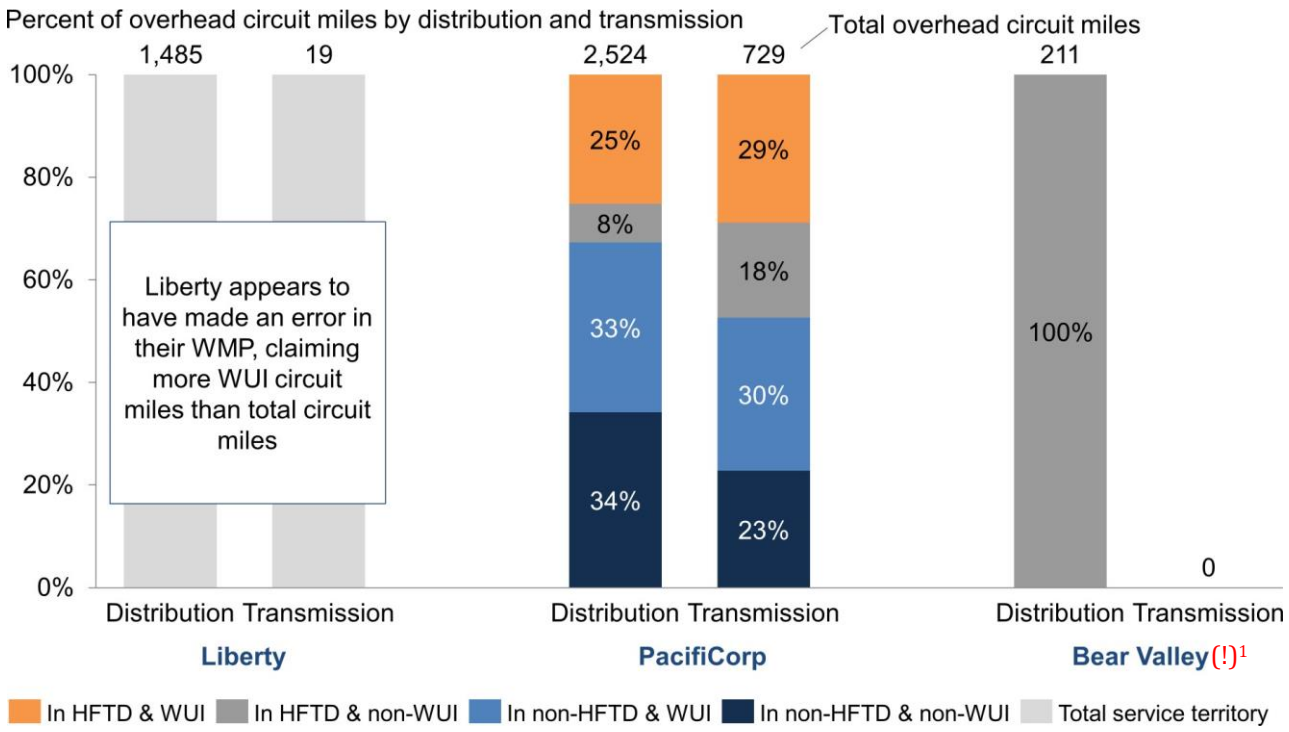
Source: WMP Table 13

Figure 1.3a: Breakdown of overhead transmission and distribution circuit miles by HFTD and WUI location (Large utilities)



Source: WMP Table 13

Figure 1.3b: Breakdown of overhead transmission and distribution circuit miles by HFTD and WUI location (Small utilities)

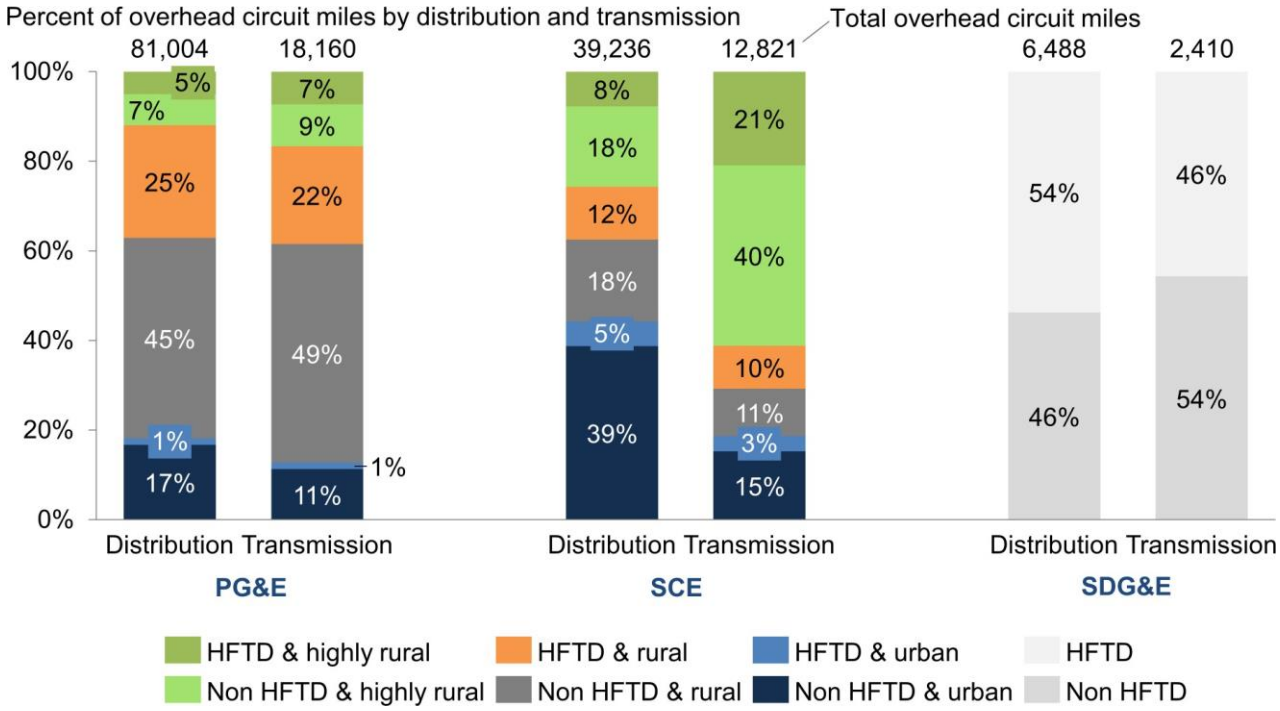


Note: Trans Bay Cable and Horizon West Transmission are not shown. Trans Bay Cable is almost entirely undergroud and submarine, and Horizon West Transmission did not yet have operational facilities at the time it submitted its 2020 WMP.

1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

Source: WMP Table 13

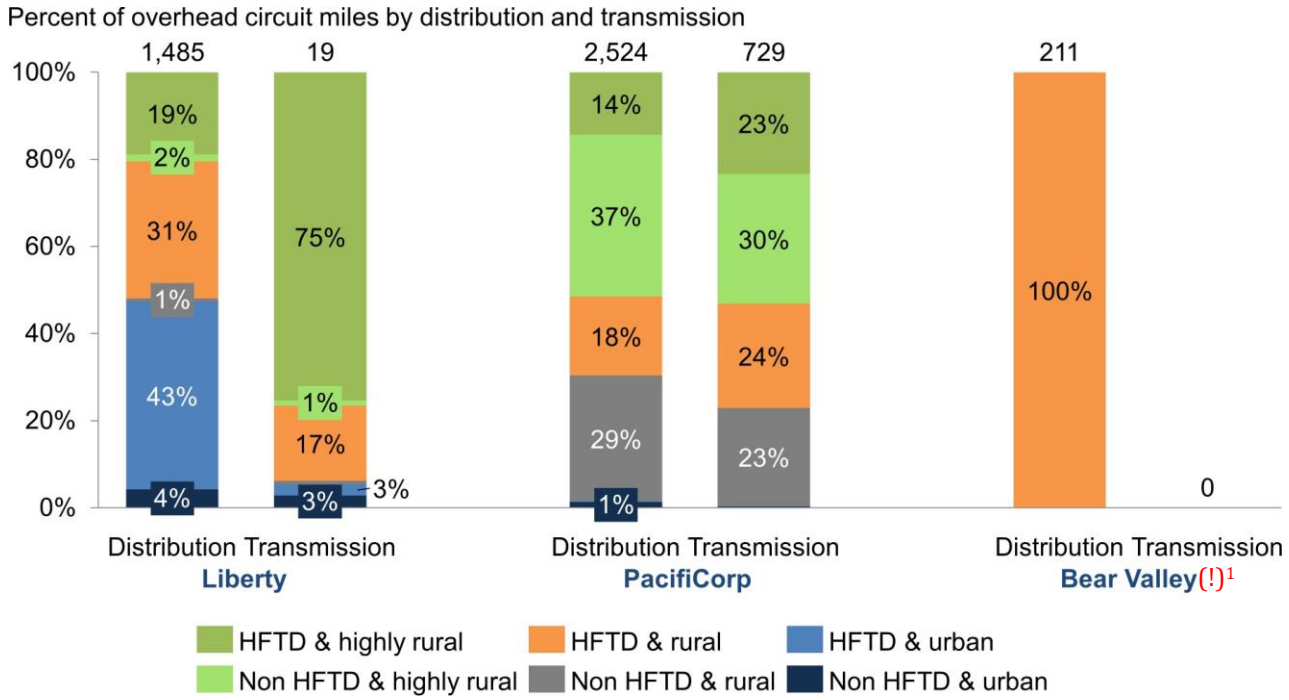
Figure 1.4a: Breakdown of overhead transmission and distribution circuit miles by HFTD and population density (Large utilities)



Note: SDG&E did not report breakdown of circuit mileage between areas of different population densities.

Source: WMP Table 13

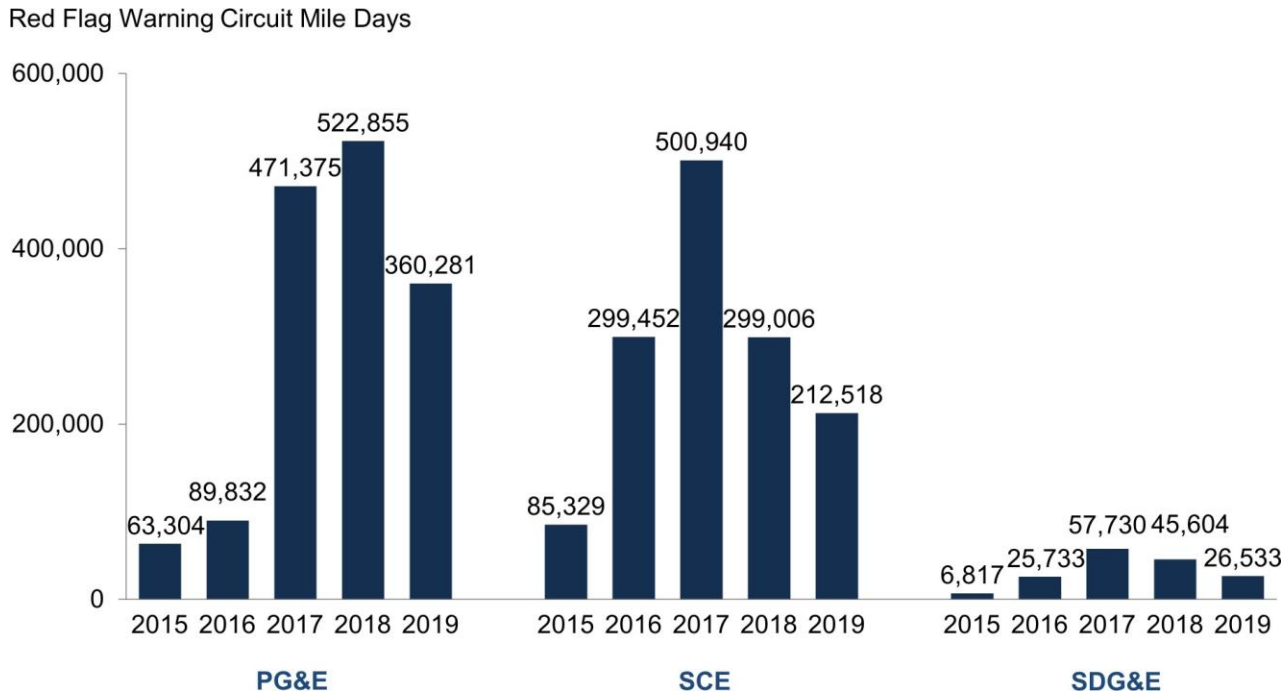
Figure 1.4b: Breakdown of overhead transmission and distribution circuit miles by HFTD and population density (Small utilities)



1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

Source: WMP Table 13

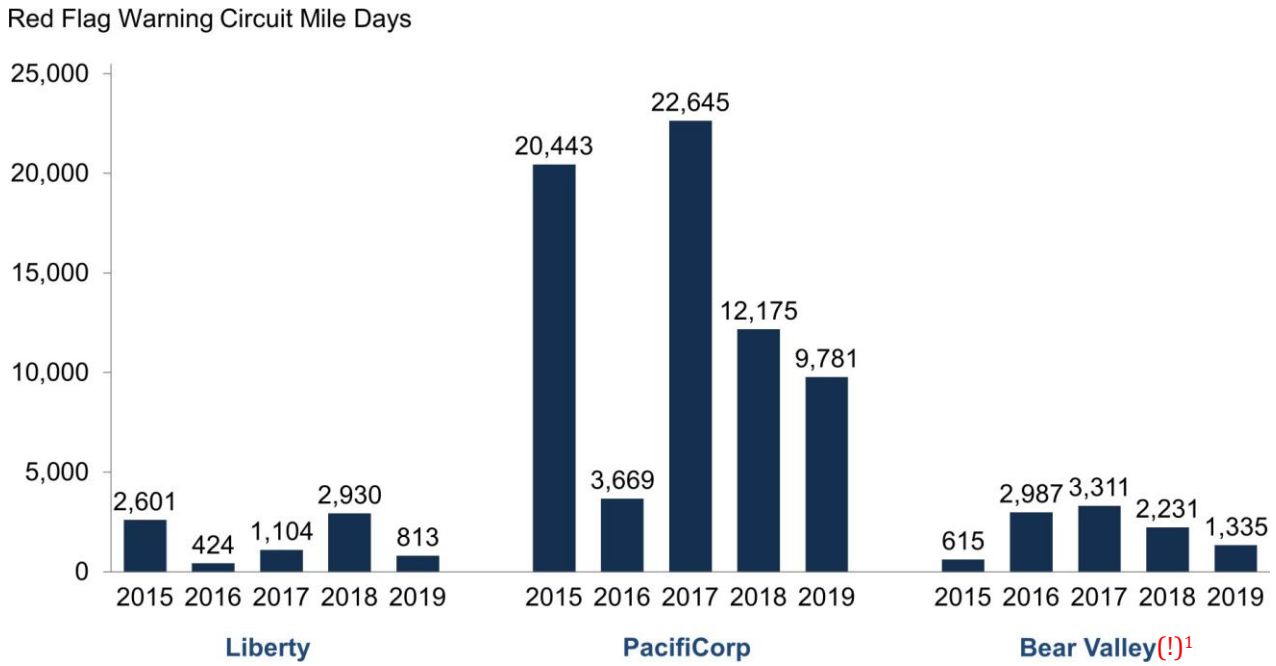
Figure 1.5a: Red flag warning circuit mile days per year by utility (Large utilities)



Note: A "Red Flag Warning (RFW) Circuit Mile Day" is intended to capture the duration and scope of the fire weather that year. It is defined on page 5 of the 2020 WMP Guidelines to be calculated as the number of circuit miles that were under a RFW multiplied by the number of days those miles were under said RFW. For example, if 100 circuit miles were under a RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW circuit mile days would be 110.

Source: WMP Table 10

Figure 1.5b: Red flag warning circuit mile days per year by utility (Small utilities)

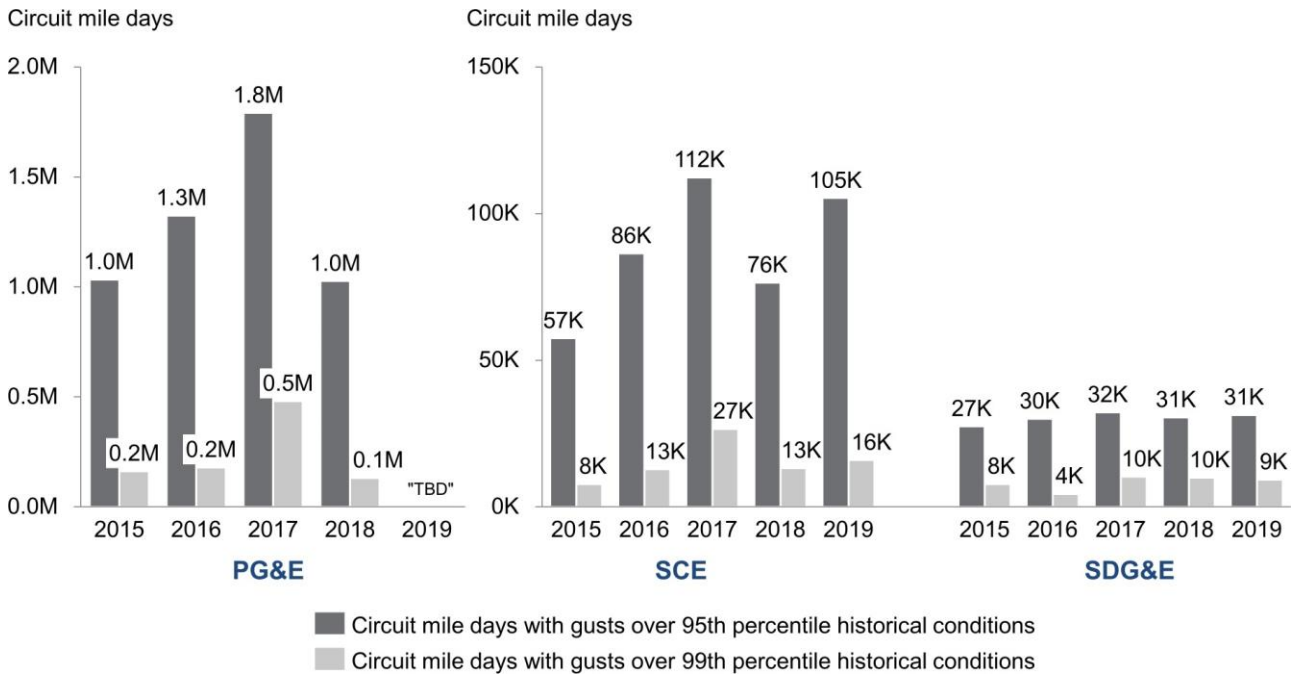


Note: A "Red Flag Warning (RFW) Circuit Mile Day" is intended to capture the duration and scope of the fire weather that year. It is defined on page 5 of the 2020 WMP Guidelines to be calculated as the number of circuit miles that were under a RFW multiplied by the number of days those miles were under said RFW. For example, if 100 circuit miles were under a RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW circuit mile days would be 110.

1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

Source: WMP Table 10

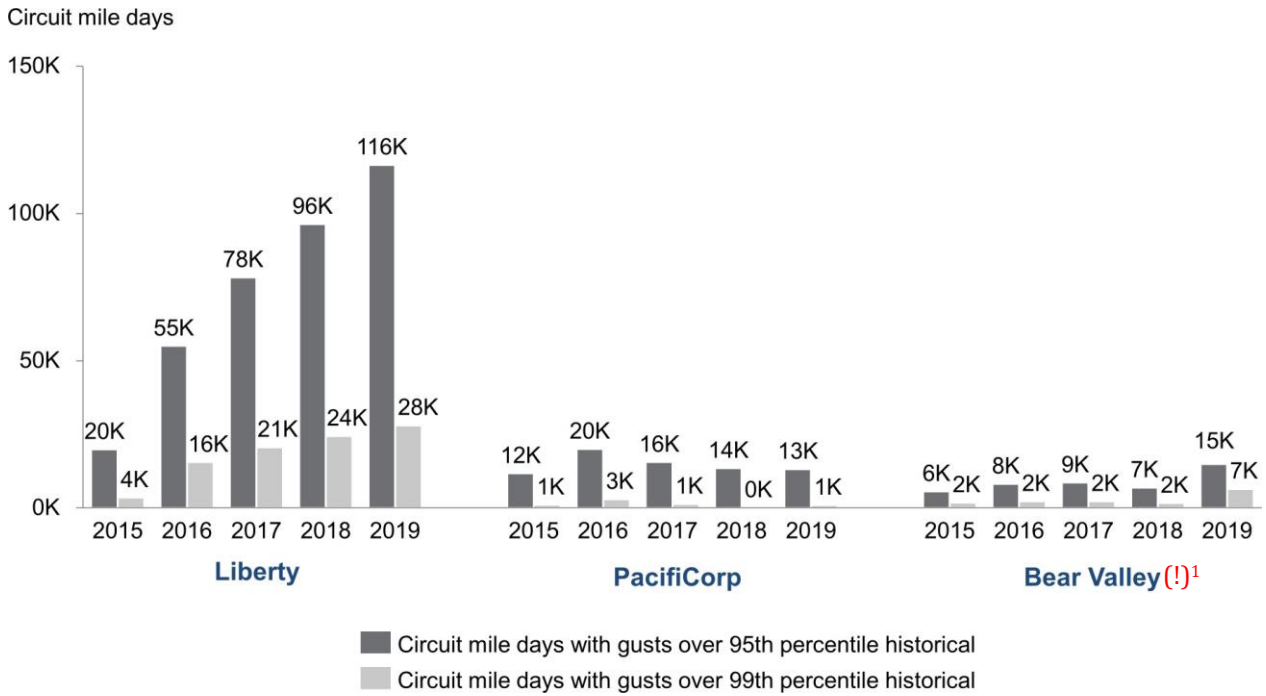
Figure 1.5c: 95th and 99th percentile wind conditions (Large utilities)



Note: Utilities were directed to report historical conditions as conditions over 10 prior years, 2005-2014. SCE appears to have instead reported historical conditions over the 5 prior years, 2009-2014, thus using a different baseline to calculate 95th and 99th percentile wind speeds. More information is needed to fully address potential inconsistencies between utilities. PG&E stated that 2019 data would not be available until late Q2 2020.

Source: WMP Table 10

Figure 1.5d: 95th and 99th percentile wind conditions (Small utilities)



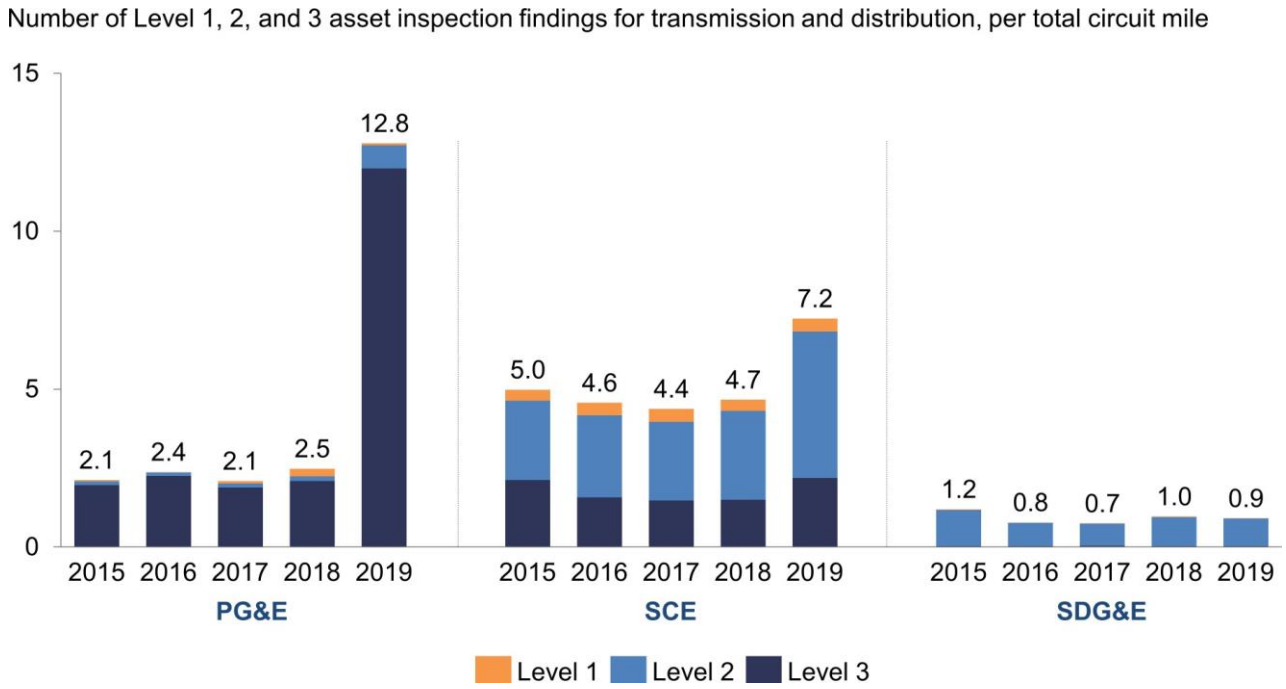
Note: Historical conditions refer to conditions over 10 prior years, 2005-2014.

1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

Source: WMP Table 10

1.2 Outcome Metrics

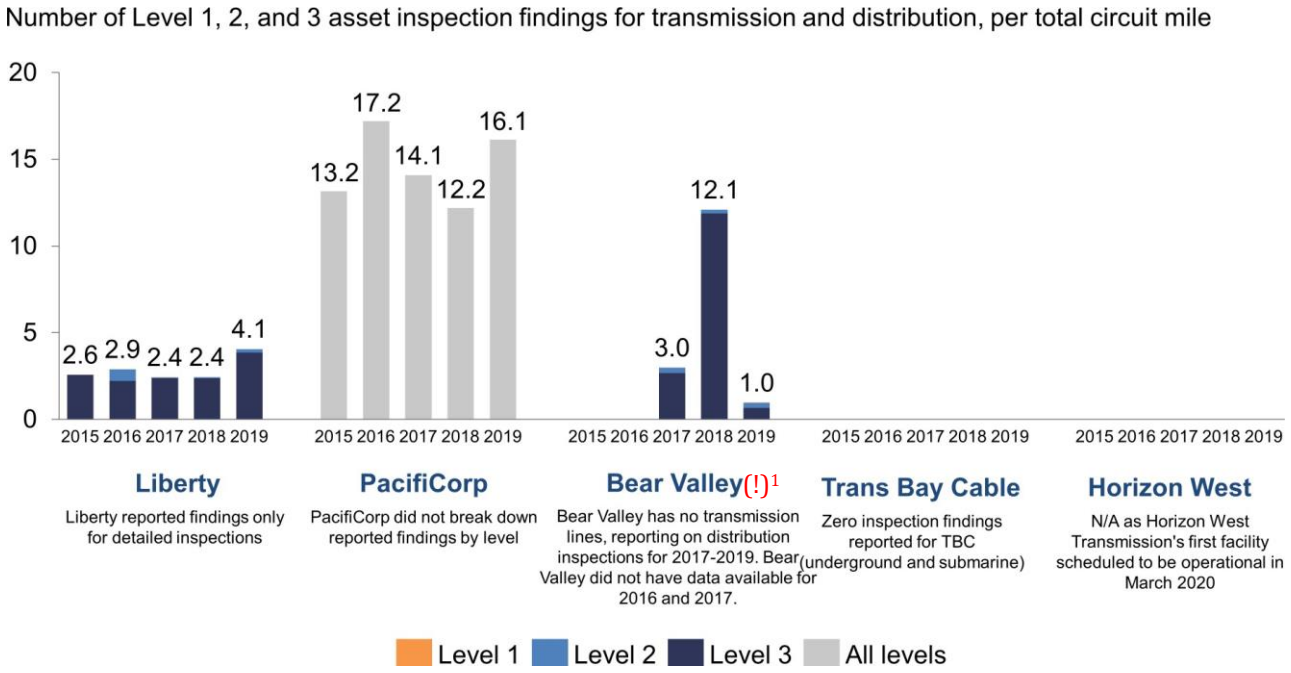
Figure 2.1a: Asset inspection findings normalized by total circuit mileage (Large utilities)



Note: Utilities reported their inspection findings as normalized by total circuit miles in Table 1 of their WMPs.

Source: WMP Table 1

Figure 2.1b: Asset inspection findings normalized by total circuit mileage (Small utilities)

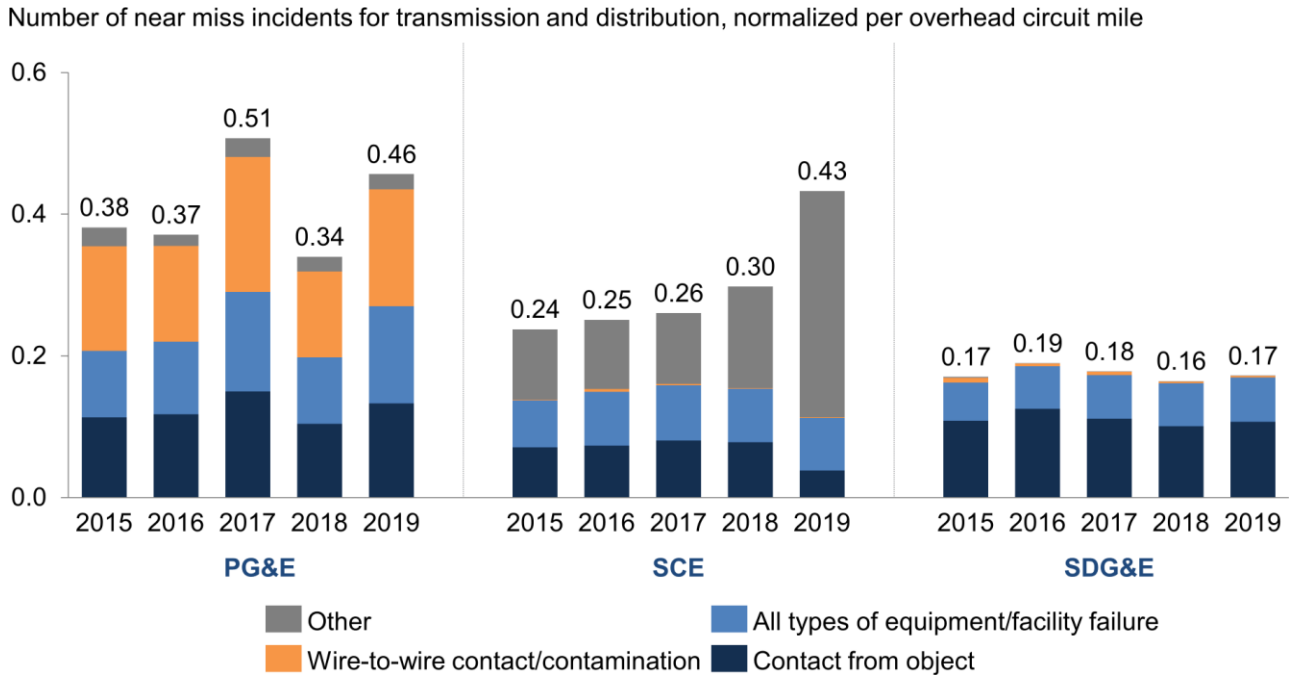


Note: Utilities reported their inspection findings as normalized by total circuit miles in Table 1 of their WMPs. In Table 1, Liberty reported inspection findings in miles between findings rather than in findings per circuit mile as the 2020 WMP Guidelines directed. To represent inspection findings in a way consistent with the reporting of other utilities, the WSD inverted the metric reported by Liberty to show inspection findings in findings per circuit mile in this chart. Bear Valley reported inspecton findings normalized per overhead cirucit mile rather than per total cirucit mile as instructed. For consistency, the WSD re-normalized these findings per total circuit mile using data from Table 13.

1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

Source: WMP Table 1

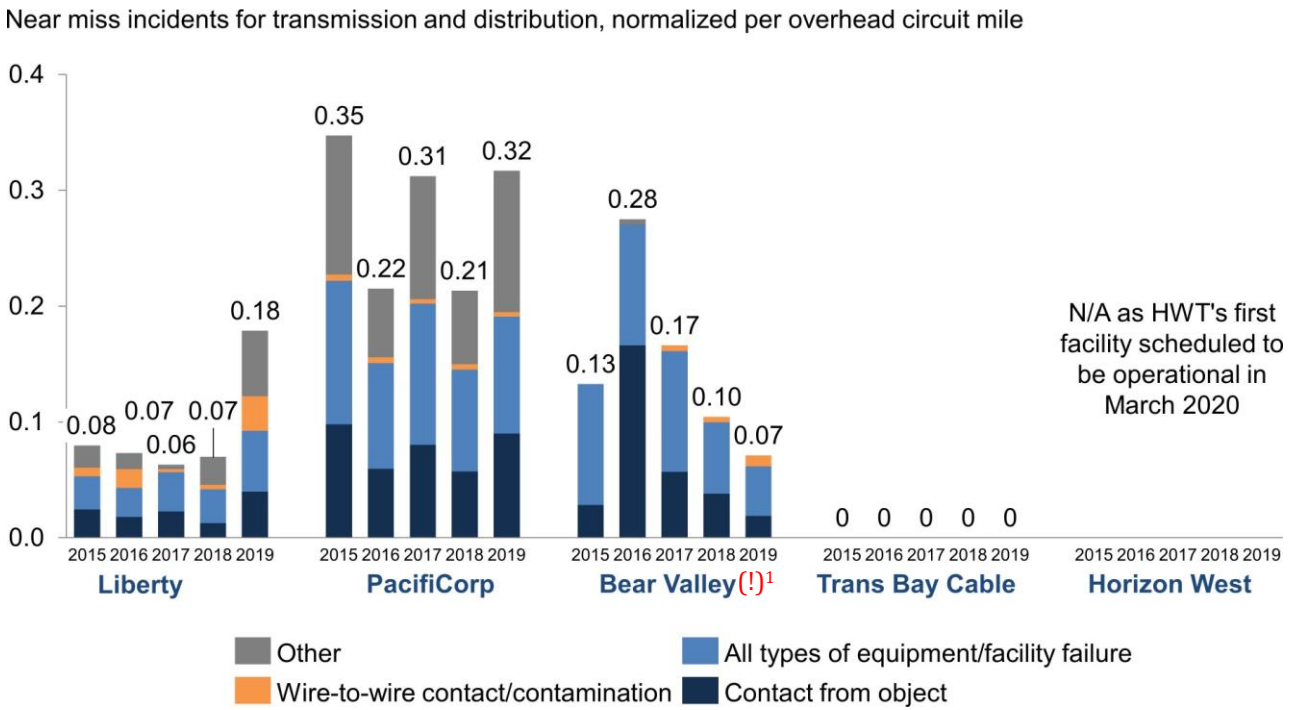
Figure 2.2a: Near miss incidents normalized by overhead circuit mileage (Large utilities)



Note: The measurement of each 'near miss' is not yet perfectly standardized across utilities. The WSD will work toward a more standardized approach for tracking and classifying near miss data for 2021 WMPs. A near miss was defined in the 2020 WMP Guidelines as "An event with significant probability of ignition, including wires down, contacts with objects, line slap, events with evidence of significant heat generation, and other events that cause sparking or have the potential to cause ignition."

Source: Tables 11a and 11b from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs; SDG&E equipment failure numbers adjusted to address inconsistencies in subtotal calculations provided by SDG&E.

Figure 2.2b: Near miss incidents normalized by overhead circuit mileage (Small utilities)



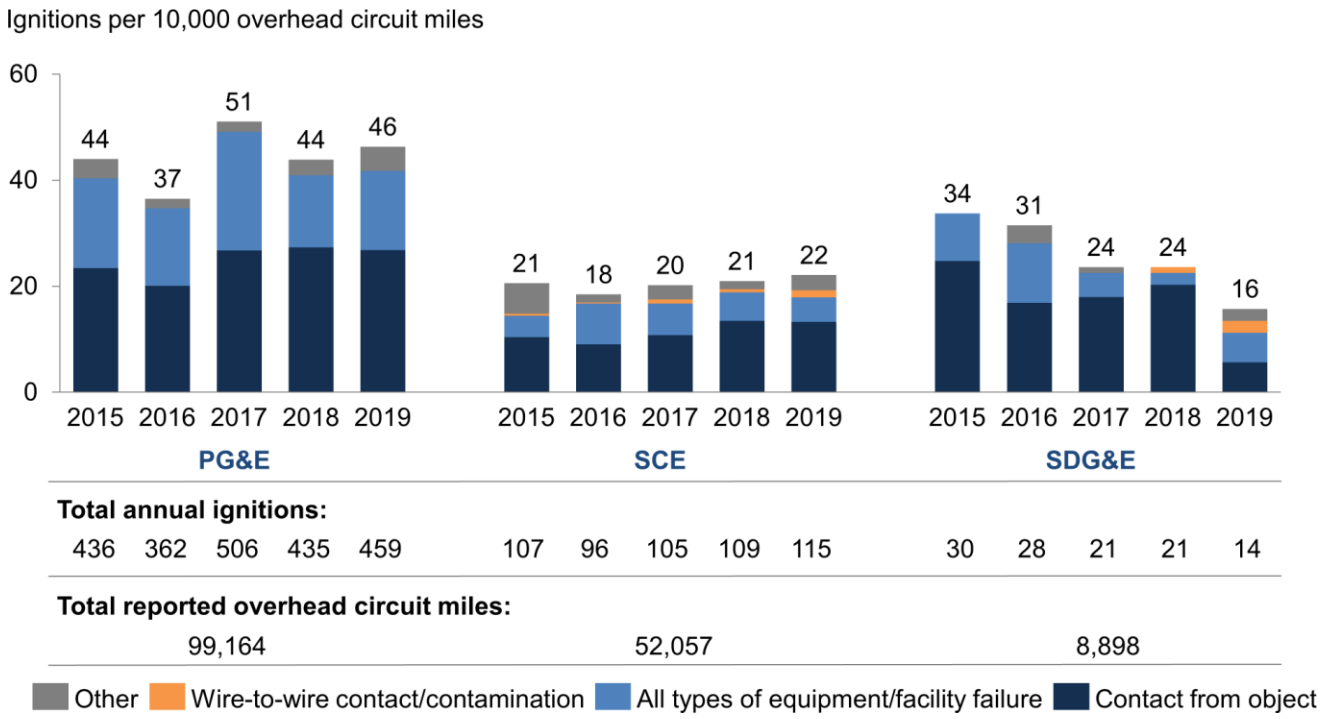
Note: The measurement of each 'near miss' is not yet perfectly standardized across utilities. The WSD will work toward a more standardized approach for tracking and classifying near miss data for 2021 WMPs. A near miss was defined in the 2020 WMP Guidelines as "An event with significant probability of ignition, including wires down, contacts with objects, line slap, events with evidence of significant heat generation, and other events that cause sparking or have the potential to cause ignition."

For PacifiCorp, the largest drivers of "Other" near misses were "Other" (50% on average over the 5 year period) and "Unknown" (42% on average over the 5 year period).

1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

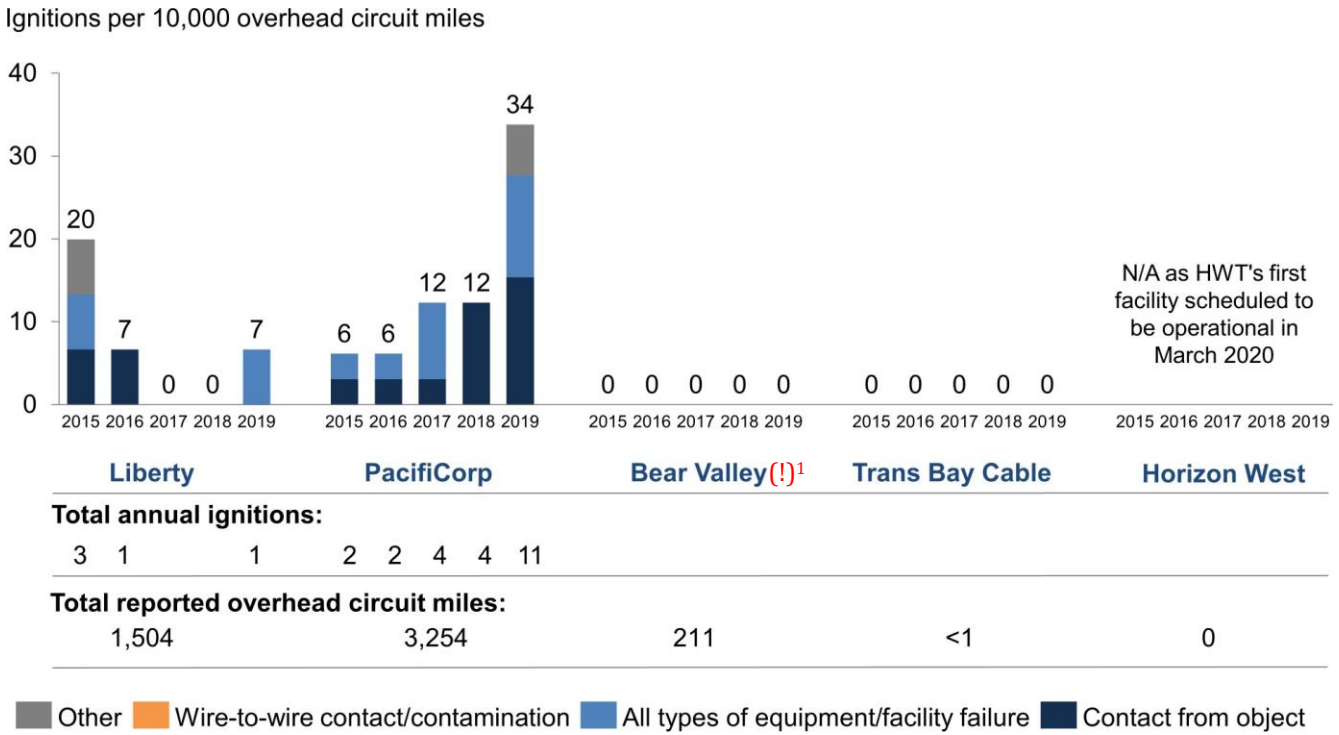
Source: Tables 11a and 11b from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs; BVES numbers adjusted to address inconsistencies in subtotal calculations provided.

Figure 2.3a: Number of ignitions, normalized by overhead circuit mileage (Large utilities)



Source: Tables 11a and 11b from utility WMPs and data requests normalized by data from Table 13 of utility WMPs; SDG&E equipment failure numbers adjusted to address inconsistencies in subtotal calculations provided.

Figure 2.3b: Number of ignitions, normalized by overhead circuit mileage (Small utilities)

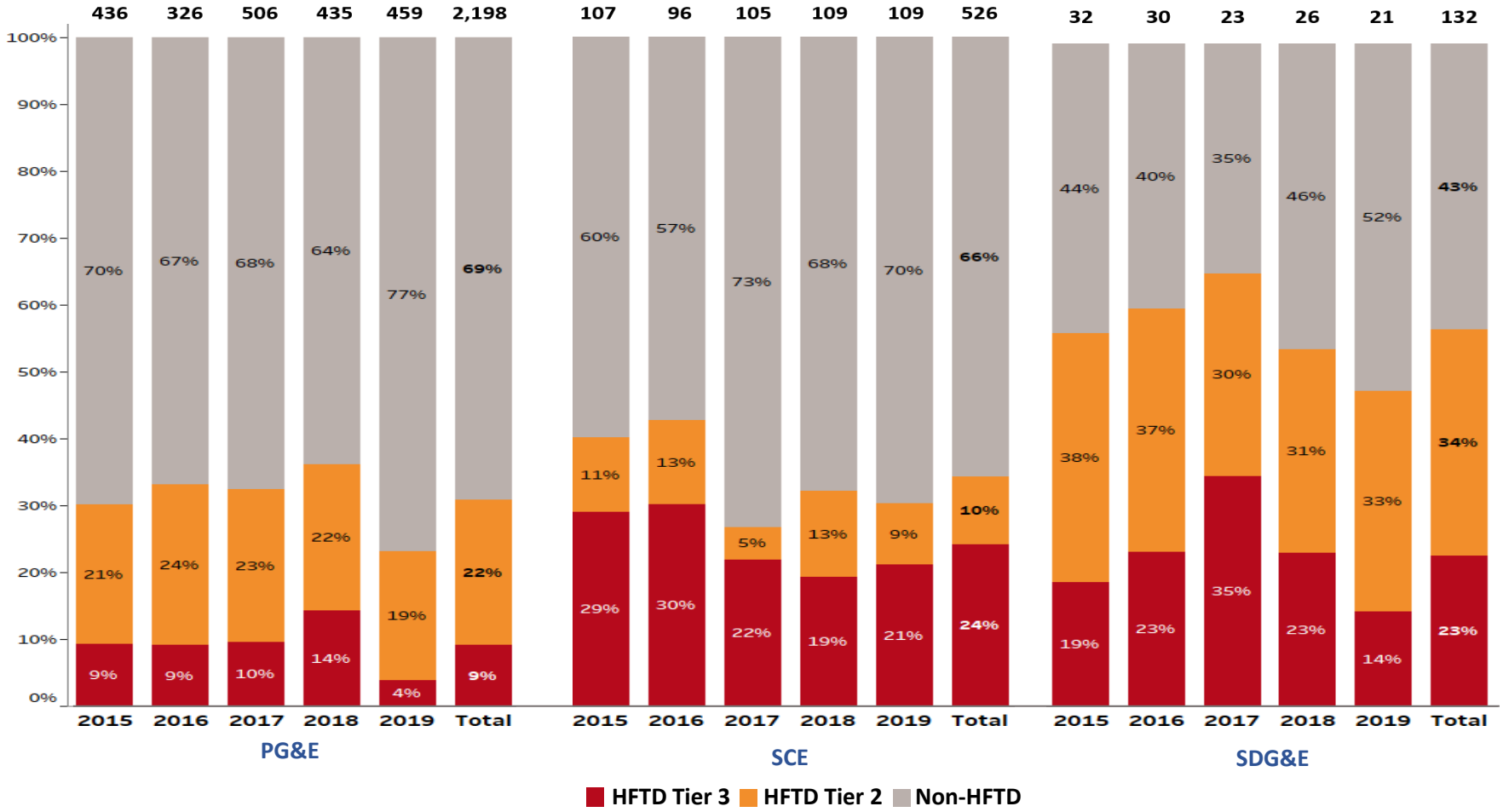


Note: Total number of ignititions only shown for utilities and years where ignitions were greater than zero.

1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

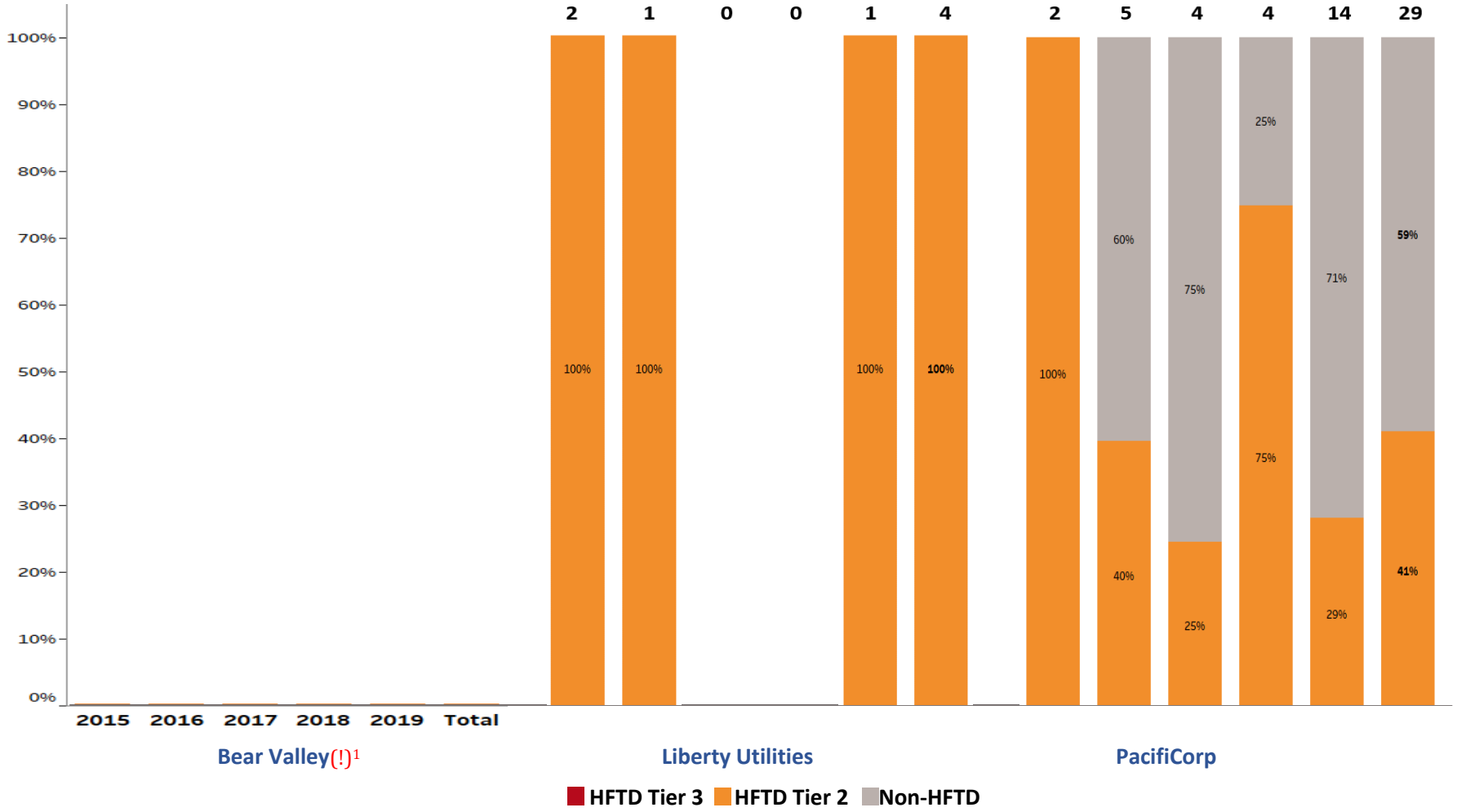
Source: Tables 11a and 11b from utility WMPs and data requests normalized by data from Table 13 of utility WMPs; PacifiCorp numbers adjusted to account for Tables 11c and 11d.

Figure 2.4a: Total ignitions by HFTD location (Large utilities)



Note: Ignitions in Zone 1 HFTD areas make up less than 1% of total ignitions.
Source: Table 2 from utility WMPs

Figure 2.4b: Total ignitions by HFTD location (Small utilities)

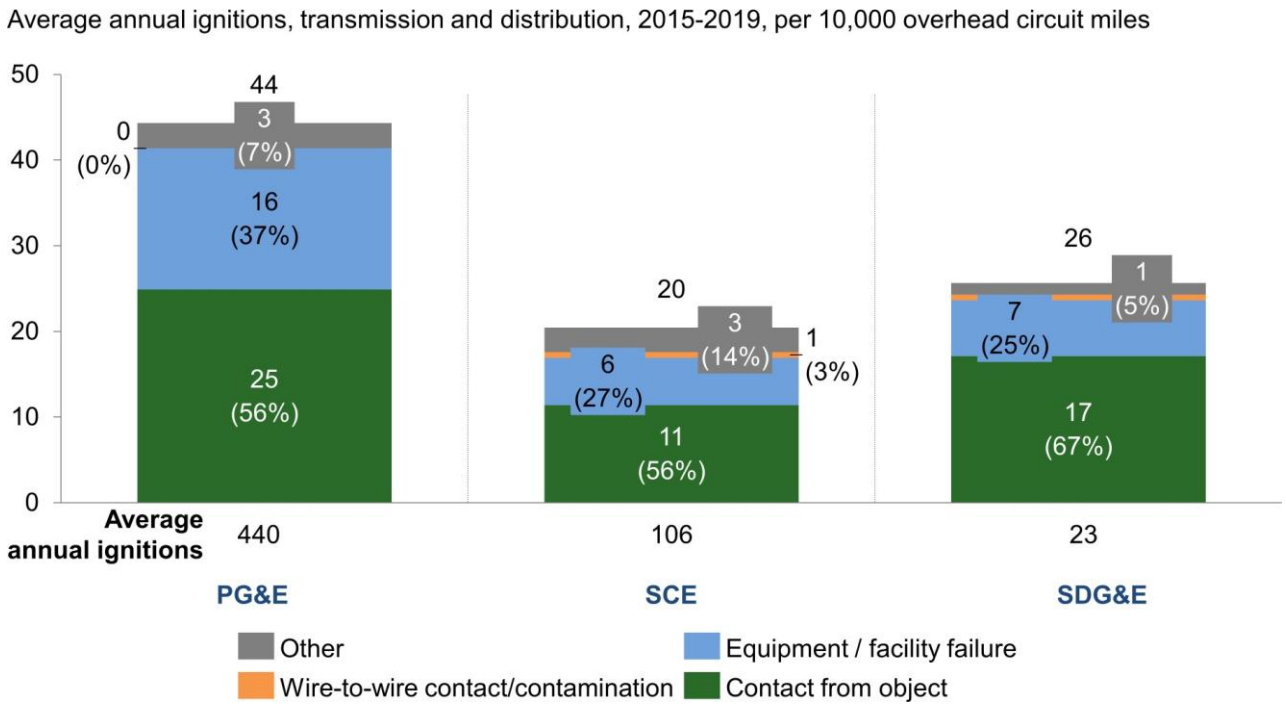


Note: Ignitions in Zone 1 HFTD areas make up less than 1% of total ignitions.

1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

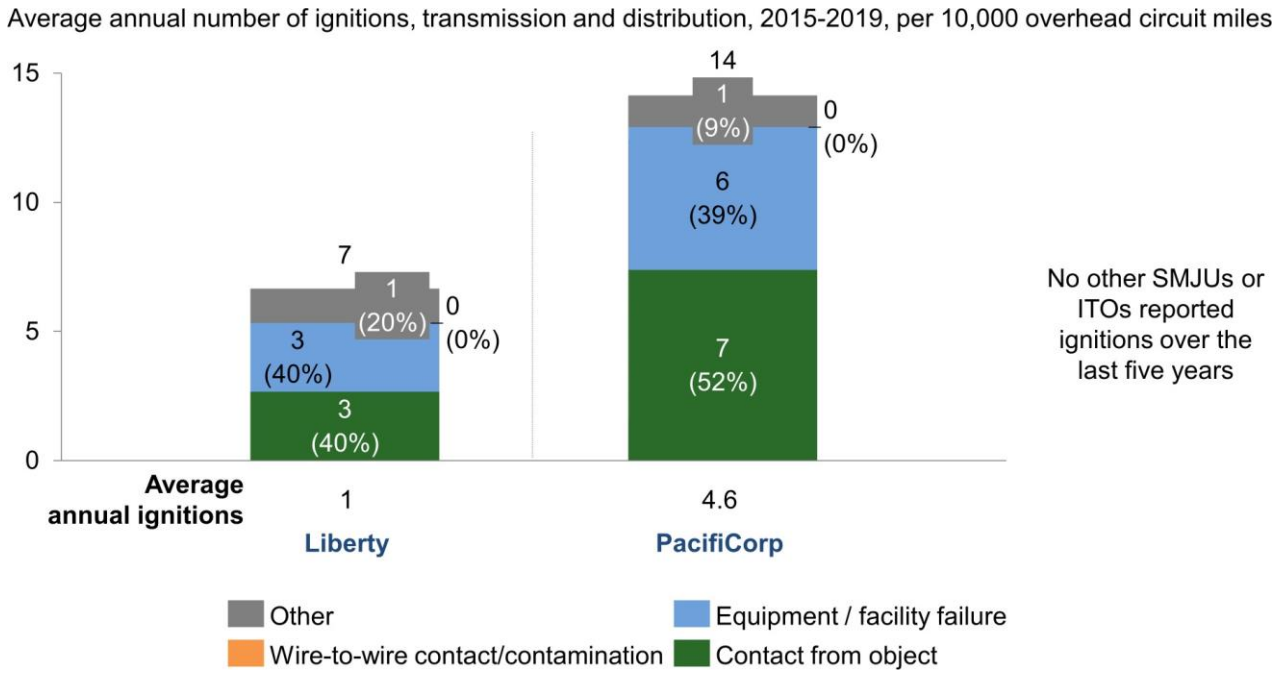
Source: Table 2 from utility WMPs

Figure 2.5a: Ignitions by ignition probability driver type (Large utilities)



Source: Tables 11a and 11b from utility WMPs and data requests normalized by data from Table 13 of utility WMPs; SDG&E equipment failure numbers adjusted to address inconsistencies in subtotal calculations provided.

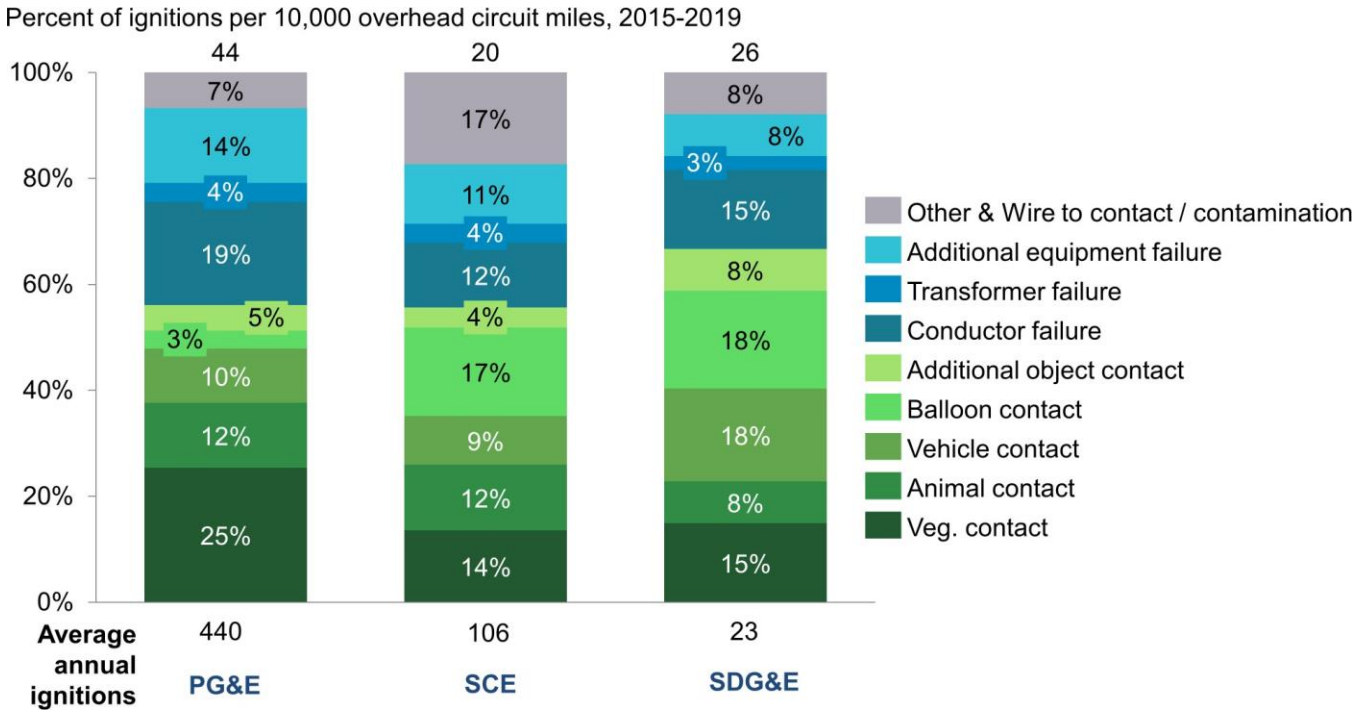
Figure 2.5b: Ignitions by ignition probability driver type (Small utilities)



Note: Since Liberty and PacifiCorp have less than 10,000 overhead circuit miles, their average number of total annual ignitions per 10,000 circuit miles is greater than their average number of total annual ignitions.

Source: Tables 11a and 11b from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs; PacifiCorp numbers adjusted to account for Tables 11c and 11d.

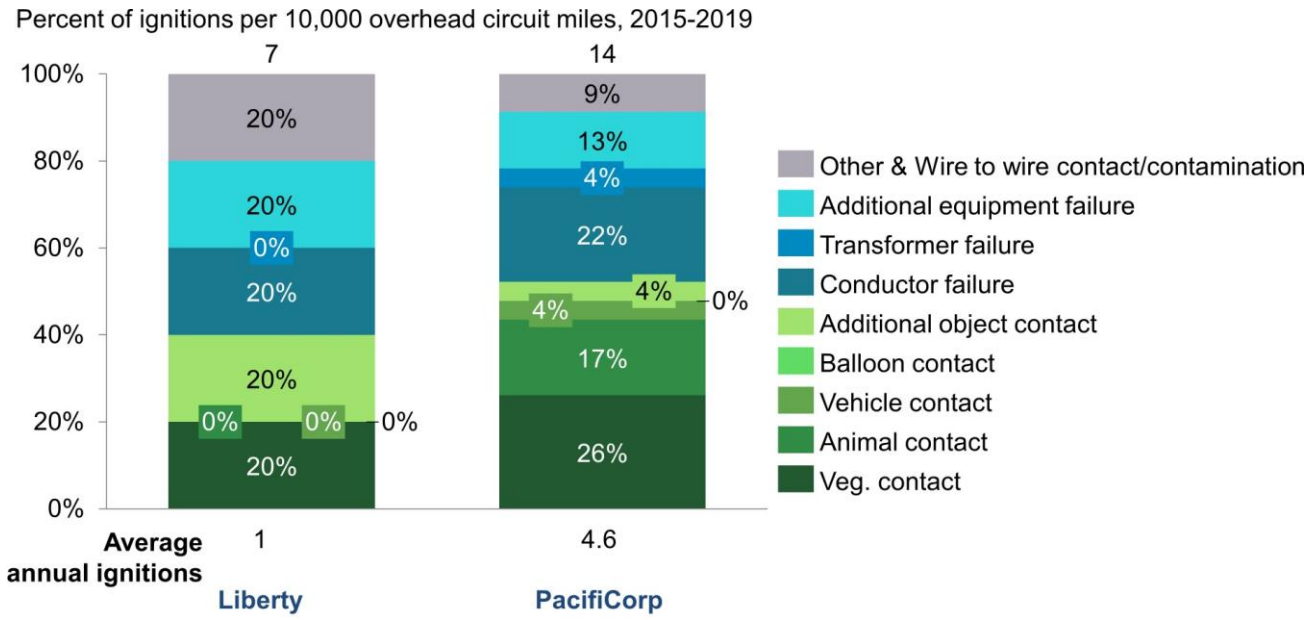
Figure 2.6a: Detail: Share of ignitions due to each ignition probability driver (Large utilities)



Note: Conductor failure includes conductor failure (as reported), splice, clamp and connector. Other includes wire to wire contact / contamination.

Source: Tables 11a and 11b from utility WMPs and data request normalized by data from Table 13 of utility WMPs; SDG&E equipment failure numbers adjusted to address inconsistencies in subtotal calculations provided. Since SDG&E has less than 10,000 overhead circuit miles, its average number of total annual ignitions per 10,000 circuit miles is greater than its average number of total annual ignitions.

Figure 2.6b: Detail: Share of ignitions due to each ignition probability driver (Small utilities)

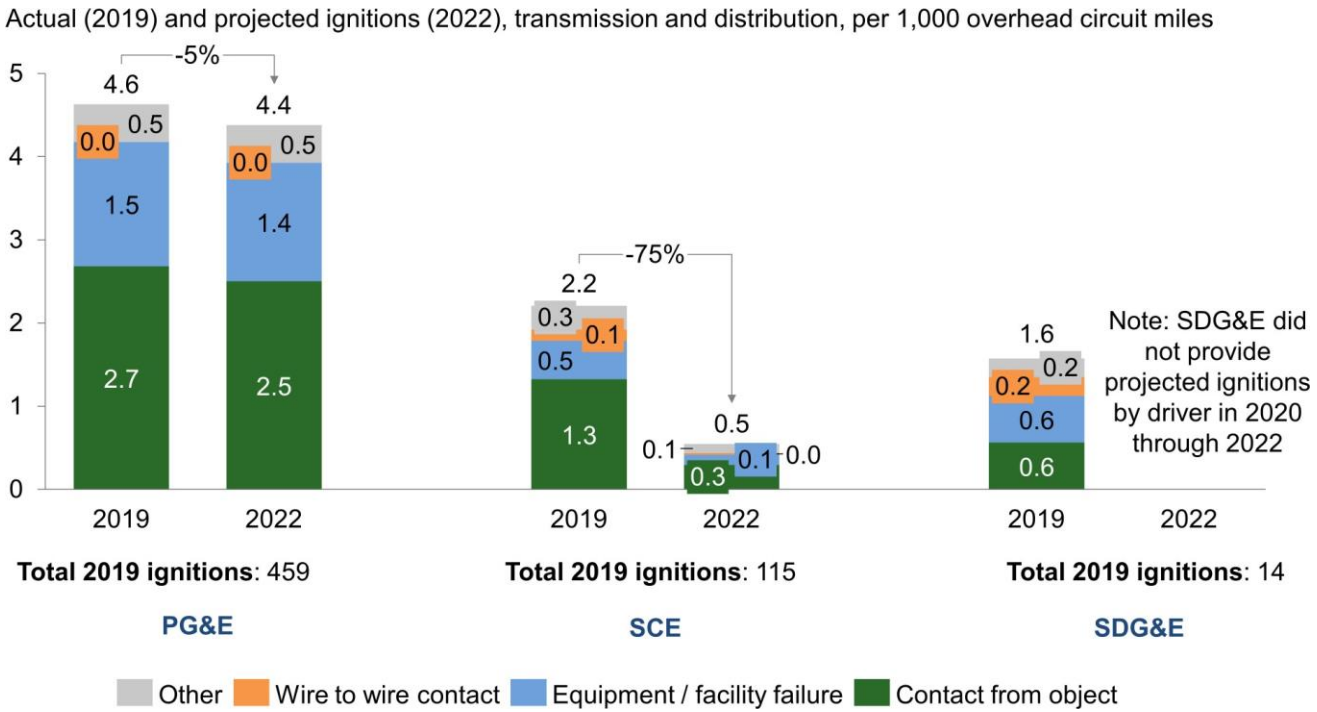


No other small utilities reported ignitions over the last five years

Note: Conductor failure includes conductor failure (as reported), splice, clamp and connector. Other includes wire-to-wire contact / contamination. Since Liberty and PacifiCorp have less than 10,000 overhead circuit miles, their average number of total annual ignitions per 10,000 circuit miles is greater than their average number of total annual ignitions.

Source: Tables 11a and 11b from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs; PacifiCorp numbers adjusted to account for Tables 11c and 11d.

Figure 2.7a: Actual and projected ignitions for top ignition drivers, 2019 and 2022



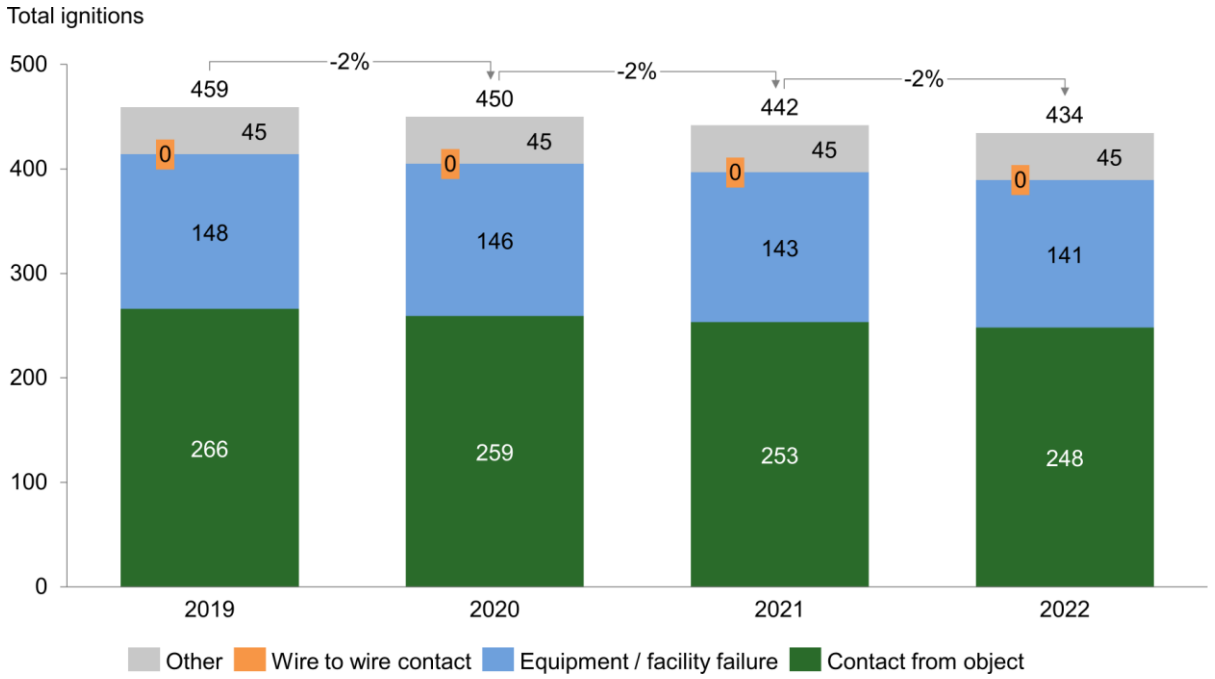
Note: Projections assume WMP implementation acording to plan and weather pattens consistent with 5 year historical average. See the 2020 WMP Guidelines for further detail.

Small utilities populated Table 31 either not at all or with all zeroes. Specifically: Horizon West Transmission left it blank as it did not yet have operational facilities when it submitted its 2020 WMP; Trans Bay Cable and Bear Valley Electric Service reported anticipating no ignitions (having seen no ignitions in the past 5 years); Liberty did not populate Table 31; PacifiCorp reported only a general reducing trend anticipated with no discrete data available.

Source: Tables 11a, 11b, 31a, and 31b from utility WMPs and data requests; SDG&E equipment failure numbers adjusted to address inconsistencies in subtotal calculations provided by SDG&E.

Figure 2.7b: PG&E Detail: Actual and projected ignitions for top ignition drivers, 2019 and 2022

Figure shows reported 2019 ignitions and projected future ignitions by driver category, for transmission and distribution

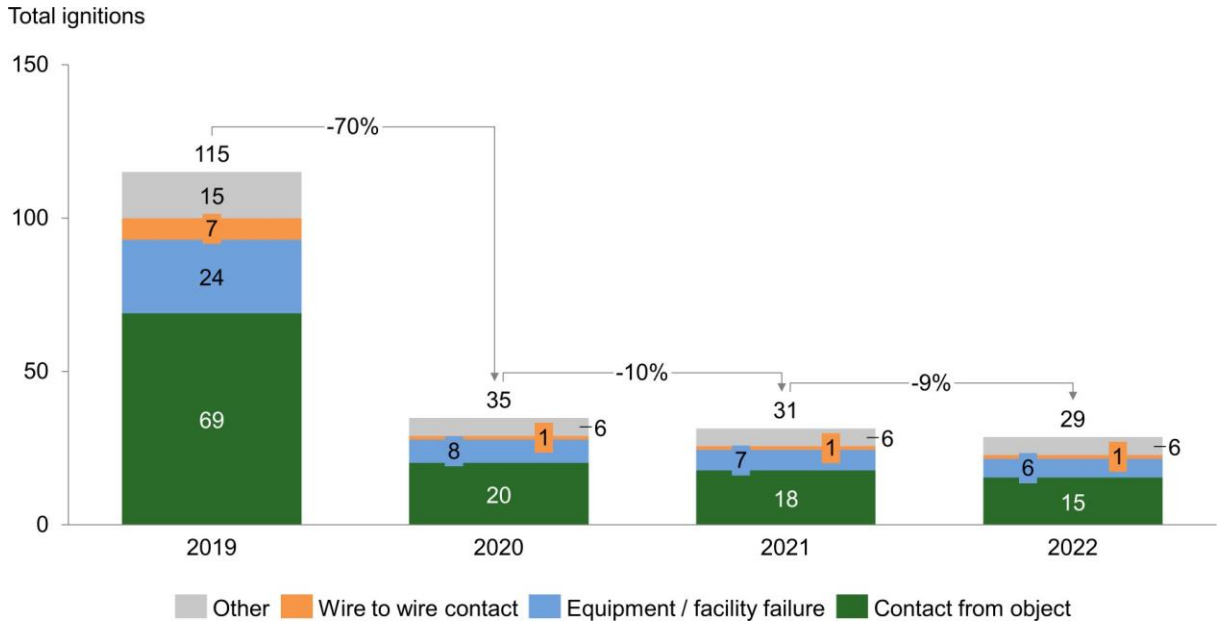


Note: Projections assume WMP implementation according to plan and weather patterns consistent with 5 year historical average. See the 2020 WMP Guidelines for more information on assumptions made.

Source: Tables 11a, 11b, 31a, and 31b from PG&E WMP and data requests

Figure 2.7c: SCE Detail: Actual and projected ignitions for top ignition drivers, 2019 and 2022

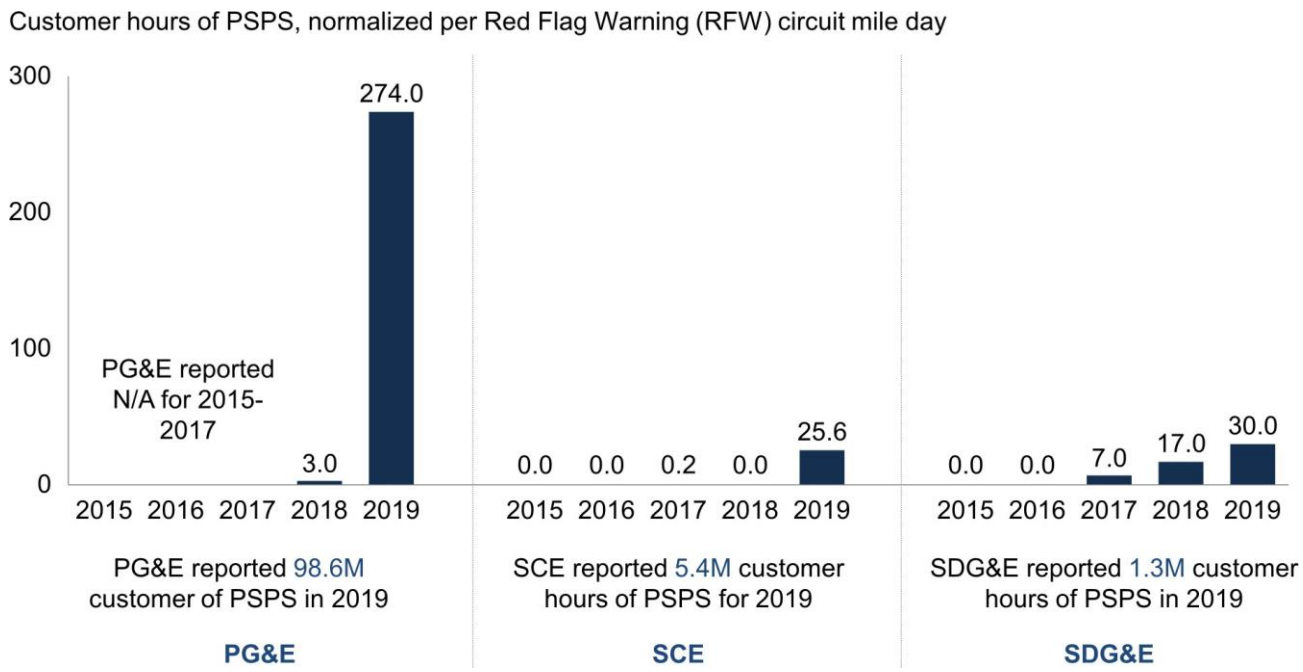
Figure shows reported 2019 ignitions and projected future ignitions by driver category, for transmission and distribution



Source: Tables 11a, 11b, 31a, and 31b from SCE WMP and data requests

Note: Projections assume WMP implementation according to plan and weather patterns consistent with 5 year historical average. See the 2020 WMP Guidelines for more information on assumptions made.

Figure 2.8a: Normalized PSPS duration in customer hours (Large utilities)

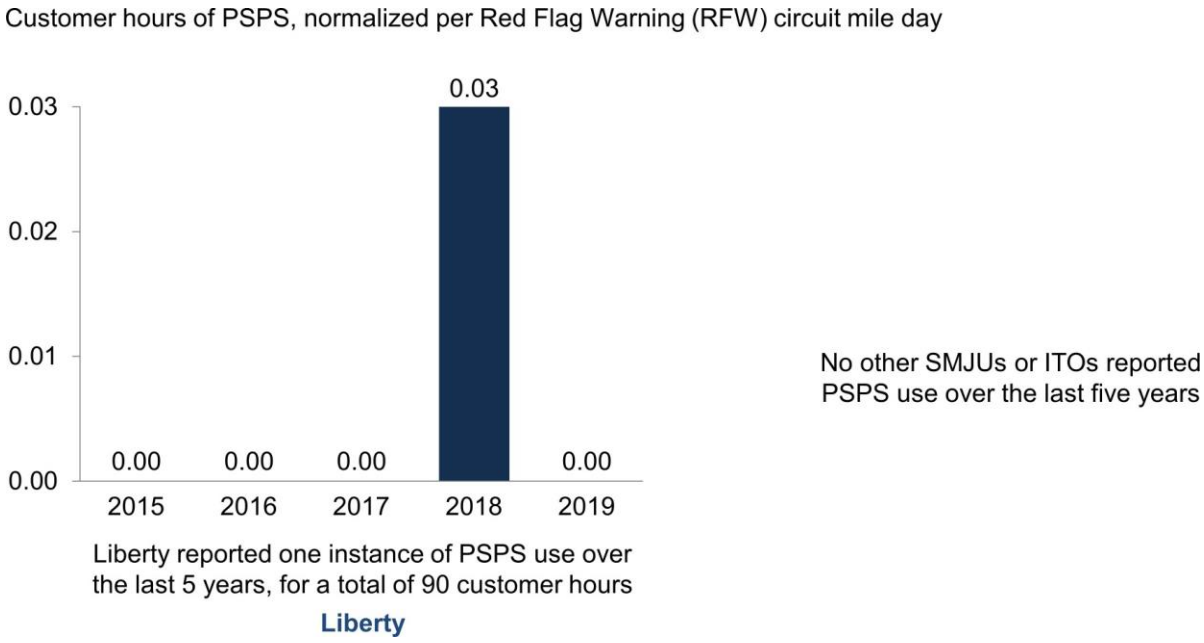


Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric; more detail is necessary to address potential inconsistencies in how each utility calculates this figure. A "Red Flag Warning (RFW) Circuit Mile Day" is intended to capture the duration and scope of the fire weather that year and is calculated as the number of circuit miles that were under a RFW multiplied by the number of days those miles were under said RFW (per page 5 of the 2020 WMP Guidelines). For example, if 100 circuit miles were under a RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW circuit mile days would be 110.

Utilities' ability to implement PSPS (including accurate predictions and customer communication) is captured in the Utility Wildfire Mitigation Maturity Model's "PSPS operating model and consequence mitigation" capability.

Source: Table 12 of utility WMPs.

Figure 2.8b: Normalized PSPS duration in customer hours (Small utilities)

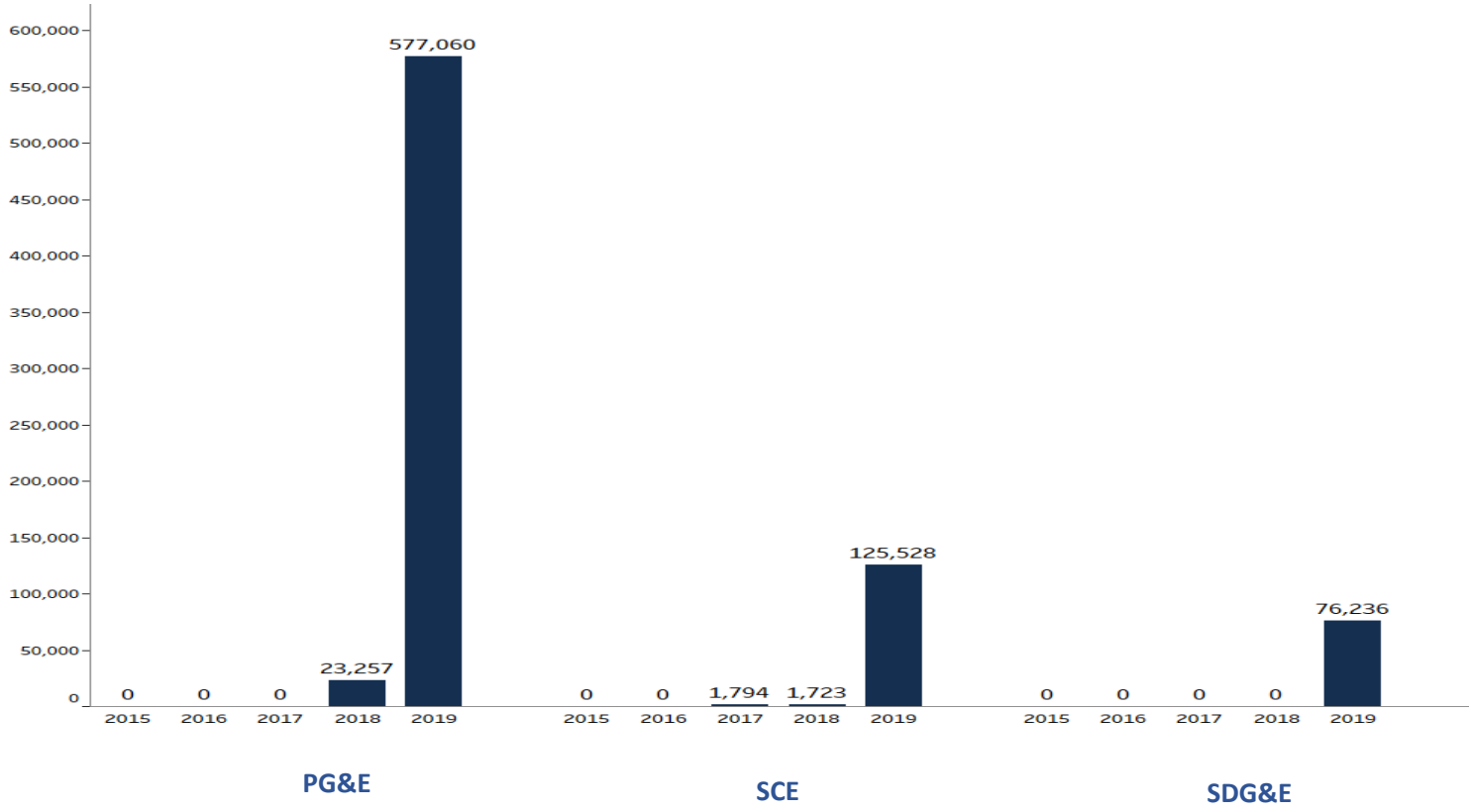


Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric; more detail is necessary to address potential inconsistencies in how each utility calculates this figure. A "Red Flag Warning (RFW) Circuit Mile Day" is intended to capture the duration and scope of the fire weather that year and is calculated as the number of circuit miles that were under a RFW multiplied by the number of days those miles were under said RFW (per page 5 of the 2020 WMP Guidelines). For example, if 100 circuit miles were under a RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW circuit mile days would be 110.

Utilities' ability to implement PSPS (including accurate predictions and customer communication) is captured in the Utility Wildfire Mitigation Maturity Model's "PSPS operating model and consequence mitigation" capability.

Source: Table 12 of utility WMPs.

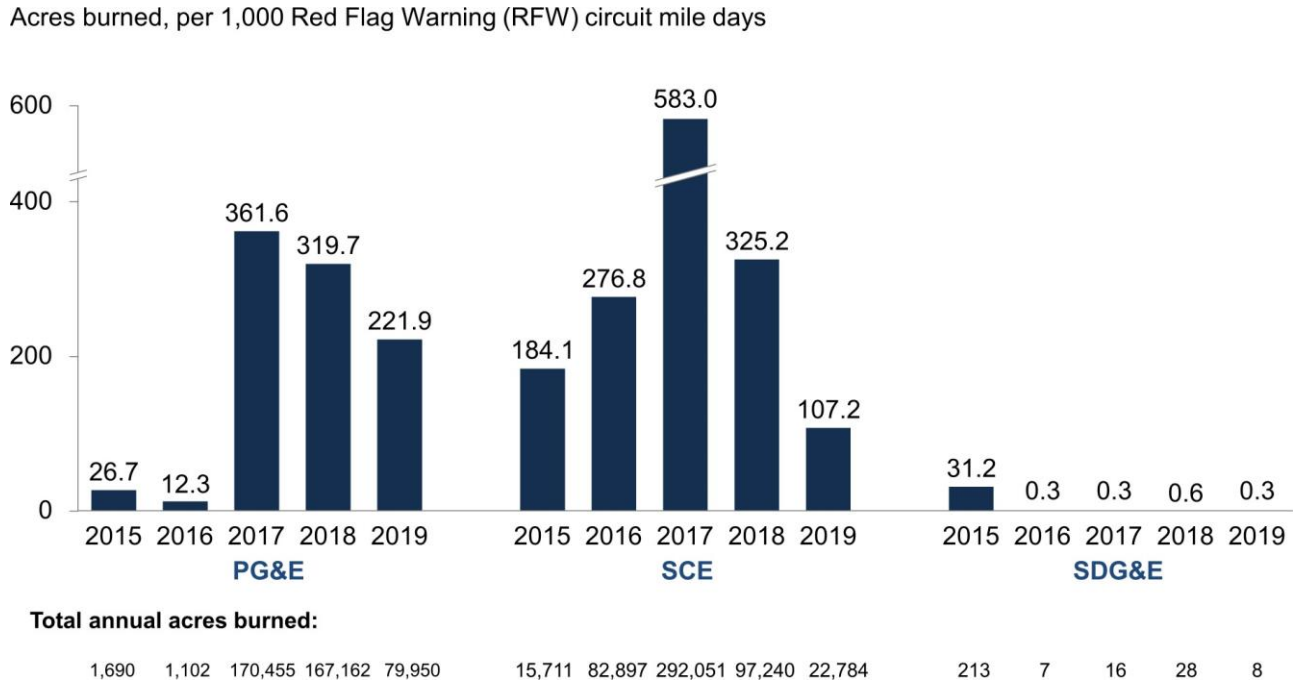
Figure 2.8c: PSPS impacts on critical infrastructure



Note: Count is based on number of critical infrastructure locations impacted per hour multiplied by hours offline per year

Source: Table 2 of utility WMPs

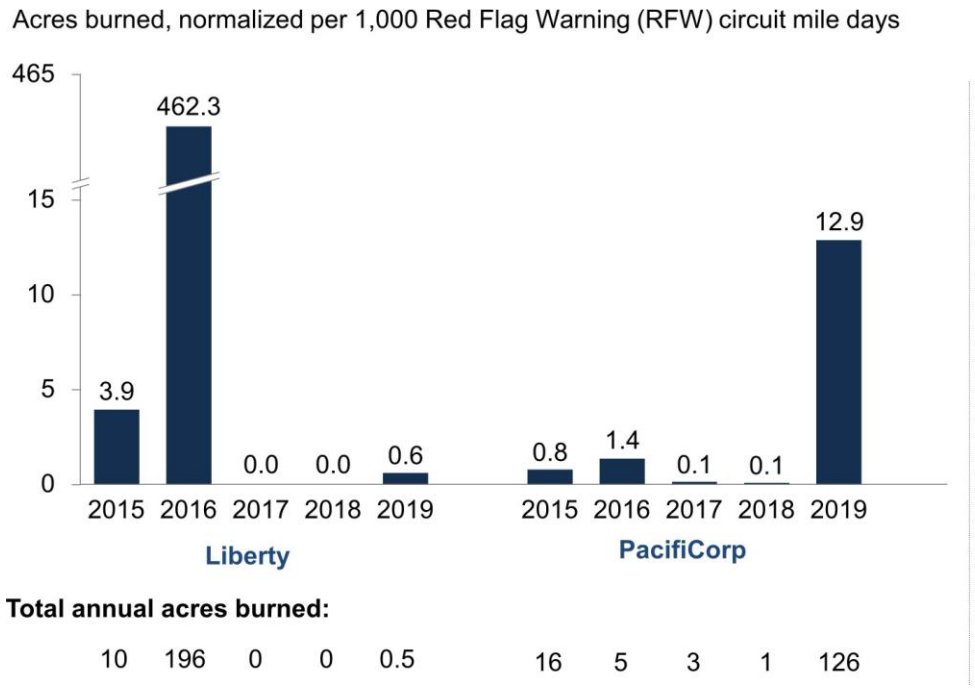
Figure 2.9a: Normalized area burned by utility ignited wildfire (Large utilities)



Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric. A "Red Flag Warning (RFW) Circuit Mile Day" is intended to capture the duration and scope of the fire weather that year. It is defined on page 5 of the 2020 WMP Guidelines to be calculated as the number of circuit miles that were under a RFW multiplied by the number of days those miles were under said RFW. For example, if 100 circuit miles were under a RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW circuit mile days would be 110. To address inconsistencies in how utilities normalized this metric in Table 2 of their WMPs, this table shows number of acres burned as reported in Table 2 normalized by RFW Circuit Mile Days as reported in Table 10.

Source: Table 2 and Table 10 of utility WMPs.

Figure 2.9b: Normalized area burned by utility ignited wildfire (Small utilities)

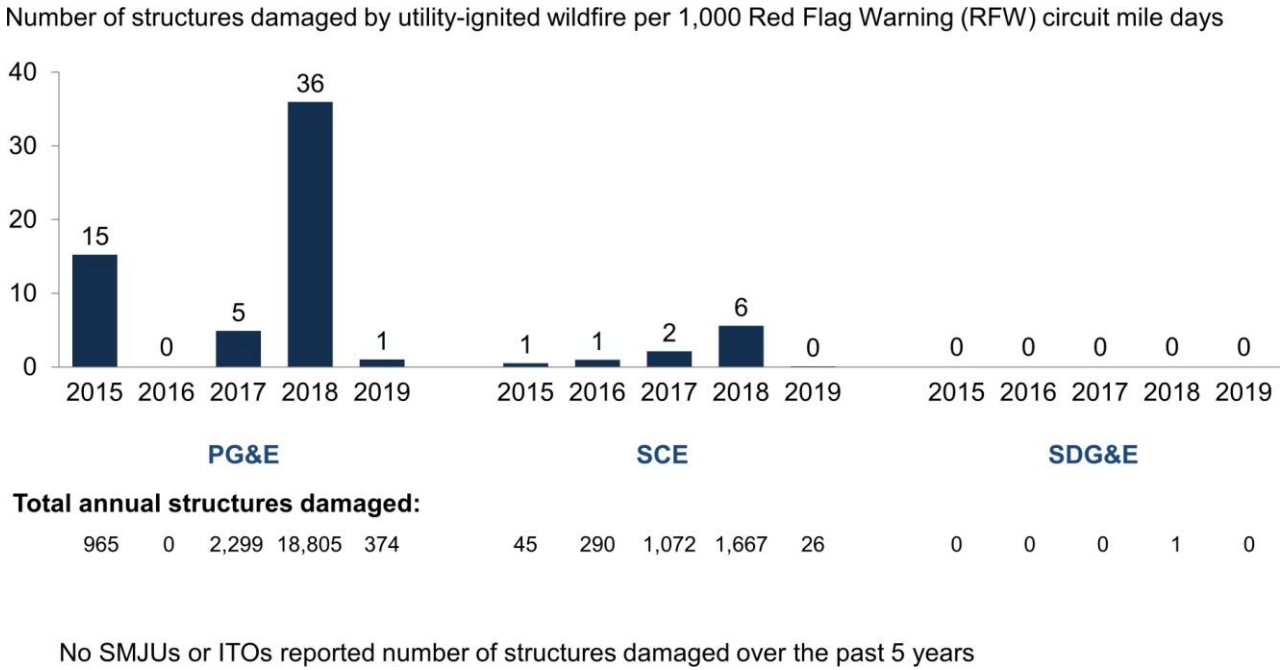


No other SMJUs or ITOs reported any area burned over the last 5 years

Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric. A "Red Flag Warning (RFW) Circuit Mile Day" is intended to capture the duration and scope of the fire weather that year. It is defined on page 5 of the 2020 WMP Guidelines to be calculated as the number of circuit miles that were under a RFW multiplied by the number of days those miles were under said RFW. For example, if 100 circuit miles were under a RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW circuit mile days would be 110. To address inconsistencies in how utilities normalized this metric in Table 2 of their WMPs, this table shows number of acres burned as reported in Table 2 normalized by RFW Circuit Mile Days as reported in Table 10.

Source: Table 2 and Table 10 of utility WMPs.

Figure 2.10: Number of structures damaged by utility ignited wildfire



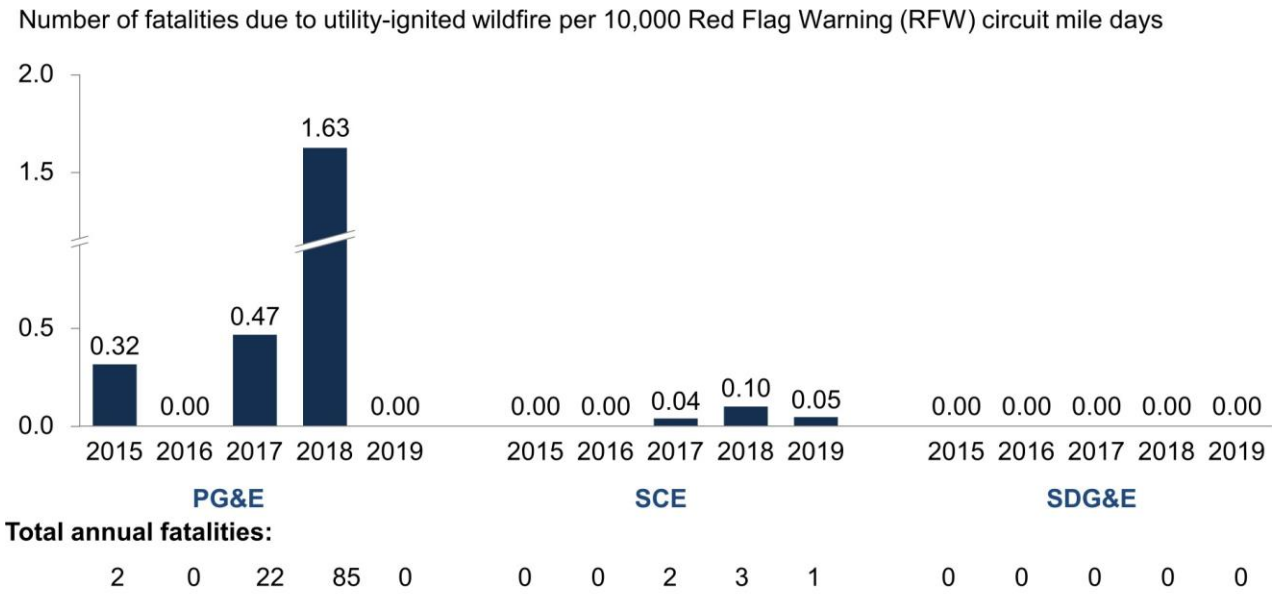
No SMJUs or ITOs reported number of structures damaged over the past 5 years

Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric. A "Red Flag Warning (RFW) Circuit Mile Day" is intended to capture the duration and scope of the fire weather that year. It is defined on page 5 of the 2020 WMP Guidelines to be calculated as the number of circuit miles that were under a RFW multiplied by the number of days those miles were under said RFW. For example, if 100 circuit miles were under a RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW circuit mile days would be 110.

This figure is shown for IOUs only because the smaller utilities did not report structures damaged in a comparable way. PacifiCorp reported the value of assets desroyed, rather than number of structures damaged; Liberty reported no homes destroyed, only 18 utility poles; and no other SMJUs or ITOs reported any structures damaged.

Source: Table 2 of utility WMPs.

Figure 2.11: Fatalities due to utility ignited wildfire



No SMJUs or ITOs reported fatalities due to utility ignited wildfire over the past 5 years

Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric. A "Red Flag Warning (RFW) Circuit Mile Day" is intended to capture the duration and scope of the fire weather that year. It is defined on page 5 of the 2020 WMP Guidelines to be calculated as the number of circuit miles that were under a RFW multiplied by the number of days those miles were under said RFW. For example, if 100 circuit miles were under a RFW for 1 day, and 10 of those miles were under RFW for an additional day, then the total RFW circuit mile days would be 110.

Source: Table 2 of utility WMPs.

1.3 Resource Allocation

Figure 3.1a: Overview of total plan spend across utilities (Large utilities)

		PG&E	SCE	SDG&E
Total spend	2019 planned spend	$2,296M	$671M	$255M
	2019 actual spend	$2,999M	$1,557M	$307M
	2020 planned spend	$3,171M	$1,606M	$444M
	2021 planned spend	$3,130M	$1,404M	$445M
	2022 planned spend	$3,247M	$1,501M	$448M
	Total planned spend as for 2020, 2021 and 2022, as reported by utility	**$9,548M**	**$4,511M**	**$1,336M**[1]
Normalized spend	Total planned spend for 2020, 2021 and 2022 per overhead HFTD circuit mile	$307K	$318K	$291K

1. Totals for SDG&E include a calculation error on the part of SDG&E in which the sum of the reported spend for 2020, 2021, and 2022 is not equal to the reported total 2020-2022 planned spend. This error has not been corrected by the WSD in this table.

Note: "M" stands for millions, "K" stands for thousands.

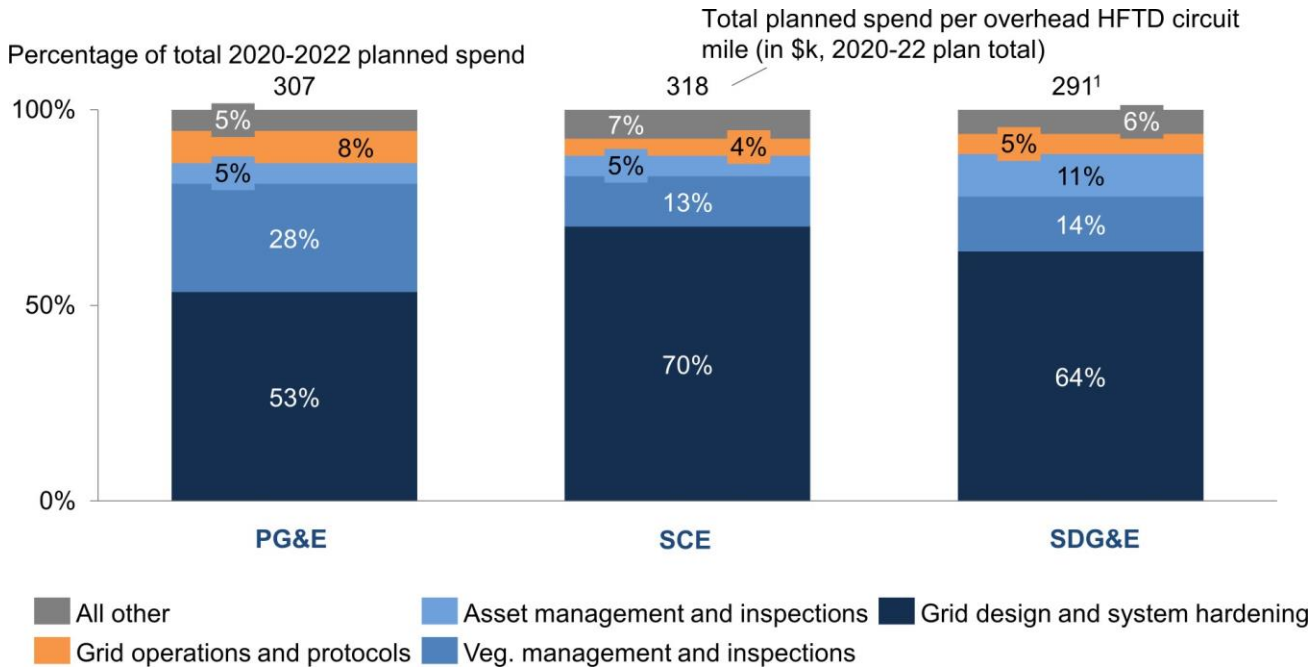
Source: Tables 21-30 from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs

Figure 3.1b: Overview of total plan spend across utilities (Small utilities)

		Liberty	PacifiCorp	Bear Valley(!)[2]	Horizon West	Trans Bay Cable
Total spend	2019 planned spend	$4M	$1M	$12M	$0M	$0M
	2019 actual spend	$7M	$13M	$12M	$0M	$0M
	2020 planned spend	$30M	$26M	$84M	$4M	$0M
	2021 planned spend	$32M	$38M	$79M	$4M	$0M
	2022 planned spend	$27M	$37M	$79M	$0M	$0M
	Total planned spend as for 2020, 2021 and 2022, as reported by utility	**$88K[1]**	**$101M[1]**	**$247M[1]**	**$8M**	**$0M**
Normalized spend	Total planned spend for 2020, 2021 and 2022 per overhead HFTD circuit mile	$63K	$86K	$1,168K	NA – no operational facilities as of WMP submission	$0K

1. Totals for Liberty, PacifiCorp, and Bear Valley include calculation errors on the part of utilities in which the reported sum of the spend for 2020, 2021, and 2022 is not equal to the total reported 2020-2022 planned spend. This error has not been corrected by theWSD in this table.
2. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).
Note: "M" stands for millions, "K" stands for thousands.
Source: Tables 21-30 from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs

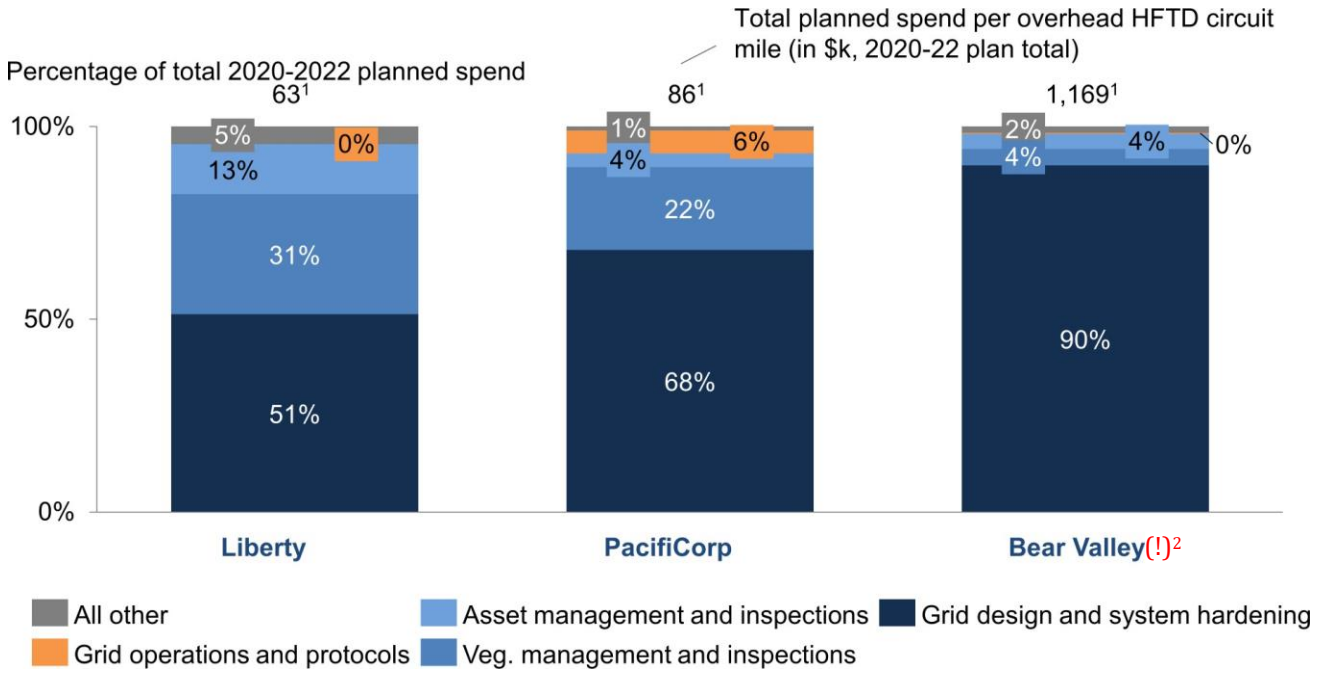
Figure 3.2a: Overview of total plan spend across utilities (Large utilities)



1. Totals for SDG&E include a calculation error on the part of SDG&E which has not been corrected by the WSD in this chart. Specifically, the sum of the reported spend for 2020, 2021, and 2022 is not equal to the reported total 2020-2022 spend as reported by SDG&E.

Source: Tables 21-30 from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs

Figure 3.2b: Overview of total plan spend across utilities (Small utilities)



1. Totals for Liberty, PacifiCorp and Bear Valley include calculation errors on the part of those utilities which have not been corrected by the WSD in this chart. Specifically, the sum of the spend for 2020, 2021, and 2022 is not equal to the total 2020-2022 spend as reported by those utilities.

2. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

Note: Spending for ITOs not shown here. Trans Bay Cable reports no planned spend. Horizon West Transmission (HWT) does not yet have operational facilities but reports up to $8M in planned spending, shown in HWT detailed appendix.

Source: Tables 21-30 from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs

Figure 3.3a: Breakdown of planned spend by category (Large utilities)

Total plan spend is shown for 2020-2022 plan period as calculated by utility

	PG&E		SCE		SDG&E	
Category	**Total plan spend, $M**	**% of total**	**Total plan spend, $M**	**% of total**	**Total plan spend, $M**	**% of total**
Grid design / system hardening	5,102	53%	3,162	70%	853	64%
Vegetation mgt. and inspections	2,645	28%	583	13%	187	14%
Asset mgt. and inspections	499	5%	232	5%	146	11%
Grid operations and protocols	788	8%	198	4%	68[1]	5%
Data governance	177	2%	39	1%	1	0%
Situational awareness and forecasting	140	2%	90	2%	24	2%
Emergency planning and preparedness	114	1%	72	2%	18	1%
Stakeholder cooperation & community engagement	84	1%	0	0%	0	0%
Resource allocation methodology	0	0%	133	3%	26	2%
Risk assessment and mapping	0	0%	0	0%	14	1%
Total plan, 2020-2022	**9,548**	**100%**	**4,511**	**100%**	**1,336**	**100%**

1. SDG&E has reported an incorrect total (reported 2020-2022 total plan spend is not equal to the sum of planned 2020, 2021, and 2022 spend). This error has not been corrected by the WSD in this table.

Source: Tables 21-30 of utility WMPs

Figure 3.3b: Breakdown of planned spend by category (Small utilities)

Total plan spend is shown for 2020-2022 plan period as calculated by utility

	Liberty		PacifiCorp		Bear Valley(!)[2]	
Category	**Total plan spend, $M**	**% of total**	**Total plan spend, $M**	**% of total**	**Total plan spend, $M**	**% of total**
Grid design / system hardening	45	51%	68	68%	222[1]	90%
Vegetation mgt. and inspections	28	31%	22	22%	10	4%
Asset mgt. and inspections	11[1]	13%	4[1]	4%	10	4%
Grid operations and protocols	0	0%	6	6%	1	0%
Data governance	1	2%		0%	0	0%
Situational awareness and forecasting	2	2%	1	1%	4	2%
Emergency planning and preparedness	1	1%	0	0%	0	0%
Stakeholder cooperation & community engagement	0	0%	0	0%	0	0%
Resource allocation methodology	0	0%	0	0%	0	0%
Risk assessment and mapping	0	0%	0	0%	0	0%
Total plan, 2020-2022	**88**	**100%**	**101**	**100%**	**247**	**100%**

1. Totals for Liberty, PacifiCorp, and BVES include calculation errors on the part of utilities where reported 2020-2022 plan total spend is different from the sum of reported spend for 2020, 2021 and 2022. These errors have not been corrected by the WSD in this table.
2. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

Source: Tables 21-30 of utility WMPs

Figure 3.4a: PG&E resource allocation detail for top 5 initiatives by planned spend

Total plan spend is shown for 2020-2022 plan period as calculated by utility

	Initiative	Category	Planned spend, $M						Initiative spend as percent of total planned spend
			2019 plan	2019 actual	2020 plan	2021 plan	2022 plan	2020-2022 plan total	
1	17-1. Updates to grid topology to minimize risk of ignition in HFTDs - System Hardening, Distribution	Grid design and system hardening	229	287	367	566	698	1,631	17%
2	15. Remediation of at-risk species - Enhanced Vegetation Management	Vegetation management and inspections	295	424	449	463	477	1,388	15%
3	15. Transmission tower maintenance and replacement	Grid design and system hardening	444	750	297	305	312	914	10%
4	6. Distribution pole replacement and reinforcement, including with composite poles	Grid design and system hardening	255	109	212	218	223	654	7%
5	12-4. Other corrective action - Distribution	Grid design and system hardening	322	167	200	205	210	614	6%
Total spend for top 5 initiatives by planned spend			**1,545**	**1,738**	**1,525**	**1,756**	**1,920**	**5,201**	**54%**

Source: Tables 21-30 of utility WMP

Figure 3.4b: PG&E resource allocation detail for top 4 categories by planned spend

Total plan spend is shown for 2020-2022 plan period as calculated by utility

Category	Total Category Planned Spend	Category spend as percent of total planned spend	Top 3 initiatives by planned spend in category Initiative names as reported in WMP	Initiative spend as percent of total planned spend
Grid design and system hardening	$5.1B	53%	17-1. System Hardening, Distribution	17%
			15. Transmission tower maintenance and replacement	10%
			6. Distribution pole replacement and reinforcement, including with composite poles	7%
Vegetation management and inspections	$2.6B	28%	15. Remediation of at-risk species-Enhanced Veg Mgt.	15%
			2. Detailed inspections of vegetation-Distribution	6%
			9. Other discretionary inspection of veg. around distribution lines and equipment, beyond those required by regulations	3%
Asset management of inspections	$499M	5%	1. Detailed inspections of distribution electric lines/equip.	3%
			2. Detailed inspections of transmission electric lines/equip.	2%
			15-1 Substation inspections - Transmission Substation	0%
Grid operations and protocols	$788M	8%	5-1. PSPS events and mitigation of PSPS impacts-Distribution	4%
			5-3. PSPS events and mitigation of PSPS impacts - Additional PSPS Mitigation Initiatives, Distribution	2%
			2. Crew-accompanying ignition prevention and suppression resources and services	1%

Note: "M" stands for millions, "B" stands for billions.

Source: Tables 21-30 of utility WMP

Figure 3.5a: SCE resource allocation detail for top 5 initiatives by planned spend

Total plan spend is shown for 2020-2022 plan period as calculated by utility

	Initiative	Category	Planned spend, $M						Initiative spend as percent of total planned spend
			2019 plan	2019 actual	2020 plan	2021 plan	2022 plan	2020-2022 plan total	
1	3.1. Covered conductor installation: covered conductor (SH-1)	Grid design and system hardening	42	240	454	656	772	1,883	42%
2	12.1. Other corrective action: distribution remediation (SH-12.1)	Grid design and system hardening	192	395	328	125	85	538	12%
3	20. Vegetation management to achieve clearances around electric lines and equipment	Vegetation management and inspections	76	247	76	64	61	201	4%
4	6.1. Distribution pole replacement and reinforcement, including with composite poles: composite poles and crossarms (SH-3)	Grid design and system hardening	5	Reported as "NA" - part of 3.1	57	64	74	194	4%
5	16.1. Removal and remediation of trees with strike potential to electric lines and equipment: hazard tree (VM-1)	Vegetation management and inspections	57	15	54	59	72	186	4%
Total spend for top 5 initiatives by planned spend			**372**	**897**	**969**	**969**	**1063**	**3002**	**67%**

Source: Tables 21-30 of utility WMP

Figure 3.5b: SCE resource allocation detail for top 4 categories by planned spend

Total plan spend is shown for 2020-2022 plan period as calculated by utility

Category	Total Category Planned Spend	Category spend as percent of total planned spend	Top 3 initiatives by planned spend Initiative names in some cases abbreviated to fit in this table	Initiative spend as percent of total plan spend
Grid design and system hardening	$3.1B	70%	3.1. Covered conductor installation: covered conductor	42%
			12.1. Other corrective action: Distribution remediation	12%
			6.1. Distribution pole replacement and reinforcement, including with composite poles: Composite poles and crossarms	4%
Vegetation management and inspections	$583M	13%	20. Vegetation management to achieve clearances around electric lines and equipment	4%
			16.1. Removal and remediation of trees with strike potential to electric lines and equipment: Hazard tree	4%
			16.2. Removal and remediation of trees with strike potential to electric lines and equipment: DRI quarterly inspections and tree removals	2%
Asset management of inspections	$232M	5%	9.2. Distribution aerial inspections	2%
			15. Substation inspections	1%
			10.2. Transmission aerial inspections	1%
Grid operations and protocols	$198M	4%	5.8. PSPS events and mitigation of PSPS impacts: SGIP resiliency	3%
			5. PSPS events and mitigation of PSPS impacts	0%
			5.3. PSPS events and mitigation of PSPS impacts: income qualified critical care (IQCC) customer battery backup incentive program	0%

Source: Tables 21-30 of utility WMP

Figure 3.6a: SDG&E resource allocation detail for top 5 initiatives by planned spend

Total plan spend is shown for 2020-2022 plan period as calculated by utility

	Initiative	Category	Planned spend, $M						Initiative spend as percent of total plan spend
			2019 plan	2019 actual	2020 plan	2021 plan	2022 plan	2020-2022 plan total	
1	Undergrounding of Electric Lines and/or Equipment	Grid design and system hardening	2	5	31	157	188	376	28%
2	Distribution Overhead Fire Hardening (OH)	Grid design and system hardening	75	121	87	12	7	106	8%
3	LTE Communication Network	Grid design and system hardening	11	7	32	32	42	105	8%
4	Tree Trimming	Vegetation management and inspections	Not provided[1]	34	28	28	28	83	6%
5	Drone Inspections (O&M) – Engr and construction	Asset management and inspections	Listed "NA"	Listed "NA"	27	24	20	71	5%
Total spend for top 5 initiatives by planned spend			**88**	**166**	**204**	**253**	**284**	**741**	**55%**

1. Incorporated into 2019 base costs.

Source: Tables 21-30 of utility WMP

Figure 3.6b: SDG&E resource allocation detail for top 4 categories by planned spend

Total plan spend is shown for 2020-2022 plan period as calculated by utility

Category	Total Category Planned Spend	Category spend as percent of total planned spend	Top 3 initiatives by planned spend Initiative names as reported in WMP	Initiative spend as percent of total planned spend
Grid design and system hardening	$853M	64%	Undergrounding of Electric Lines and/or Equipment	28%
			Distribution Overhead Fire Hardening (OH)	8%
			LTE Communication Network	8%
Vegetation management and inspections	$187M	14%	Tree Trimming	6%
			Enhanced Inspections Patrols and Trimming	5%
			Pole Brushing	1%
Asset management of inspections	$146M	11%	Drone Inspections (O&M) *Engineering & Construction	5%
			Drone Inspections (O&M) *Flights & Assessments	4%
			Drone Inspections (capital)	1%
Grid operations and protocols	$68M	5%	Aviation Firefighting Program (O&M)	2%
			Aviation Firefighting Program (Capital)	2%
			Communication Practices (O&M)[1]	1%

1. Totals for SDG&E include a calculation error on the part of SDG&E in which the sum of the reported spend for 2020, 2021, and 2022 is not equal to the reported total 2020-2022 planned spend. This error has not been corrected by the WSD in this table.

Note: "M" stands for millions

Source: Tables 21-30 of utility WMP

Figure 3.7: Liberty resource allocation detail for top 5 initiatives by planned spend

Total plan spend is shown for 2020-2022 plan period as calculated by utility

	Initiative	Category	Planned spend, $M						Initiative spend as percent of total plan spend
			2019 plan	2019 actual	2020 plan	2021 plan	2022 plan	2020-2022 plan total	
1	Covered Conductor Installation	Grid design and system hardening	1	1	3	8	10	21	24%
2	Remediation of at-risk-species	Vegetation management and inspections	0	5	5	5	5	14	16%
3	13. Pole loading infrastructure hardening and replacement program based on pole loading assessment program	Grid design and system hardening	1	1	2	3	4	8	9%
4	Undergrounding electric lines and/or equipment	Grid design and system hardening	0	0	2	6	0	8	9%
5	Fuel management and reduction of "slash" from vegetation management activities	Vegetation management and inspections	0	0	2	3	3	7	8%
Total spend for top 5 initiatives by planned spend			**2**	**6**	**13**	**24**	**21**	**58**	**66%**

Note: "M" stands for millions.

Source: Tables 21-30 of utility WMP

Figure 3.8: PacifiCorp resource allocation detail for top 5 initiatives by planned spend

Total plan spend is shown for 2020-2022 plan period as calculated by utility

	Initiative	Category	Planned spend, $M						Initiative spend as percent of total plan spend
			2019 plan	2019 actual	2020 plan	2021 plan	2022 plan	2020-2022 plan total	
1	3b. Covered conductor installation - distribution	Grid design and system hardening	0	0	8	11	12	31	31%
2	6b. Transmission pole replacement and reinforcement, including with composite poles	Grid design and system hardening	0	0	4	4	4	12	12%
3	3. Covered conductor installation - transmission	Grid design and system hardening	0	0	0	6	6	12	12%
4	20. Vegetation management to achieve clearances around electric lines and equipment	Vegetation management and inspections	0	4	3	3	3	10	10%
5	6. Distribution pole replacement and reinforcement, including with composite poles	Grid design and system hardening	0	0	0	3	3	5	5%
Total spend for top 5 initiatives by planned spend			**0**	**4**	**15**	**27**	**28**	**70**	**70%**

Note: "M" stands for millions.

Source: Tables 21-30 of utility WMP

Figure 3.9: Bear Valley resource allocation detail for top 5 initiatives by planned spend(!)[1]

Total plan spend is shown for 2020-2022 plan period as calculated by utility

	Initiative	Category	Planned spend, $M						Initiative spend as percent of total plan spend
			2019 plan	2019 actual	2020 plan	2021 plan	2022 plan	2020-2022 plan total	
1	16. Undergrounding of electric lines and/or equipment (35 kV system)	Grid design and system hardening	0	0	39	39	39	118	27%
2	16. Undergrounding of electric lines and/or equipment (4 kV system)	Grid design and system hardening	0	0	13	13	13	40	9%
3	18. Other / not listed (Covering overhead conductor)	Grid design and system hardening	0	0	4	4	4	11	2%
4	2. Detailed inspections of vegetation around distribution electric lines and equipment	Vegetation management and inspections	3	3	3	3	3	10	2%
5	20. Other / not listed (energy storage facility)	Grid design and system hardening	0	0	0	5	5	9	2%
Total spend for top 5 initiatives by planned spend			**3**	**3**	**59**	**64**	**64**	**187**	**43%**

1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

Note: "M" stands for millions.

Source: Tables 21-30 of utility WMP

Figure 3.10: Horizon West Transmission allocation detail for all planned initiatives

Total plan spend is shown for 2020-2022 plan period as calculated by utility. Horizon West reported only four initiatives with allocated spend

	Upper range[1] of planned spend, $M						
Initiative	2019 plan	2019 actual	2020 plan	2021 plan	2022 plan	2020-2022 plan total	**Initiative spend as percent of total plan spend**
SVC Site Hardening	0.00	0.00	2.20	4.30	0.00	6.50	77%
Underground of 115 feet of overhead line	0.00	0.00	1.70	0.00	0.00	1.70	20%
Advanced weather monitoring, weather stations and OH line/pole cameras	0.00	0.00	0.15	0.00	0.00	0.15	2%
Inspections (Training, facility, vegetation, and fuel modification)	0.00	0.00	0.04	0.04	0.04	0.11	1%
Total 2020-2022 planned spend	**0.00**	**0.00**	**4.09**	**4.34**	**0.04**	**8.46**	**100%**

1. For some initiatives, Horizon West reported a range of possible future spend. The higher number in that reported range is displayed in this table.

Note: "M" stands for millions.

Source: Tables 21-30 of utility WMP

(End of Appendix B)

APPENDIX C

SDG&E Maturity Model Summary

0. SDG&E: Description of Data Sources

Data related to the Maturity Model is based on the latest submitted versions of 2020 Utility Wildfire Mitigation Maturity Survey ("Survey") as of April 10th, 2020. Data for the Maturity Model is pulled from Survey responses unless stated otherwise.

All source data (the WMP and the Survey responses) are available at cpuc.ca.gov/wildfiremitigationplans

All the analysis and corresponding tables presented in this appendix rely upon data that is self-reported by the utilities. By utilizing and presenting this self-reported data in this appendix, the WSD is not independently validating that all data elements submitted by utilities are accurate. The WSD will continue to evaluate utility data, conduct data requests, and conduct additional compliance activities to ensure that data provided is accurate.

1. SDG&E: Maturity Model Summary

Contents

1.1 SDG&E: Maturity Summary by Category

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020-2022 WMP period
A. Risk assessment and mapping Median automated maturity levels: 2020: 2 2023: 2	• SDG&E plans to increase its maturity level by 2023 in two of five capabilities. Specifically, by capability: • **1. Climate Scenario Modeling**: SDG&E's survey responses do not indicate an increased maturity level in 2023. However, SDG&E projects some growth within the capability: Currently scenario modeling uses basic temperature modeling when accounting for climate change, but by 2023 SDG&E plans to also account for changes in geography, vegetation, and extreme weather caused by climate change. • **2. Ignition Risk Estimation:** SDG&E's survey responses do not indicate an increased maturity level in 2023. However, SDG&E projects some growth within the capability: Currently SDG&E estimates ignition risk with a <80% confidence interval, but by 2023 SDG&E plans to use a >80% confidence interval. • **3. Estimation of Wildfire Consequences for Communities:** SDG&E's survey responses do not indicate an increased maturity level in 2023. However, SDG&E projects some growth within the capability: Currently estimates of wildfire consequences are independently assessed by experts, but by 2023 SDG&E also plans to confirm estimates with real time learning (e.g., machine learning). • **4. Estimation of wildfire and PSPS risk-reduction impact:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, estimation of wildfire and PSPS reduction impact is done at the regional level, and outputs are assessed by experts. By 2023, SDG&E plans to estimate wildfire and PSPS reduction impact with circuit-level granularity, and to assess estimates using historical data of incidents and near misses. • **5. Risk maps and simulation algorithms**: SDG&E's survey responses indicate an increased maturity level in 2023. Currently, the decision to update algorithms is made using internal data. By 2023, SDG&E plans to also use historical data, as well as data from other utilities and other sources, when making this decision.
B. Situational awareness and forecasting Median automated maturity levels: 2020: 3 2023: 3	• SDG&E plans to increase its maturity level by 2023 in zero of five capabilities. Specifically, by capability: • **6. Weather variables collected:** SDG&E's survey responses project no growth in this capability. SDG&E collects a range of weather variables from multiple sources to forecast and model weather. • **7. Weather data resolution:** SDG&E's survey responses project no growth in this capability. Weather data is collected automatically six times an hour and is resolved at the span-level. • **8. Weather forecasting ability:** SDG&E's survey responses do not indicate an increased maturity level in 2023. However, SDG&E projects some growth within the capability: Currently SDG&E uses a combination

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020-2022 WMP period
	of weather stations and external data to make forecasts, but by 2023 SDG&E plans to also adjust weather forecasts in real time based on learning algorithms and updated inputs. • **9. External sources used in weather forecasting:** SDG&E's survey responses do not indicate an increased maturity level in 2023. However, SDG&E projects some growth within the capability: Currently, SDG&E uses weather data to produce a combined weather map to inform decisions, but by 2023 SDG&E plans to use a single visual and configurable live map. • **10. Wildfire detection processes and capabilities:** SDG&E's survey responses do not indicate an increased maturity level in 2023. However, SDG&E projects some growth within the capability: Currently, SDG&E uses cameras for detecting ignitions along the grid, but by 2023 SDG&E plans to also use satellite monitoring to detect these ignitions.
C. Grid design and system hardening Median automated maturity levels: 2020: 2 2023: 4	• SDG&E plans to increase its maturity level by 2023 in four of five capabilities. Specifically, by capability: • **11. Approach to prioritizing initiatives across territory:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E prioritizes initiatives based on risk modeling and detailed wildfire / PSPS risk simulations. By 2023 SDG&E plans to also take power delivery uptime into account when prioritizing grid hardening initiatives. • **12. Grid design for minimizing ignition risk:** SDG&E's survey responses do not indicate an increased maturity level in 2023. However, SDG&E projects some growth within the capability: Currently, SDG&E makes some efforts to incorporate asset management strategies and technologies into HFTD areas, but by 2023 SDG&E plans to make these efforts across the grid. • **13. Grid design for resiliency and minimizing PSPS:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E's distribution architecture has (n-1) redundancy covering at least 50% of customers in HFTD. By 2023, SDG&E plans to increase this number to 70%. • **14. Risk based hardening and cost efficiency:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently SDG&E estimates the effects and costs of risk based grid hardening initiatives at the regional level. By 2023 SDG&E plans to do this at the circuit-level. • **15. Grid design and asset innovation:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, new grid hardening initiatives are evaluated based on installation into grid and measurement of direct reduction in ignition events and near-miss metrics. By 2023, SDG&E plans to also independently evaluate initiatives before installation, and audit performance after installation.

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020-2022 WMP period
D. Asset management and inspections Median automated maturity levels: 2020: 2 2023: 2	• SDG&E plans to increase its maturity level by 2023 in one of five capabilities. Specifically, by capability: • **16. Asset inventory and condition assessments:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, there is an accurate inventory of equipment that may contribute to wildfire risk. By 2023, SDG&E plans to include records of all inspections / repairs that are independently audited in this inventory, as well as to update condition of assets monthly. • **17. Asset inspection cycle:** SDG&E's survey responses project no growth in this capability. Inspections are above minimum regulatory requirements, with more frequent inspections for the highest risk equipment. • **18. Asset inspection effectiveness:** SDG&E's survey responses project no growth in this capability. Inspection procedures and checklists include all items required by statute and regulations. • **19. Asset maintenance and repair:** SDG&E's survey responses do not indicate an increased maturity level in 2023. However, SDG&E projects some growth within the capability: Currently, service intervals are set based on wildfire risk in relevant area, but by 2023, service intervals are planned to be set based on wildfire risk in relevant circuit. • **20. QA/QC for asset management:** SDG&E's survey responses project no growth in this capability. SDG&E manages and confirms contractor activity through an established and functioning audit process.
E. Vegetation management and inspections Median automated maturity levels: 2020: 2.5 2023: 3.5	• SDG&E plans to increase its maturity level by 2023 in four of six capabilities. Specifically, by capability: • **21. Vegetation inventory and condition assessments:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E has a centralized inventory of vegetation clearances. By 2023, it plans to include up-to-date tree health and moisture content in this inventory. • **22. Vegetation inspection cycle**: SDG&E's survey responses indicate an increased maturity level in 2023. Currently, vegetation inspection scheduling is based on static maps of vegetation and environment. By 2023, SDG&E plans for inspection schedules to be determined by predictive modeling. • **23. Vegetation inspection effectiveness**: SDG&E's survey responses project no growth in this capability. SDG&E's inspection procedures and checklists are in line with statutory and regulatory guidelines. • **24. Vegetation grow-in mitigation**: SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E does not use advanced modeling to guide clearances around lines and equipment. By 2023, SDG&E plans to use more advanced modeling (ignition risk, limb failure, local climate) to guide clearances around lines and equipment. • **25. Vegetation fall-in mitigation**: SDG&E's survey responses project no growth in this capability. SDG&E has a systematic way of removing vegetation outside of right of way that includes informing relevant communities of removal.

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020-2022 WMP period
	• **26. QA/QC for vegetation management**: SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E has a functioning audit process to manage and confirm subcontractor work. By 2023, SDG&E plans to use audit technologies to partially automate this process.
F. Grid operations and protocols Median automated maturity levels: 2020: 2.5 2023: 2.5	• SDG&E plans to increase its maturity level by 2023 in one of six capabilities. Specifically, by capability: • **27. Protective equipment and device settings**: SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E uses a partially automated process to adjust sensitivity of grid elements and evaluate effectiveness. By 2023, SDG&E plans to use a fully automated process for this. • **28**. **Incorporating ignition risk factors in grid control:** SDG&E's survey responses project no growth in this capability. SDG&E has a clearly explained process for determining whether to operate the grid beyond current or voltage designs. • **29. PSPS op. model and consequence mitigation:** SDG&E's survey responses project no growth in this capability. SDG&E forecasts PSPS events relatively accurately and effectively communicates details to affected customers. • **30. Protocols for PSPS initiation:** SDG&E's survey responses project no growth in this capability. SDG&E has explicit polices and explanation for thresholds above which PSPS is activated as a measure of last resort. • **31. Protocols for PSPS re-energization:** SDG&E's survey responses do not indicate an increased maturity level in 2023. However, SDG&E projects some growth within the capability: Currently SDG&E has some probability estimates for ignitions after PSPS events, but by 2023 SDG&E plans to have an accurate quantitative understanding of these risks. • **32. Ignition prevention and suppression:** SDG&E's survey responses project no growth in this capability. SDG&E has explicit policies about the role of crews at the site of ignition.
G. Data Governance Median automated maturity levels: 2020: 4 2023: 4	• SDG&E plans to increase its maturity level by 2023 in one of four capabilities. Specifically, by capability: • **33. Data collection and curation**: SDG&E's survey responses project no growth in this capability. SDG&E has a centralized database of situational, operational, and risk data. • **34. Data transparency and analytics:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E does not have a single document cataloguing all fire-related data, algorithms, analyses, and data process. By 2023, SDG&E plans to have one, and the document will include explanation of sources, assumptions, and documentation of analyses. • **35. Near-miss tracking:** SDG&E's survey responses project no growth in this capability. SDG&E tracks near miss data for all near misses with wildfire ignition potential.

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020-2022 WMP period
	• **36. Data sharing with research community:** SDG&E's survey responses project no growth in this capability. SDG&E makes data disclosures beyond what is required.
H. Resource allocation methodology Median automated maturity levels: 2020: 1 2023: 2	• SDG&E plans to increase its maturity level by 2023 in four of six capabilities. Specifically, by capability: • **37. Scenario analysis across different risk levels**: SDG&E's survey responses do not indicate an increased maturity level in 2023. However, SDG&E projects some growth within the capability: Currently, SDG&E provides risk projections for each scenario at the region level, but by 2023 it plans to provide projections at the circuit level. • **38. Presentation of relative risk spend efficiency (RSE) for portfolio of initiatives:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E provides RSE figures for portfolio initiatives at the region-level. By 2023, SDG&E plans to provide these figures at the circuit-level. • **39. Process for determining risk spend efficiency of vegetation management initiatives:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E provides risk spend efficiency (RSE) figures for vegetation management initiatives at the region-level. By 2023, SDG&E plans to provide these figures at the circuit-level. • **40. Process for determining risk spend efficiency of system hardening initiatives:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E provides risk spend efficiency (RSE) figures for grid hardening initiatives at the region-level. By 2023, SDG&E plans to provide these figures at the circuit-level. • **41. Portfolio-wide initiative allocation methodology:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E considers RSE when allocating capital. By 2023, SDG&E plans to consider RSE estimates for all initiatives to determine capital allocation across portfolio. • **42. Portfolio-wide innovation in new wildfire initiatives:** SDG&E's survey responses do not indicate an increased maturity level in 2023. However, SDG&E projects some growth within the capability: Currently, reviews of innovative initiatives are not audited, but by 2023 they are planned to be audited by third parties.
I. Emergency planning and preparedness Median automated maturity levels: 2020: 4	• SDG&E plans to increase its maturity level by 2023 in zero of five capabilities. Specifically, by capability: • **43. Wildfire plan integrated with overall disaster/emergency plan**: SDG&E's survey responses project no growth in this capability. SDG&E's wildfire plan is an integrated component of overall disaster and emergency plans. • **44. Plan to restore service after wildfire related outages:** SDG&E's survey responses project no growth in this capability. SDG&E has procedures in place to restore service after a wildfire related outage.

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020-2022 WMP period
2023: 4	• **45. Emergency community engagement during and after wildfire:** SDG&E's survey responses project no growth in this capability. SDG&E provides clear and complete communication of available information to affected customers and refers them to other emergency management resources. • **46. Protocols in place to learn from wildfire events:** SDG&E's survey responses project no growth in this capability. SDG&E has a protocol in place to record the outcome of emergency events and learn from them. • **47. Processes for continuous improvement after wildfire and PSPS:** SDG&E's survey responses project no growth in this capability. SDG&E has a process for improvement after wildfires or PSPS events.
J. Stakeholder cooperation and community engagement Median automated maturity levels: 2020: 4 2023: 4	• SDG&E plans to increase its maturity level by 2023 in one of five capabilities. Specifically, by capability: • **48. Cooperation and best practice sharing with other utilities**: SDG&E's survey responses project no growth in this capability. SDG&E works to identify and incorporate best practices from global utilities. • **49**. **Engagement with communities on utility wildfire mitigation initiatives:** SDG&E's survey responses project no growth in this capability. SDG&E has a clear plan to develop and maintain a collaborative relationship with local communities. • **50. Engagement with LEP[1] and AFN[2] populations:** SDG&E's survey responses project no growth in this capability. SDG&E proactively engages with LEP and AFN communities to mitigate wildfire / PSPS risk specific to them. • **51. Collaboration with emergency response agencies:** SDG&E's survey responses project no growth in this capability. SDG&E works with suppression agencies to identify and respond to ignition events. • **52. Collaboration on wildfire mitigation plan with stakeholders:** SDG&E's survey responses indicate an increased maturity level in 2023. Currently, SDG&E conducts fuel management only along rights of way. By 2023, SDG&E plans to conduct fuel management throughout its service area. 1. Limited English Proficiency 2. Access and Functional Needs

1.2 SDG&E: Maturity Detail by Capability

1.2.1 A. Risk assessment and mapping

1.2.1.1 Capability 1: Climate scenario modeling

Capability 1: Climate scenario modeling		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Risk for various weather scenarios can be reliably estimated b. Scenarios are assessed by independent experts, and supported by historical data of incidents and near misses c. Climate scenario modeling is done at the asset-level d. Climate scenario modeling tool is mostly (>=50%) automated e. Climate scenario tool also accounts for circuit-level weather, how weather effects failure modes and propagation, existing hardware, and level of vegetation f. Basic temperature modeling is used to estimate effects of a changing climate on future weather and risk, taking into account differences in geography and vegetation	a. Risk for various weather scenarios is planned to be reliably estimated b. Scenarios are planned to be assessed by independent experts, and supported by historical data of incidents and near misses c. Climate scenario modeling is planned to be done at the asset-level d. Climate scenario modeling tool is planned to be mostly (>=50%) automated e. Climate scenario tool is also planned to account for circuit-level weather, how weather effects failure modes and propagation, existing hardware, and level of vegetation **f. Modeling with multiple scenarios is planned to be used to estimate effects of a changing climate on future weather and risk, taking into account differences in geography and vegetation, and considering increase in extreme weather event frequency**

Capability 1: Climate scenario modeling		
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.1.2 Capability 2: Ignition risk estimation

Capability 2: Ignition risk estimation				
Automated maturity levels based on Maturity Rubric			**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend			Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
2020	2023	Both		
4			a. Tools and processes can quantitatively and accurately assess the risk of ignition across the grid based on characteristics and condition of lines, equipment, surrounding vegetation, localized weather patterns, and flying debris probability, with probabilities based on specific failure modes and top contributors to those failure modes b. Ignition risk estimation tool is mostly (>=50%) automated c. Ignition risk estimation tool has asset-based granularity d. Ignition risk estimation is confirmed by experts, historical data, and through real-time learning e. Ignition risk estimation uses >60% or no quantified confidence interval	a. Tools and processes are planned to be able to quantitatively and accurately assess the risk of ignition across the grid based on characteristics and condition of lines, equipment, surrounding vegetation, localized weather patterns, and flying debris probability, with probabilities based on specific failure modes and top contributors to those failure modes b. Ignition risk estimation tool is planned to be mostly (>=50%) automated c. Ignition risk estimation tool is planned to have asset-based granularity d. Ignition risk estimation is planned to be confirmed by experts, historical data, and through real-time learning **e. Ignition risk estimation is planned to use >80% confidence interval**
3				
2				
1				
0				
			Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.1.3 Capability 3: Estimation of wildfire consequences for communities

Capability 3: Estimation of wildfire consequences for communities		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Consequence of ignition events is quantitatively, accurately, and precisely estimated b. Consequence of ignition risk is estimated as a function of at least potential fatalities, and one or both of structures burned, or areas burned c. Ignition risk impact analysis is available for all seasons d. Ignition risk estimation process is mostly (>=50%) automated e. Ignition risk estimation process is done with asset-based granularity f. Outputs of consequence estimation is independently assessed by experts g. Estimation of wildfire consequences uses level and conditions of vegetation and weather, including the vegetation specifics immediately surrounding the ignition site and up-to-date moisture content, local weather patterns	a. Consequence of ignition events is planned to be quantitatively, accurately, and precisely estimated b. Consequence of ignition risk is planned to be estimated as a function of at least potential fatalities, and one or both of structures burned, or areas burned c. Ignition risk impact analysis is planned to be available for all seasons d. Ignition risk estimation process is planned to be mostly (>=50%) automated e. Ignition risk estimation process is planned to be done with asset-based granularity **f. Outputs of consequence estimation is planned to be independently assessed by experts and confirmed based on real time learning, for example, using machine learning** g. Estimation of wildfire consequences plans to use level and conditions of vegetation and weather, including the vegetation specifics immediately surrounding the ignition site and up-to-date moisture content, local weather patterns
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.1.4 Capability 4. Estimation of wildfire and PSPS reduction impact

Capability 4. Estimation of wildfire and PSPS reduction impact		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Approach reliably estimates risk reduction potential of initiatives on an interval scale (e.g., specific quantitative units) b. Estimation of wildfire and PSPS reduction impact is mostly (>=50%) automated c. Estimation of wildfire and PSPS reduction impact has regional granularity d. Ignition risk reduction assessment tool estimates are assessed by independent experts e. Estimation of wildfire and PSPS reduction impact accounts for existing hardware type and condition, including operating history; level and condition of vegetation; weather; and combination of initiatives already deployed	a. Approach is planned to reliably estimate risk reduction potential of initiatives on an interval scale (e.g., specific quantitative units) b. Estimation of wildfire and PSPS reduction impact is planned to be mostly (>=50%) automated **c. Estimation of wildfire and PSPS reduction impact is planned to have circuit-based granularity** **d. Ignition risk reduction assessment tool estimates are planned to be assessed by independent experts, supported by historical data of incidents and near misses** e. Estimation of wildfire and PSPS reduction impact plans to account for existing hardware type and condition, including operating history; level and condition of vegetation; weather; and combination of initiatives already deployed
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.1.5 Capability 5. Risk maps and simulation algorithms

Capability 5. Risk maps and simulation algorithms		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Risk mapping algorithms are updated continuously in real time b. Decision to update algorithms based on deviations is mostly (>=50%) automated c. Deviations from risk model to ignitions and propagations are calculated through a semi-automated process d. Decisions to update algorithms are independently evaluated by experts e. Current / historic ignition and propagation data, as well as near-miss data, is used to decide whether to update algorithms	a. Risk mapping algorithms are planned to be updated continuously in real time b. Decision to update algorithms based on deviations is planned to be mostly (>=50%) automated c. Deviations from risk model to ignitions and propagations are planned to be calculated through a semi-automated process **d. Decisions to update algorithms are planned to be independently evaluated by experts and historical data** **e. Current / historic ignition and propagation data, as well as near-miss data and data from other utilities and other sources, is planned to be used to decide whether to update algorithms**
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.2 B. Situational awareness and forecasting

1.2.2.1 Capability 6: Weather variables collected

Capability 6: Weather variables collected		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. A range of accurate weather variables (e.g., humidity, precipitation, surface and atmospheric wind conditions) that impact probability of ignition and propagation from utility assets are collected b. Measurements are validated through manual field calibration c. Elements that cannot be reliably measured in real time (e.g., fuel moisture content) are being predicted d. More than one data source used for each weather metric collected	a. A range of accurate weather variables (e.g., humidity, precipitation, surface and atmospheric wind conditions) that impact probability of ignition and propagation from utility assets are planned to be collected b. Measurements are planned to be validated through manual field calibration c. Elements that cannot be reliably measured in real time (e.g., fuel moisture content) are planned to be predicted d. More than one data source is planned to be used for each weather metric collected
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.2.2 Capability 7: Weather data resolution

Capability 7: Weather data resolution		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Weather data has sufficient granularity to reliably measure weather conditions in HFTD areas, and along the entire grid and in all areas needed to predict weather on the grid b. Weather data collected at least six times per hour c. Weather data resolution has span-based granularity e. Measurement of weather conditions is fully automated	a. Weather data is planned to have sufficient granularity to reliably measure weather conditions in HFTD areas, and along the entire grid and in all areas needed to predict weather on the grid b. Weather data is planned to be collected at least six times per hour c. Weather data resolution is planned to have span-based granularity d. Measurement of weather conditions is planned to be fully automated
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.2.3 Capability 8: Weather forecasting ability

Capability 8: Weather forecasting ability		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility has the ability to use a combination of accurate weather stations and external weather data to make accurate forecasts b. Accurate forecasts prepared less than two weeks in advance c. Weather forecasts have span-based granularity d. Forecast results are error checked against historical weather patterns and subsequently error checked against measured weather data e. Forecast process is mostly (>=50%) automated	**a. Utility plans to have the ability to use a combination of accurate weather stations and external weather data to make accurate forecasts, and adjust them in real time based on a learning algorithm and updated weather inputs** **b.** Accurate forecasts are planned to be prepared less than two weeks in advance **c.** Weather forecasts are planned to have span-based granularity **d.** Forecast results are planned to be error checked against historical weather patterns and subsequently error checked against measured weather data **e.** Forecast process is planned to be mostly (>=50%) automated
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.2.4 Capability 9: External sources used in weather forecasting

Capability 9: External sources used in weather forecasting		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility uses a combination of accurate weather stations and external weather data, and elects to use the data set, as a whole or in composite, that is most accurate b. Utility uses a mostly automated processes for error checking weather stations with external data sources c. Weather data is used to produce a combined weather map that can be used to help make decisions	a. Utility plans to use a combination of accurate weather stations and external weather data, and elects to use the data set, as a whole or in composite, that is most accurate b. Utility plans to use a mostly automated processes for error checking weather stations with external data sources **c. Weather data is planned to be used to create a single visual and configurable live map that can be used to help make decisions**
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.2.5 Capability 10: Wildfire detection processes and capabilities

Capability 10: Wildfire detection processes and capabilities		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Well-defined procedures for detecting ignitions along the grid exist b. Well-defined equipment for detecting ignitions along grid, including remote detection equipment including cameras, is planned to be used c. Procedure exists for notifying suppression forces and key stakeholders d. Ignition detection software in cameras used to augment ignition detection procedures	a. Well-defined procedures for detecting ignitions along the grid are planned to exist **b. Well-defined equipment for detecting ignitions along grid, including remote detection equipment including cameras and satellite monitoring, is planned to be used** c. Procedure is planned to exist for notifying suppression forces and key stakeholders d. Ignition detection software in cameras is planned to be used to augment ignition detection procedures
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.3 C. Grid design and system hardening

1.2.3.1 Capability 11: Approach to prioritizing initiatives across territory

Capability 11: Approach to prioritizing initiatives across territory		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Plan prioritizes risk reduction initiatives at the span level based on (i) risk modeling driven by local geography and climate / weather conditions, fuel loads and moisture content and topography and (ii) detailed wildfire and PSPS risk simulations across individual circuits	**a. SDG&E plans to prioritize wildfire risk reduction initiatives at the asset level based on (i) risk modeling driven by local geography and climate / weather conditions, fuel loads and moisture content and topography, (ii) risk estimates across individual circuits, including estimates of actual consequence, and (iii) taking power delivery uptime into account (e.g., reliability, PSPS, etc.)**
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.3.2 Capability 12: Grid design for minimizing ignition risk

Capability 12: Grid design for minimizing ignition risk		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. Grid topology exceeds design requirements, designed based on accurate understanding of drivers of utility ignition risk b. Utility provides micro grids or islanding where traditional grid infrastructure is impracticable and wildfire risk is high c. Routing of new portions of the grid takes wildfire risk into account d. Some efforts made in HFTD areas to incorporate the latest asset management strategies and new technologies into grid topology	a. Grid topology is planned to exceed design requirements, designed based on accurate understanding of drivers of utility ignition risk b. Utility provides micro grids or islanding where traditional grid infrastructure is impracticable and wildfire risk is high c. Routing of new portions of the grid takes wildfire risk into account **d. Efforts planned to be made across the entire service area to incorporate the latest asset management strategies and new technologies into grid topology**
3		
2		
1		
0		
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.3.3 Capability 13: Grid design for resiliency and minimizing PSPS

Capability 13: Grid design for resiliency and minimizing PSPS		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility's transmission architecture has (n-1) redundancy for all circuits subject to PSPS b. Utility's distribution architecture has (n-1) redundancy covering at least 50% of customers in HFTD c. Utility's distribution architecture is sectionalized to have switches in HFTD areas to individually isolate circuits, such that no more than 1000 customers sit within one switch d. Utility uses egress points as an input for grid topology design	a. Utility's transmission architecture is planned to have (n-1) redundancy for all circuits subject to PSPS **b. Utility's distribution architecture is planned to have (n-1) redundancy covering at least 70% of customers in HFTD** c. Utility's distribution architecture is planned to be sectionalized to have switches in HFTD areas to individually isolate circuits, such that no more than 1000 customers sit within one switch **d. Egress points available and mapped for each customer, with potential traffic simulated and taken into consideration for grid topology design, and microgrids or other means to reduce consequence for customers at frequent risk of PSPS**
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.3.4 Capability 14: Risk-based grid hardening and cost efficiency

Capability 14: Risk-based grid hardening and cost efficiency		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility has an accurate understanding of the relative cost and effectiveness of different initiatives, tailored to the circumstance of different locations on its grid b. Estimates can be prepared with regional granularity c. Estimates are updated annually or more frequently d. Utility has all grid hardening initiatives included within its evaluation e. Utility cannot evaluate risk reduction synergies from combination various initiatives	a. Utility is planned to have an accurate understanding of the relative cost and effectiveness of different initiatives, tailored to the circumstance of different locations on its grid **b. Estimates can be prepared with circuit-based granularity** c. Estimates are planned to be updated annually or more frequently d. Utility is planned to have all grid hardening initiatives included within its evaluation e. Utility cannot evaluate risk reduction synergies from combination various initiatives
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.3.5 Capability 15: Grid design and asset innovation

Capability 15: Grid design and asset innovation		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. New grid hardening initiatives evaluated based on installation into grid and measuring direct reduction in ignition events, and measuring reduction impact on near-miss metrics b. Results of pilot and commercial deployments, including project performance, project cost, geography, climate, vegetation, etc. are shared extensively with industry, academia, and other utilities c. Performance of new initiatives is not independently audited	**a. New grid hardening initiatives are planned to be independently evaluated, then field tested based on installation into grid and measuring direct reduction in ignition events, and measuring reduction impact on near-miss metrics** **b.** Results of pilot and commercial deployments, including project performance, project cost, geography, climate, vegetation, etc. are planned to be shared extensively with industry, academia, and other utilities **c. Performance of new initiatives is planned to be independently audited**
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.4 D. Asset management and inspections

1.2.4.1 Capability 16: Asset inventory and condition assessments

Capability 16: Asset inventory and condition assessments		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. There is an accurate inventory of equipment that may contribute to wildfire risk, including age, state of wear, and expected lifecycle, including records of all inspections and repairs and up-to-date work plans on expected future repairs and replacements b. Condition assessment is updated quarterly c. A system and approach are in place to reliably detect incipient malfunctions likely to cause ignition in HFTD areas d. Inventory is kept with asset level granularity	**a. There is planned to be an accurate inventory of equipment that may contribute to wildfire risk, including age, state of wear, and expected lifecycle, including records of all inspections and repairs and up-to-date work plans on expected future repairs and replacements wherein repairs and sensor outputs are independently audited** **b. Condition assessment is planned to be updated monthly** **c.** A system and approach are planned to be in place to reliably detect incipient malfunctions likely to cause ignition in HFTD areas **d.** Inventory is kept with asset level granularity
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.4.2 Capability 17: Asset inspection cycle

Capability 17: Asset inspection cycle		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Patrol inspections are above minimum regulatory requirements, with more frequent inspections for highest risk equipment b. Patrol inspections are based on up-to-date static maps of equipment types and environment c. At least annually updated or verified static maps of equipment and environment are the inputs for scheduling patrol inspections d. Detailed inspections are above minimum regulatory requirements, with more frequent inspections for highest risk equipment e. Detailed inspections are based on up-to-date static maps of equipment types and environment f. At least annually updated or verified static maps of equipment and environment are the inputs for scheduling patrol inspections g. Other inspections are above minimum regulatory requirements, with more frequent inspections for highest risk equipment h. Other inspections are based on up-to-date static maps of equipment types and environment	a. Patrol inspections are planned to be above minimum regulatory requirements, with more frequent inspections for highest risk equipment b. Patrol inspections are planned to be based on up-to-date static maps of equipment types and environment c. At least annually updated or verified static maps of equipment and environment are planned to be the inputs for scheduling patrol inspections d. Detailed inspections are planned to be above minimum regulatory requirements, with more frequent inspections for highest risk equipment e. Detailed inspections are planned to be based on up-to-date static maps of equipment types and environment f. At least annually updated or verified static maps of equipment and environment are planned to be the inputs for scheduling patrol inspections g. Other inspections are planned to be above minimum regulatory requirements, with more frequent inspections for highest risk equipment h. Other inspections are planned to be based on up-to-date static maps of equipment types and environment

Capability 17: Asset inspection cycle		
	i. At least annually updated or verified static maps of equipment and environment are inputs for scheduling patrol inspections	i. At least annually updated or verified static maps of equipment and environment are planned to be inputs for scheduling patrol inspections
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.4.3 Capability 18: Asset inspection effectiveness

Capability 18: Asset inspection effectiveness		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations, and include lines and equipment typically responsible for ignitions and near misses b. Procedures and inspection checklists determined based on predictive modeling that considers vegetation and equipment type, age, and condition c. Checklists, training, and procedures are customized at the asset level	a. Patrol, detailed, enhanced, and other inspection procedures and checklists are planned to include all items required by statute and regulations, and include lines and equipment typically responsible for ignitions and near misses b. Procedures and inspection checklists determined are planned to be based on predictive modeling that considers vegetation and equipment type, age, and condition c. Checklists, training, and procedures are planned to be customized at the asset level
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.4.4 Capability 19: Asset maintenance and repair

Capability 19: Asset maintenance and repair		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Electrical lines and equipment maintained as required by regulation, and additional maintenance done in areas of grid at highest wildfire risk based on detailed risk mapping b. Service intervals are set based on wildfire risk in relevant area c. Maintenance and repair procedures take wildfire risk, performance history, and past operating conditions into account	a. Electrical lines and equipment are planned to be maintained as required by regulation, and additional maintenance done in areas of grid at highest wildfire risk is planned to be based on detailed risk mapping **b. Service intervals are planned to be set based on wildfire risk in relevant circuit** c. Maintenance and repair procedures are planned to take wildfire risk, performance history, and past operating conditions into account
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.4.5 Capability 20: QA/QC for asset management

Capability 20: QA/QC for asset management			
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*		
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**	
4 3 2 1 0	a. Contractor activity is audited through an established and functioning audit process to manage and confirm work completed by subcontractors b. Contractors follow the same processes and standards as utility's own employees c. QA/QC information is regularly used to identify deficiencies in quality of work performance and inspections performance d. QA/QC information is used to identify systemic deficiencies in quality of work and inspections, and recommend training based on weaknesses e. Workforce management software tools are used to manage and confirm work completed by subcontractors	a. Contractor activity is planned to be audited through an established and functioning audit process to manage and confirm work completed by subcontractors b. Contractors are planned to follow the same processes and standards as utility's own employees c. QA/QC information is planned to be regularly used to identify deficiencies in quality of work performance and inspections performance d. QA/QC information is planned to be used to identify systemic deficiencies in quality of work and inspections, and recommend training based on weaknesses e. Workforce management software tools are planned to be used to manage and confirm work completed by subcontractors	
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	

1.2.5 E. Vegetation Management and inspections

1.2.5.1 Capability 21: Vegetation inventory for condition assessments

Capability 21: Vegetation inventory for condition assessments		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. There is a centralized inventory of vegetation clearances, including individual vegetation species and their expected growth rate, as well as individual high risk-trees across grid b. Inventory is updated within 1 day of vegetation collection c. Inspections are independently verified by third party experts d. Inventory has asset level granularity	**a. There is planned to be a centralized inventory of vegetation clearances, including individual vegetation species and their expected growth rate, as well as individual high risk-trees across grid. Planned to include up-to-date tree health and moisture content to determine risk of ignition and propagation** **b.** Inventory is planned to be updated within 1 day of vegetation collection **c.** Inspections are planned to be independently verified by third party experts **d.** Inventory is planned to have asset level granularity
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.5.2 Capability 22: Vegetation inspection cycle

Capability 22: Vegetation inspection cycle		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. All types of vegetation inspections are above minimum regulatory requirements, with more frequent inspections for highest risk areas b. Vegetation inspections are scheduled based on up-to-date static maps of predominant vegetation species and environments c. Up to date, static maps of vegetation and environment, as well as data on annual growing conditions, are the inputs for scheduling vegetation inspections	a. All types of vegetation inspections are planned to be above minimum regulatory requirements, with more frequent inspections for highest risk areas **b. Vegetation inspections are planned to be scheduled based on risk, as determined by predictive modeling of vegetation growth and growing conditions** **c. Predictive modeling of vegetation growth is planned to be the input for scheduling vegetation inspections**
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.5.3 Capability 23: Vegetation inspection effectiveness

Capability 23: Vegetation inspection effectiveness		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations, and include vegetation types typically responsible for ignitions and near misses b. Procedures and checklists are based on predictive modeling based on vegetation and equipment type, age, and condition, and are validated by independent experts c. Checklists, training, and procedures are customized at the asset-level	a. Patrol, detailed, enhanced, and other inspection procedures and checklists are planned to include all items required by statute and regulations, and to include vegetation types typically responsible for ignitions and near misses b. Procedures and checklists are planned to be based on predictive modeling based on vegetation and equipment type, age, and condition, and to be validated by independent experts c. Checklists, training, and procedures are planned to be customized at the asset-level
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.5.4 Capability 24: Vegetation grow-in mitigation

Capability 24: Vegetation grow-in mitigation		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. Utility exceeds minimum statutory and regulatory clearances around all lines and equipment b. Utility meets or exceeds minimum statutory or regulatory clearances during all seasons c. Neither ignition risk modeling nor propagation risk modeling is used to guide clearances around lines and equipment d. Species growth rates and species limb failure rates are used to guide clearance around lines and equipment e. Community organizations are engaged in setting local clearances and protocols f. Utility removes vegetation waste along its right of way across the entire grid g. Utility removes vegetation waste along its right of way on the same day as cutting h. Utility works with local landowners to provide a cost effective use for cutting vegetation	a. Utility plans to exceed minimum statutory and regulatory clearances around all lines and equipment b. Utility plans to meet or exceed minimum statutory or regulatory clearances during all seasons **c. Both ignition risk modeling and propagation risk modeling are planned to be used to guide clearances around lines and equipment** **d. Species growth rates and species limb failure rates are planned to be cross referenced with local climatological conditions to guide clearance around lines and equipment** e. Community organizations are planned to be engaged in setting local clearances and protocols f. Utility plans to remove vegetation waste along its right of way across the entire grid g. Utility plans to remove vegetation waste along its right of way on the same day as cutting
3		
2		
1		

Capability 24: Vegetation grow-in mitigation		
0	i. Utility works with partners to identify new cost effective uses for vegetation, taking into consideration environmental impacts and emissions of vegetation waste	h. Utility plans to work with local landowners to provide a cost effective use for cutting vegetation i. Utility plans to work with partners to identify new cost effective uses for vegetation, taking into consideration environmental impacts and emissions of vegetation waste
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.5.5 Capability 25: Vegetation fall-in mitigation

Capability 25: Vegetation fall-in mitigation		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. Utility systematically removes vegetation outside of right of way, informing relevant communities of removal b. Potential vegetation that may pose a threat is identified based on the probability and consequences of impact on electric lines and equipment as determined by risk modeling, as well as regular and accurate systematic inspections for high-risk trees outside the right of way or environmental and climatological conditions contributing to increased risk c. Vegetation is removed with cooperation from the community d. Utility removes vegetation waste outside its right of way across the entire grid e. Utility removes vegetation outside its right of way on the same day as cutting f. Utility works with local landowners to provide a cost effective use for cutting vegetation j. Utility works with partners to identify new cost effective uses for vegetation, taking into consideration environmental impacts and emissions of vegetation waste	a. Utility plans to systematically remove vegetation outside of right of way, informing relevant communities of removal b. Potential vegetation that may pose a threat is planned to be identified based on the probability and consequences of impact on electric lines and equipment as determined by risk modeling, as well as regular and accurate systematic inspections for high-risk trees outside the right of way or environmental and climatological conditions contributing to increased risk c. Vegetation is planned to be removed with cooperation from the community d. Utility plans to remove vegetation waste outside its right of way across the entire grid e. Utility plans to remove vegetation outside its right of way on the same day as cutting f. Utility plans to work with local landowners to provide a cost effective use for cutting vegetation g. Utility plans to work with partners to identify new cost effective uses for vegetation, taking into consideration environmental impacts and emissions of vegetation waste
3		
2		
1		
0		

Capability 25: Vegetation fall-in mitigation		
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.5.6 Capability 26: QA/QC for vegetation management

Capability 26: QA/QC for vegetation management		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Contractor and employee activity audited through an established and functioning audit process to manage and confirm work completed by subcontractors b. Contractors follow the same processes and standards as utility's own employees c. QA/QC information is regularly used to identify deficiencies in quality of work performance and inspections performance d. QA/QC information is used to identify systemic deficiencies in quality of work and inspections, and to recommend training based on weaknesses e. Workforce management software tools are used to manage and confirm work completed by subcontractors	**a. Contractor and employee activity are planned to be audited through an established and functioning audit process that manages and confirms work completed by subcontractors, where contractor activity is subject to semi-automated audits using technologies capable of sampling the contractor's work (e.g., LiDAR scans, photographic evidence)** **b.** Contractors are planned to follow the same processes and standards as utility's own employees **c.** QA/QC information is planned to be used regularly to identify deficiencies in quality of work performance and inspections performance **d.** QA/QC information is planned to be used to identify systemic deficiencies in quality of work and inspections, and to recommend training based on weaknesses **e.** Workforce management software tools are planned to be used to manage and confirm work completed by subcontractors
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.6 F. Grid operations and protocols

1.2.6.1 Capability 27: Protective equipment and device settings

Capability 27: Protective equipment and device settings		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility increases sensitivity of risk reduction elements during high threat weather conditions based on risk mapping and monitors near misses b. A partially automated process is planned to adjust sensitivity of grid elements and evaluate effectiveness c. There is a predetermined protocol driven by fire conditions for adjusting sensitivity of grid elements	a. Utility plans to increase sensitivity of risk reduction elements during high threat weather conditions based on risk mapping and monitors near misses **b. A fully automated process is planned to adjust sensitivity of grid elements and evaluates effectiveness** c. SDG&E plans to have a predetermined protocol driven by fire conditions for adjusting sensitivity of grid elements
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.6.2 Capability 28: Incorporating ignition risk factors in grid control

Capability 28: Incorporating ignition risk factors in grid control		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility has a clearly explained process for determining whether to operate the grid beyond current or voltage designs b. Utility has systems in place to automatically track operation history including current, loads, and voltage throughout the grid at circuit level c. Utility uses predictive modeling to estimate the expected life and make equipment maintenance, rebuild, or replacement decisions based on grid operating history; modeling not evaluated by external experts d. Utility operates the grid above rated voltage and current load during any conditions	a. Utility plans to have a clearly explained process for determining whether to operate the grid beyond current or voltage designs b. Utility plans to have systems in place to automatically track operation history including current, loads, and voltage throughout the grid at circuit level c. Utility plans to use predictive modeling to estimate the expected life and make equipment maintenance, rebuild, or replacement decisions based on grid operating history; modeling not evaluated by external experts d. Utility plans to operate the grid above rated voltage and current load during any conditions
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.6.3 Capability 29: PSPS op. model and consequence mitigation

Capability 29: PSPS op. model and consequence mitigation		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. PSPS event generally forecasted accurately with fewer than 25% of predictions being false positives b. PSPS events are communicated to >98% of affected customers and >99.5% of medical baseline customers in advance of PSPS action c. Less than 0.5% of customers complain during PSPS events d. Website does not go down during PSPS events e. Average downtime per customer is less than 1 hour f. Specific resources are provided to all affected customers to alleviate the impact of the power shutoff (e.g., providing backup generators, supplies, batteries, etc.)	a. PSPS event planned to be generally forecasted accurately with fewer than 25% of predictions being false positives b. PSPS events are planned to be communicated to >98% of affected customers and >99.5% of medical baseline customers in advance of PSPS action c. Less than 0.5% of customers are planned to complain during PSPS events d. Website is not planned to go down during PSPS events e. Average downtime per customer is planned to be less than 1 hour f. Specific resources are planned to be provided to all affected customers to alleviate the impact of the power shutoff (e.g., providing backup generators, supplies, batteries, etc.)
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.6.4 Capability 30: Protocols for PSPS initiation

Capability 30: Protocols for PSPS initiation		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility has explicit policies and explanation for the thresholds above which PSPS is activated as a measure of last resort b. Utility takes into account a partially automated system which recommends circuits for which PSPS should be activated and is validated by SMEs when making PSPS decisions c. Utility de-energizes circuits upon detection of damaged conditions of electric equipment, when circuit presents a safety risk to suppression or other personnel, when equipment has come into contact with foreign objects posing ignition risk, and for additional reasons not listed d. Given condition of the grid, utility expects greater than 5% probability of any large scale PSPS events affecting more than 10,000 people to occur in the coming year; grid condition paired with risk indicates that PSPS may be necessary in 2020 in some areas	a. Utility plans to have explicit policies and explanation for the thresholds above which PSPS is activated as a measure of last resort b. Utility plans to take into account a partially automated system which recommends circuits for which PSPS should be activated and is validated by SMEs when making PSPS decisions c. Utility plans to de-energize circuits upon detection of damaged conditions of electric equipment, when circuit presents a safety risk to suppression or other personnel, when equipment has come into contact with foreign objects posing ignition risk, and for additional reasons not listed d. Given condition of the grid, Utility plans to expect greater than 5% probability of any large scale PSPS events affecting more than 10,000 people to occur in the coming year; grid condition paired with risk indicates that PSPS may be necessary in 2020 in some areas
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.6.5 Capability 31: Protocols for PSPS re-energization

Capability 31: Protocols for PSPS re-energization		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. There is an existing process for accurately inspecting de-energized sections of the grid prior to re-energization, augmented with sensors and aerial tools b. There is a mostly automated (>=50%) process for inspecting de-energized sections of the grid prior to re-energization c. Average time it takes to re-energize grid from a PSPS once weather has subsided to below your de-energization threshold is within 12 hours d. Utility has some probability estimates for ignitions after PSPS events across the grid	a. There is planned to be an existing process for accurately inspecting de-energized sections of the grid prior to re-energization, augmented with sensors and aerial tools b. There is planned to be a mostly automated (>=50%) process for inspecting de-energized sections of the grid prior to re-energization c. Average time it takes to re-energize grid from a PSPS once weather has subsided to below your de-energization threshold is planned to be within 12 hours **d. Utility plans to have accurate quantitative understanding of ignition risk following re-energization, by asset, validated by historical data and near misses**
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.6.6 Capability 32: Ignition prevention and suppression

Capability 32: Ignition prevention and suppression		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility has explicit policies about the role of crews, including contractors and subcontractors, at the site of ignition b. Training and communications tools are provided to immediately report and suppress ignitions caused by workers or in immediate vicinity of workers; communication tools provided function without cell reception; training and tools are provided to both contractors and utility workers c. No Cal/OSHA reported injuries or fatalities occurred in the last year in events where workers have encountered an ignition d. Utility does provide training to other workers at other utilities and outside the utility industry on best practices to minimize, report, and suppress ignition	a. Utility plans to have explicit policies about the role of crews, including contractors and subcontractors, at the site of ignition b. Training and communications tools are planned to be provided to immediately report and suppress ignitions caused by workers or in immediate vicinity of workers; communication tools provided function without cell reception; training and tools are provided to both contractors and utility workers c. No Cal/OSHA reported injuries or fatalities are planned to occur in events where workers have encountered an ignition d. Utility plans to provide training to other workers at other utilities and outside the utility industry on best practices to minimize, report, and suppress ignition
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.7 G. Data Governance

1.2.7.1 Capability 33: Data collection and curation

Capability 33: Data collection and curation		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. Utility has a centralized database of situational, operational, and risk data b. Utility is able to use advanced analytics on its centralized database of situational, operational, and risk data to make short-term and long-term operational and investment decisions c. Utility collects data from all sensored portions of electric lines, equipment, weather stations, etc. d. Utility's database of situational, operational, and risk data is able to ingest and share data using real-time API protocols with a wide variety of stakeholders e. Utility identifies highest priority additional data sources to improve decision making, and plans to incorporate these sources into its centralized database of situational, operational and risk data f. Utility shares best practices for database management and use with other utilities in California and beyond	a. Utility plans to have a centralized database of situational, operational, and risk data b. Utility plans to be able to use advanced analytics on its centralized database of situational, operational, and risk data to make short-term and long-term operational and investment decisions c. Utility plans to collect data from all sensored portions of electric lines, equipment, weather stations, etc. d. Utility's database of situational, operational, and risk data is planned to be able to ingest and share data using real-time API protocols with a wide variety of stakeholders e. Utility plans to identify highest priority additional data sources to improve decision making, and plans to incorporate these sources into its centralized database of situational, operational and risk data f. Utility plans to share best practices for database management and use with other utilities in California and beyond
3		
2		
1		
0		

Capability 33: Data collection and curation		
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.7.2 Capability 34: Data transparency and analytics

Capability 34: Data transparency and analytics		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. There is not a single document cataloguing all fire-related data and algorithms, analyses, and data processes b. There is not an explanation of the sources, cleaning processes, and assumptions made in the single document catalog c. All analyses, algorithms, and data processing are documented d. There is a system capable of sharing across at least three levels of permissions, including utility-regulator permissions, first responder permissions, and public data sharing e. Most relevant wildfire related data algorithms are disclosed publicly in WMP upon request	**a. There is planned to be a single document cataloguing all fire-related data and algorithms, analyses, and data processes** **b. There is planned to be an explanation of the sources, cleaning processes, and assumptions made in the single document catalog** **c. All analyses, algorithms, and data processing are planned to be documented and explained** **d.** SDG&E plans to have a system capable of sharing across at least three levels of permissions, including utility-regulator permissions, first responder permissions, and public data sharing **e.** Most relevant wildfire related data algorithms are planned to be disclosed publicly in WMP upon request
	Criteria missing to reach a maturity level of 1 or more: i) All wildfire-related data and algorithms used by utility are catalogued in a single document, ii) including an explanation of the sources, and assumptions made; and iii) all analysis and algorithms documented	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.7.3 Capability 35: Near-miss tracking

Capability 35: Near-miss tracking		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility tracks near miss data for all near misses with wildfire ignition potential b. Utility is able to simulate wildfire potential given an ignition based on event characteristics, fuel loads, and moisture based on near miss data captured c. Utility captures data related to the specific mode of failure when capturing near-miss data d. Utility is able to predict the probability of a near miss in causing an ignition based on a set of event characteristics e. Utility uses data from near misses to change grid operation protocols in real time	a. Utility plans to track near miss data for all near misses with wildfire ignition potential b. Utility plans to be able to simulate wildfire potential given an ignition based on event characteristics, fuel loads, and moisture based on near miss data captured c. Utility plans to capture data related to the specific mode of failure when capturing near-miss data d. Utility plans to be able to predict the probability of a near miss in causing an ignition based on a set of event characteristics e. Utility plans to use data from near misses to change grid operation protocols in real time
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.7.4 Capability 36: Data sharing with research community

Capability 36: Data sharing with research community		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. Utility makes required data disclosures, and shares data beyond what is required b. Utility funds and participates in both independent and collaborative research, and ensures that research, where possible, is abstracted and applied to other utilities c. Utility research addresses utility ignited wildfires and risk reduction initiatives d. Utility promotes best practices based on latest independent scientific and operational research	a. Utility plans to make required data disclosures, and to share data beyond what is required b. Utility plans to fund and participate in both independent and collaborative research, and to ensure that research, where possible, is abstracted and applied to other utilities c. Utility research plans to address utility ignited wildfires and risk reduction initiatives d. Utility plans to promote best practices based on latest independent scientific and operational research
3		
2		
1		
0		
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.8 H. Resource allocation methodology

1.2.8.1 Capability 37: Scenario analysis across different risk levels

Capability 37: Scenario analysis across different risk levels		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility provides an accurate high-risk reduction and low-risk reduction scenario, and the projected cost and total risk reduction potential b. Utility provides projections for each scenario with region-level granularity c. Utility includes a long term (e.g., 6-10 year) risk estimate taking into account macro factors (climate change, etc.) as well as planned risk reduction initiatives in its scenarios d. Utility provides an estimate of impact on reliability factors in its scenarios	a. Utility plans to provide an accurate high-risk reduction and low-risk reduction scenario, and the projected cost and total risk reduction potential **b. Utility plans to provide projections for each scenario with circuit-level granularity** c. Utility plans to include a long term (e.g., 6-10 year) risk estimate taking into account macro factors (climate change, etc.) as well as planned risk reduction initiatives in its scenarios d. Utility plans to provide an estimate of impact on reliability factors in its scenarios
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.8.2 Capability 38: Presentation of relative risk spend efficiency for portfolio of initiatives

Capability 38: Presentation of relative risk spend efficiency for portfolio of initiatives		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility presents accurate qualitative rankings for its initiatives by risk spend efficiency b. All commercial and emerging initiatives are captured in the ranking of risk spend efficiency c. Utility includes figures for present value cost and project risk reduction impact of each initiative, clearly documenting all assumptions (e.g., useful life, discount rate, etc.) d. Utility provides an explanation of its investment in each particular initiative, including the expected overall reduction in risk and estimates of impact on reliability factors e. Utility is able to provide risk efficiency figures with region-level granularity	a. Utility plans to present accurate qualitative rankings for its initiatives by risk spend efficiency b. All commercial and emerging initiatives are planned to be captured in the ranking of risk spend efficiency c. Utility plans to include figures for present value cost and project risk reduction impact of each initiative, clearly documenting all assumptions (e.g., useful life, discount rate, etc.) d. Utility plans to provide an explanation of its investment in each particular initiative, including the expected overall reduction in risk and estimates of impact on reliability factors **e. Utility plans to provide risk efficiency figures with circuit-level granularity**
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.8.3 Capability 39: Process for determining risk spend efficiency of vegetation management initiatives

Capability 39: Process for determining risk spend efficiency of vegetation management initiatives		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility has accurate quantitative understanding of the cost and effectiveness of producing a reliable risk spend efficiency estimate of vegetation management initiatives b. Risk spend efficiency estimates of vegetation management initiatives can be prepared with region-level granularity c. Risk spend efficiency estimates of vegetation management initiatives are updated annually or more frequently d. All vegetation management initiatives are included within its evaluation e. Utility cannot evaluate risk reduction synergies from combination of various initiatives	a. Utility plans to have accurate quantitative understanding of the cost and effectiveness of producing a reliable risk spend efficiency estimate of vegetation management initiatives **b. Risk spend efficiency estimates of vegetation management initiatives are planned to be prepared with circuit-level granularity** c. Risk spend efficiency estimates of vegetation management initiatives are planned to be updated annually or more frequently d. All vegetation management initiatives are planned to be included within its evaluation e. Utility does not plan to evaluate risk reduction synergies from combination of various initiatives
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.8.4 Capability 40: Process for determining risk spend efficiency of system hardening initiatives

Capability 40: Process for determining risk spend efficiency of system hardening initiatives		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility has accurate quantitative understanding of the cost and effectiveness of producing a reliable risk spend efficiency estimate of system hardening initiatives b. Risk spend efficiency of system hardening initiatives can be prepared with region-based granularity c. Estimates of system hardening initiatives are updated annually or more frequently d. All commercially available grid hardening initiatives are included in the utility risk spend efficiency analysis e. Utility cannot evaluate risk reduction effects from the combination of various initiatives	a. Utility plans to have an accurate quantitative understanding of the cost and effectiveness of producing a reliable risk spend efficiency estimate of system hardening initiatives **b. Risk spend efficiency of system hardening initiatives can be prepared with circuit-based granularity** c. Estimates of system hardening initiatives are updated annually or more frequently **d. All commercially available grid hardening initiatives, as well as those initiatives that are lab tested, are planned to be included in the utility risk spend efficiency analysis** e. Utility does not plan to evaluate risk reduction effects from the combination of various initiatives
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.8.5 Capability 41: Portfolio-wide initiative allocation methodology

Capability 41: Portfolio-wide initiative allocation methodology		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility considers estimates of risk spend efficiency when allocating capital b. Utility takes into account specific information by initiative, including state of equipment and location where initiative will be implemented c. Utility verifies RSE estimates with historical or experimental pilot data d. Utility considers impact on safety, reliability, and other priorities when making spending decisions	**a. Utility plans to consider accurate risk spend efficiency estimates for all initiatives to determine capital allocation across portfolio (e.g. prioritizing between vegetation management and grid hardening)** **b. Utility plans to take into account specific information by initiative, including state of specific assets and location where initiative will be implemented** **c. Utility plans to verify RSE estimates with historical or experimental pilot data and have them confirmed by independent experts / CA utilities** **d.** Utility plans to consider impact on safety, reliability, and other priorities when making spending decisions
	Criteria missing to reach a maturity level of 1 or more: ii) Utility allocates spend within each category of wildfire risk reduction by accurate risk spend efficiency estimates	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.8.6 Capability 42: Portfolio-wide innovation in new wildfire initiatives

Capability 42: Portfolio-wide innovation in new wildfire initiatives		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility uses pilots and measures direct reduction in ignition events and near-misses to develop and evaluate the efficacy of new wildfire initiatives b. Utility uses total cost of ownership to develop and evaluate the risk spend efficiency of new wildfire initiatives c. Utility measures efficacy of new wildfire initiatives with circuit-level granularity d. Reviews of innovative initiatives are not audited by independent parties e. Utility shares the findings of its evaluation of innovative initiatives with other utilities, academia, and the general public	a. Utility plans to use pilots and measures direct reduction in ignition events and near-misses to develop and evaluate the efficacy of new wildfire initiatives b. Utility plans to use total cost of ownership to develop and evaluate the risk spend efficiency of new wildfire initiatives c. Utility plans to measure efficacy of new wildfire initiatives with circuit-level granularity **d. Reviews of innovative initiatives are planned to be audited by independent parties** e. Utility shares the findings of its evaluation of innovative initiatives with other utilities, academia, and the general public
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.9 I. Emergency planning and preparedness

1.2.9.1 Capability 43: Wildfire plan integrated with overall disaster / emergency plan

Capability 43: Wildfire plan integrated with overall disaster / emergency plan		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. Wildfire plan is an integrated component of overall disaster and emergency plans b. Utility runs drills to audit the viability and execution of its wildfire plans c. Impact of confounding events or multiple simultaneous disasters is considered in the planning process d. Plan is integrated with disaster and emergency preparedness plans of other relevant stakeholders (e.g., CAL FIRE, Fire Safe Councils, etc.) e. Utility takes a leading role in planning, coordinating, and integrating plans across stakeholders	a. Wildfire plan is planned to be an integrated component of overall disaster and emergency plans b. Utility plans to run drills to audit the viability and execution of its wildfire plans c. Impact of confounding events or multiple simultaneous disasters is planned to be considered in the planning process d. Wildfire plan is planned to be integrated with disaster and emergency preparedness plans of other relevant stakeholders (e.g., CAL FIRE, Fire Safe Councils, etc.) e. Utility plans to take a leading role in planning, coordinating, and integrating plans across stakeholders
3		
2		
1		
0		
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.9.2 Capability 44: Plan to restore service after wildfire related outage

Capability 44: Plan to restore service after wildfire related outage		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. Detailed and actionable procedures are in place to restore service after a wildfire related outage b. Employee and subcontractor crews are trained in and aware of plans c. Procedures to restore service after a wildfire-related outage are customized with span-level granularity d. Customized procedure to restore service is based on topography, vegetation, and community needs e. There is an inventory of high risk spend efficiency resources available for repairs f. Wildfire plan is an integrated component of overall disaster and emergency plans	a. Detailed and actionable procedures are planned to be in place to restore service after a wildfire related outage b. Employee and subcontractor crews are planned to be trained in and aware of plans c. Procedures to restore service after a wildfire-related outage are planned to be customized with span-level granularity d. Customized procedure to restore service is planned to be based on topography, vegetation, and community needs e. There is planned to be an inventory of high risk spend efficiency resources available for repairs f. Wildfire plan is planned to be an integrated component of overall disaster and emergency plans
3		
2		
1		
0		
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.9.3 Capability 45: Emergency community engagement during and after wildfire

Capability 45: Emergency community engagement during and after wildfire		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. Utility provides clear and substantially complete communication of available information relevant to affected customers, as well as referrals to other emergency management resources b. >99.9% of customers receive complete details of available information c. >99.9% of affected medical baseline customers receive complete details of available information d. Utility assists where helpful with communication of information related to power outages to customers through availability of relevant evacuation information and links on website / toll-free telephone number, and assisting disaster response professionals as requested e. Utility has detailed and actionable established protocols for engaging with emergency management organizations f. Utility communicates and coordinates resources to communities during emergencies (e.g., shelters, supplies, transportation, etc.)	a. Utility plans to provide clear and substantially complete communication of available information relevant to affected customers, as well as referrals to other emergency management resources b. >99.9% of customers are planned to receive complete details of available information c. >99.9% of affected medical baseline customers are planned to receive complete details of available information d. Utility plans to assist where helpful with communication of information related to power outages to customers through availability of relevant evacuation information and links on website / toll-free telephone number, and assisting disaster response professionals as requested e. Utility plans to have detailed and actionable established protocols for engaging with emergency management organizations f. Utility plans to communicate and coordinate resources to communities during emergencies (e.g., shelters, supplies, transportation, etc.)
3		
2		
1		
0		

Capability 45: Emergency community engagement during and after wildfire		
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.9.4 Capability 46: Protocols in place to learn from wildfire events

Capability 46: Protocols in place to learn from wildfire events		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. There is a protocol in place to record the outcome of emergency events and to clearly and actionably document learnings and potential process improvements b. There is a defined process and staff responsible for incorporating learnings into emergency plan c. SDG&E uses "dry runs" to test plans updated based on learnings and improvements to confirm its effectiveness d. There is a defined process to solicit input from a variety of other stakeholders and incorporate learnings from other stakeholders into the emergency plan	a. SDG&E plans to have a protocol in place to record the outcome of emergency events and to clearly and actionably document learnings and potential process improvements b. SDG&E plans to have a defined process and staff responsible for incorporating learnings into emergency plan c. SDG&E plans to have "dry runs" to test plans updated based on learnings and improvements to confirm its effectiveness d. SDG&E plans to have a defined process to solicit input from a variety of other stakeholders and incorporate learnings from other stakeholders into the emergency plan
3		
2		
1		
0		
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.9.5 Capability 47: Processes for continuous improvement after wildfire and PSPS

Capability 47: Processes for continuous improvement after wildfire and PSPS		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. Utility conducts an evaluation or debrief process after a wildfire b. Utility conducts a customer survey and utilizes partners to disseminate requests for stakeholder engagement c. Utility engages in public listening sessions, debriefs with partners and others d. Utility shares findings with partners about what can be improved e. Feedback and recommendations on potential improvements are made public f. Utility conducts proactive outreach to local agencies and organizations to solicit additional feedback on what can be improved g. Utility has a clear plan for post-event listening and incorporating lessons learned from all stakeholders	a. Utility plans to conduct an evaluation or debrief process after a wildfire b. Utility plans to conduct a customer survey and utilize partners to disseminate requests for stakeholder engagement c. Utility plans to engage in public listening sessions, debriefs with partners and others d. Utility plans to share findings with partners about what can be improved e. Feedback and recommendations on potential improvements are planned to be made public f. Utility plans to conduct proactive outreach to local agencies and organizations to solicit additional feedback on what can be improved g. Utility plans to have a clear plan for post-event listening and incorporating lessons learned from all stakeholders
3		
2		
1		

Capability 47: Processes for continuous improvement after wildfire and PSPS		
0	h. Utility tracks the implementation of recommendations and report upon their impact i. Utility has a process to conduct reviews after wildfires in other territories of other utilities and states to identify and address areas of improvement	h. Utility plans to track the implementation of recommendations and report upon their impact i. Utility plans to have a process to conduct reviews after wildfires in other territories of other utilities and states to identify and address areas of improvement
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.10 J. Stakeholder cooperation and community engagement

1.2.10.1 Capability 48: Cooperation and best practice sharing with other utilities

Capability 48: Cooperation and best practice sharing with other utilities		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility actively works to identify best practices from other global utilities through a clearly defined operational process b. Utility successfully adopts and implements best practices identified from other utilities c. Utility seeks to share best practices and lessons learned in a consistent format d. Utility shares best practices and lessons via a consistent and predictable set of venues / media e. Utility participates in annual benchmarking exercises with other utilities to find other areas for improvement f. Utility has implemented a defined process for testing lessons learned from other utilities to ensure local applicability	a. Utility plans to actively work to identify best practices from other global utilities through a clearly defined operational process b. Utility plans to successfully adopt and implement best practices identified from other utilities c. Utility plans to seek to share best practices and lessons learned in a consistent format d. Utility plans to share best practices and lessons via a consistent and predictable set of venues / media e. Utility plans to participate in annual benchmarking exercises with other utilities to find other areas for improvement f. Utility plans to implement a defined process for testing lessons learned from other utilities to ensure local applicability
	Criteria missing to reach a maturity level of 1 or more:	**Criteria missing to reach a maturity level of 1 or more:**

Capability 48: Cooperation and best practice sharing with other utilities		
	• N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	• N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.10.2 Capability 49: Engagement with communities on utility wildfire mitigation initiatives

Capability 49: Engagement with communities on utility wildfire mitigation initiatives		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 2023 Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. Utility has a clear and actionable plan to develop or maintain a collaborative relationship with local communities b. There are not communities in HFTD areas where meaningful resistance is expected in response to efforts to mitigate fire risk (e.g., vegetation clearance) c. Less than 1% of landowners are non-compliant with utility initiatives (e.g., vegetation management) d. Less than 1% of landowners complain about utility initiatives (e.g., vegetation management) e. Utility has a demonstratively cooperative relationship with communities containing >90% of the population in HFTD areas (e.g., by being recognized by other agencies as having a cooperative relationship with those communities in HFTD areas) f. Utility has records of landowners throughout communities containing >90% of the population in HFTD areas reaching out to notify of risks, dangers, or issues in the past year	a. Utility plans to have a clear and actionable plan to develop or maintain a collaborative relationship with local communities b. SDG&E does not plan to have communities in HFTD areas where meaningful resistance is expected in response to efforts to mitigate fire risk (e.g., vegetation clearance) c. SDG&E plans to have less than 1% of landowners non-compliant with utility initiatives (e.g., vegetation management) d. SDG&E plans to have less than 1% of landowners complain about utility initiatives (e.g., vegetation management) e. Utility plans to have a demonstratively cooperative relationship with communities containing >90% of the population in HFTD areas (e.g., by being recognized by other agencies as having a cooperative relationship with those communities in HFTD areas) f. Utility plans to have records of landowners throughout communities containing >90% of the population in HFTD areas reaching out to notify of risks, dangers, or issues in the past year
3		
2		
1		
0		

Capability 49: Engagement with communities on utility wildfire mitigation initiatives		
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.10.3 Capability 50: Engagement with LEP and AFN populations

Capability 50: Engagement with LEP and AFN populations		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4	a. Utility provides a plan to partner with organizations representing Limited English Proficiency (LEP) and Access & Functional Needs (AFN) communities b. Utility can outline how partnerships with LEP and AFN communities create pathways for implementing suggested activities to address the needs of these communities c. Utility can point to clear examples of how relationships with LEP and AFN communities have driven the utility's ability to interact with and prepare these communities for wildfire mitigation activities d. Utility has a specific annually-updated action plan to further reduce wildfires and PSPS risk to LEP & AFN communities	a. Utility plans to provide a plan to partner with organizations representing Limited English Proficiency (LEP) and Access & Functional Needs (AFN) communities b. Utility plans to be able to outline how partnerships with LEP and AFN communities create pathways for implementing suggested activities to address the needs of these communities c. Utility plans to be able to point to clear examples of how relationships with LEP and AFN communities have driven the utility's ability to interact with and prepare these communities for wildfire mitigation activities d. Utility plans to have a specific annually-updated action plan to further reduce wildfires and PSPS risk to LEP & AFN communities
3		
2		
1		
0		
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.10.4 Capability 51: Collaboration with emergency response agencies

Capability 51: Collaboration with emergency response agencies		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility cooperates with suppression agencies by notifying them of ignitions b. Utility is cooperating with suppression agencies throughout utility service areas c. Utility accurately predicts and communicates the forecasted fire propagation path using available analytics resources and weather data d. Utility communicates fire paths to the community as requested e. Utility works to assist suppression crews logistically where possible	a. Utility plans to cooperate with suppression agencies by notifying them of ignitions b. Utility plans to cooperate with suppression agencies throughout utility service areas c. Utility plans to be able to accurately predict and communicate the forecasted fire propagation path using available analytics resources and weather data d. Utility plans to be able to communicate fire paths to the community as requested e. Utility plans to work to assist suppression crews logistically where possible
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.2.10.5 Capability 52: Collaboration on wildfire mitigation planning with stakeholders

Capability 52: Collaboration on wildfire mitigation planning with stakeholders		
Automated maturity levels based on Maturity Rubric	**Responses to survey questions** *Each letter indicates a survey question, with the relevant response shown below.*	
Legend 2020 / 2023 / Both	Current state As of February 2020	Planned state for 2023 "Three years from now" as of February 2020 **Bold responses have planned growth between 2020 and 2023**
4 3 2 1 0	a. Utility conducts fuel management along its rights of way b. Utility shares fuel management plans with other stakeholders, and coordinates fuel management activities, including adjusting plans, to cooperate with other stakeholders state-wide to focus on areas that would have the biggest impact in reducing wildfire risk c. Utility does not cultivate a native vegetative ecosystem across territory that is consistent with lower fire risk d. Utility funds local groups (e.g., fire safe councils) to support fuel management	**a. Utility is plans to conduct fuel management throughout the service area** **b.** Utility plans to share fuel management plans with other stakeholders, and coordinate fuel management activities, including adjusting plans, to cooperate with other stakeholders state-wide to focus on areas that would have the biggest impact in reducing wildfire risk **c. Utility plans to cultivate a native vegetative ecosystem across territory that is consistent with lower fire risk** **d.** Utility plans to fund local groups (e.g., fire safe councils) to support fuel management
	Criteria missing to reach a maturity level of 1 or more: • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric	**Criteria missing to reach a maturity level of 1 or more:** • N/A – all criteria to reach a 1 are met based on survey responses and maturity rubric

1.3 SDG&E: Numerical maturity summary

Please reference the Guidance Resolution for the Maturity Rubric and for necessary context to interpret the levels shown below. **All levels are based solely on the Maturity Rubric and on SDG&E's responses to the Utility Wildfire Mitigation Maturity Survey ("Survey").**

"2020" refers to February 2020, and "2023" refers to February 2023. See the Survey for more detail.

Legend: **2020 Maturity Level** | **2023 Maturity Level** | **Maturity Level for 2020 and 2023**

Category	Capability I	Capability II	Capability III	Capability IV	Capability V	Capability VI
A. Risk assessment and mapping	1. Climate scenario modeling: 0 1 2 **3** 4	2. Ignition risk estimation: 0 1 **2** 3 4	3. Estimation of wildfire consequences for communities: 0 1 **2** 3 4	4. Estimation of wildfire and PSPS reduction impact: 0 **1** **2** 3 4	5. Risk maps and simulation algorithms: 0 1 **2** **3** 4	N/A
B. Situational awareness and forecasting	6. Weather variables collected: 0 1 **2** 3 4	7. Weather data resolution: 0 1 2 **3** 4	8. Weather forecasting ability: 0 1 2 **3** 4	9. External sources used in weather forecasting: 0 1 2 **3** 4	10. Wildfire detection processes and capabilities: 0 1 **2** 3 4	N/A
C. Grid design and system hardening	11. Approach to prioritizing initiatives across territory: 0 1 2 **3** **4**	12. Grid design for minimizing ignition risk: 0 1 2 3 **4**	13. Grid design for resiliency and minimizing PSPS: 0 1 **2** **3** 4	14. Risk-based grid hardening and cost efficiency: 0 **1** **2** 3 4	15. Grid design and asset innovation: 0 1 **2** 3 **4**	N/A
D. Asset management and inspections	16. Asset inventory and condition assessments: 0 **1** **2** 3 4	17. Asset inspection cycle: 0 1 **2** 3 4	18. Asset inspection effectiveness: 0 1 **2** 3 4	19. Asset maintenance and repair: 0 1 2 **3** 4	20. QA/QC for asset management: 0 1 **2** 3 4	N/A
E. Vegetation management and inspections	21. Vegetation inventory for condition assessment: 0 1 2 **3** **4**	22. Vegetation inspection cycle: 0 1 **2** **3** 4	23. Vegetation inspection effectiveness: 0 1 2 **3** 4	24. Vegetation grow-in mitigation: 0 1 **2** 3 **4**	25. Vegetation fall-in mitigation: 0 1 2 3 **4**	26. QA/QC for vegetation management: 0 1 **2** **3** 4
F. Grid operations and protocols	27. Protective equipment and device settings: 0 1 2 **3** **4**	28. Incorporating ignition risk factors in grid control: 0 1 **2** 3 4	29. PSPS op. model and consequence mitigation: 0 **1** 2 3 4	30. Protocols for PSPS initiation: 0 1 **2** 3 4	31. Protocols for PSPS re-energization: 0 1 2 **3** 4	32. Ignition prevention and suppression: 0 1 2 3 **4**
G. Data governance	33. Data collection and curation: 0 1 2 3 **4**	34. Data transparency and analytics: **0** 1 **2** 3 4	35. Near-miss tracking: 0 1 2 3 **4**	36. Data sharing with research community: 0 1 2 3 **4**	N/A	N/A
H. Resource allocation methodology	37. Scenario analysis across different risk levels: 0 **1** 2 3 4	38. Presentation of relative risk spend efficiency for portfolio of initiatives: 0 **1** **2** 3 4	39. Process for determining risk spend efficiency of vegetation management initiatives: 0 **1** **2** 3 4	40. Process for determining risk spend efficiency of system hardening initiatives: 0 **1** **2** 3 4	41. Portfolio-wide initiative allocation methodology: **0** 1 2 3 **4**	42. Portfolio-wide innovation in new wildfire initiatives: 0 1 **2** 3 4
I. Emergency planning and preparedness	43. Wildfire plan integrated with overall disaster / emergency plan: 0 1 2 3 **4**	44. Plan to restore service after wildfire related outage: 0 1 2 3 **4**	45. Emergency community engagement during and after wildfire: 0 1 2 3 **4**	46. Protocols in place to learn from wildfire events: 0 1 2 3 **4**	47. Process for continuous improvement after wildfire and PSPS: 0 1 2 3 **4**	N/A
J. Stakeholder cooperation and community engagement	48. Cooperation and best practice sharing with other utilities: 0 1 2 3 **4**	49. Engagement with communities on utility wildfire mitigation initiatives: 0 1 2 3 **4**	50. Engagement with LEP and AFN populations: 0 1 2 3 **4**	51. Collaboration with emergency response agencies: 0 1 **2** 3 4	52. Collaboration on wildfire mitigation planning with stakeholders: 0 1 **2** **3** 4	N/A

(End of Appendix C)

APPENDIX D

Definitions of Mitigation Initiatives from Section 5 of WMP Guidelines

5.3.11 Definitions of initiatives by category

Category	Initiative	Definition
A. Risk mapping and simulation	A summarized risk map that shows the overall ignition probability and estimated wildfire consequence along the electric lines and equipment	Development and use of tools and processes to develop and update risk map and simulations and to estimate risk reduction potential of initiatives for a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Climate-driven risk map and modelling based on various relevant weather scenarios	Development and use of tools and processes to estimate incremental risk of foreseeable climate scenarios, such as drought, across a given portion of the grid (or more granularly, e.g., circuit, span, or asset). May include verification efforts, independent assessment by experts, and updates.
	Ignition probability mapping showing the probability of ignition along the electric lines and equipment	Development and use of tools and processes to assess the risk of ignition across regions of the grid (or more granularly, e.g., circuits, spans, or assets).
	Initiative mapping and estimation of wildfire and PSPS risk-reduction impact	Development of a tool to estimate the risk reduction efficacy (for both wildfire and PSPS risk) and risk-spend efficiency of various initiatives.
	Match drop simulations showing the potential wildfire consequence of ignitions that occur along the electric lines and equipment	Development and use of tools and processes to assess the impact of potential ignition and risk to communities (e.g., in terms of potential fatalities, structures burned, monetary damages, area burned, impact on air quality and greenhouse gas, or GHG, reduction goals, etc.).
B. Situational awareness and forecasting	Advanced weather monitoring and weather stations	Purchase, installation, maintenance, and operation of weather stations. Collection, recording, and analysis of weather data from weather stations and from external sources.
	Continuous monitoring sensors	Installation, maintenance, and monitoring of sensors and sensorized equipment used to monitor the condition of electric lines and equipment.
	Fault indicators for detecting faults on electric lines and equipment	Installation and maintenance of fault indicators.
	Forecast of a fire risk index, fire potential index, or similar	Index that uses a combination of weather parameters (such as wind speed, humidity, and temperature), vegetation and/or fuel conditions, and other factors to judge current fire risk and to create a forecast indicative of fire risk. A sufficiently granular index shall inform operational decision-making.
	Personnel monitoring areas of electric lines and equipment in elevated fire risk conditions	Personnel position within utility service territory to monitor system conditions and weather on site. Field observations shall inform operational decisions.
	Weather forecasting and estimating impacts on electric lines and equipment	Development methodology for forecast of weather conditions relevant to utility operations, forecasting weather conditions and conducting analysis to incorporate into utility decision-making, learning and updates to reduce false positives and false negatives of forecast PSPS conditions.

Category	Initiative	Definition
C. Grid design and system hardening	Capacitor maintenance and replacement program	Remediation, adjustments, or installations of new equipment to improve or replace existing capacitor equipment.
	Circuit breaker maintenance and installation to de-energize lines upon detecting a fault	Remediation, adjustments, or installations of new equipment to improve or replace existing fast switching circuit breaker equipment to improve the ability to protect electrical circuits from damage caused by overload of electricity or short circuit.
	Covered conductor installation	Installation of covered or insulated conductors to replace standard bare or unprotected conductors (defined in accordance with GO 95 as supply conductors, including but not limited to lead wires, not enclosed in a grounded metal pole or not covered by: a "suitable protective covering" (in accordance with Rule 22.8), grounded metal conduit, or grounded metal sheath or shield). In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.
	Covered conductor maintenance	Remediation and adjustments to installed covered or insulated conductors. In accordance with GO 95, conductor is defined as a material suitable for: (1) carrying electric current, usually in the form of a wire, cable or bus bar, or (2) transmitting light in the case of fiber optics; insulated conductors as those which are surrounded by an insulating material (in accordance with Rule 21.6), the dielectric strength of which is sufficient to withstand the maximum difference of potential at normal operating voltages of the circuit without breakdown or puncture; and suitable protective covering as a covering of wood or other non-conductive material having the electrical insulating efficiency (12kV/in. dry) and impact strength (20ft.-lbs) of 1.5 inches of redwood or other material meeting the requirements of Rule 22.8-A, 22.8-B, 22.8-C or 22.8-D.
	Crossarm maintenance, repair, and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing crossarms, defined as horizontal support attached to poles or structures generally at right angles to the conductor supported in accordance with GO 95.
	Distribution pole replacement and reinforcement, including with composite poles	Remediation, adjustments, or installations of new equipment to improve or replace existing distribution poles (i.e., those supporting lines under 65kV), including with equipment such as composite poles manufactured with materials reduce ignition probability by increasing pole lifespan and resilience against failure from object contact and other events.
	Expulsion fuse replacement	Installations of new and CAL FIRE-approved power fuses to replace existing expulsion fuse equipment.

Category	Initiative	Definition
	Grid topology improvements to mitigate or reduce PSPS events	Plan to support and actions taken to mitigate or reduce PSPS events in terms of geographic scope and number of customers affected, such as installation and operation of electrical equipment to sectionalize or island portions of the grid, microgrids, or local generation.
	Installation of system automation equipment	Installation of electric equipment that increases the ability of the utility to automate system operation and monitoring, including equipment that can be adjusted remotely such as automatic reclosers (switching devices designed to detect and interrupt momentary faults that can reclose automatically and detect if a fault remains, remaining open if so).
	Maintenance, repair, and replacement of connectors, including hotline clamps	Remediation, adjustments, or installations of new equipment to improve or replace existing connector equipment, such as hotline clamps.
	Mitigation of impact on customers and other residents affected during PSPS event	Actions taken to improve access to electricity for customers and other residents during PSPS events, such as installation and operation of local generation equipment (at the community, household, or other level).
	Other corrective action	Other maintenance, repair, or replacement of utility equipment and structures so that they function properly and safely, including remediation activities (such as insulator washing) of other electric equipment deficiencies that may increase ignition probability due to potential equipment failure or other drivers.
	Pole loading infrastructure hardening and replacement program based on pole loading assessment program	Actions taken to remediate, adjust, or install replacement equipment for poles that the utility has identified as failing to meet safety factor requirements in accordance with GO 95 or additional utility standards in the utility's pole loading assessment program.
	Transformers maintenance and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing transformer equipment.
	Transmission tower maintenance and replacement	Remediation, adjustments, or installations of new equipment to improve or replace existing transmission towers (e.g., structures such as lattice steel towers or tubular steel poles that support lines at or above 65kV).
	Undergrounding of electric lines and/or equipment	Actions taken to convert overhead electric lines and/or equipment to underground electric lines and/or equipment (i.e., located underground and in accordance with GO 128).
	Updates to grid topology to minimize risk of ignition in HFTDs	Changes in the plan, installation, construction, removal, and/or undergrounding to minimize the risk of ignition due to the design, location, or configuration of utility electric equipment in HFTDs.

Category	Initiative	Definition
D. Asset management and inspections	Detailed inspections of distribution electric lines and equipment	In accordance with GO 165, careful visual inspections of overhead electric distribution lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.
	Detailed inspections of transmission electric lines and equipment	Careful visual inspections of overhead electric transmission lines and equipment where individual pieces of equipment and structures are carefully examined, visually and through use of routine diagnostic test, as appropriate, and (if practical and if useful information can be so gathered) opened, and the condition of each rated and recorded.
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	Infrared inspections of distribution electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using infrared (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	Infrared inspections of transmission electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using infrared (heat-sensing) technology and cameras that can identify "hot spots", or conditions that indicate deterioration or potential equipment failures, of electrical equipment.
	Intrusive pole inspections	In accordance with GO 165, intrusive inspections involve movement of soil, taking samples for analysis, and/or using more sophisticated diagnostic tools beyond visual inspections or instrument reading.
	LiDAR inspections of distribution electric lines and equipment	Inspections of overhead electric transmission lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	LiDAR inspections of transmission electric lines and equipment	Inspections of overhead electric distribution lines, equipment, and right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	Other discretionary inspection of distribution electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric transmission lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspection of transmission electric lines and equipment, beyond inspections mandated by rules and regulations	Inspections of overhead electric distribution lines, equipment, and right-of-way that exceed or otherwise go beyond those mandated by rules and regulations, including GO 165, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.,
	Patrol inspections of distribution electric lines and equipment	In accordance with GO 165, simple visual inspections of overhead electric distribution lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.

Category	Initiative	Definition
	Patrol inspections of transmission electric lines and equipment	Simple visual inspections of overhead electric transmission lines and equipment that is designed to identify obvious structural problems and hazards. Patrol inspections may be carried out in the course of other company business.
	Pole loading assessment program to determine safety factor	Calculations to determine whether a pole meets pole loading safety factor requirements of GO 95, including planning and information collection needed to support said calculations. Calculations shall consider many factors including the size, location, and type of pole; types of attachments; length of conductors attached; and number and design of supporting guys, per D.15-11-021.
	Quality assurance / quality control of inspections	Establishment and function of audit process to manage and confirm work completed by employees or subcontractors, including packaging QA/QC information for input to decision-making and related integrated workforce management processes.
	Substation inspections	In accordance with GO 175, inspection of substations performed by qualified persons and according to the frequency established by the utility, including record-keeping.
E. Vegetation management and inspection	Additional efforts to manage community and environmental impacts	Plan and execution of strategy to mitigate negative impacts from utility vegetation management to local communities and the environment, such as coordination with communities to plan and execute vegetation management work or promotion of fire-resistant planting practices
	Detailed inspections of vegetation around distribution electric lines and equipment	Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.
	Detailed inspections of vegetation around transmission electric lines and equipment	Careful visual inspections of vegetation around the right-of-way, where individual trees are carefully examined, visually, and the condition of each rated and recorded.
	Emergency response vegetation management due to red flag warning or other urgent conditions	Plan and execution of vegetation management activities, such as trimming or removal, executed based upon and in advance of forecast weather conditions that indicate high fire threat in terms of ignition probability and wildfire consequence.
	Fuel management and reduction of “slash” from vegetation management activities	Plan and execution of fuel management activities that reduce the availability of fuel in proximity to potential sources of ignition, including both reduction or adjustment of live fuel (in terms of species or otherwise) and of dead fuel, including "slash" from vegetation management activities that produce vegetation material such as branch trimmings and felled trees.
	Improvement of inspections	Identifying and addressing deficiencies in inspections protocols and implementation by improving training and the evaluation of inspectors.
	LiDAR inspections of vegetation around distribution electric lines and equipment	Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).
	LiDAR inspections of vegetation around transmission electric lines and equipment	Inspections of right-of-way using LiDAR (Light Detection and Ranging, a remote sensing method that uses light in the form of a pulsed laser to measure variable distances).

Category	Initiative	Definition
	Other discretionary inspections of vegetation around distribution electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Other discretionary inspections of vegetation around transmission electric lines and equipment	Inspections of rights-of-way and adjacent vegetation that may be hazardous, which exceeds or otherwise go beyond those mandated by rules and regulations, in terms of frequency, inspection checklist requirements or detail, analysis of and response to problems identified, or other aspects of inspection or records kept.
	Patrol inspections of vegetation around distribution electric lines and equipment	Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.
	Patrol inspections of vegetation around transmission electric lines and equipment	Visual inspections of vegetation along rights-of-way that is designed to identify obvious hazards. Patrol inspections may be carried out in the course of other company business.
	Quality assurance / quality control of vegetation inspections	Establishment and function of audit process to manage and confirm work completed by employees or subcontractors, including packaging QA/QC information for input to decision-making and related integrated workforce management processes.
	Recruiting and training of vegetation management personnel	Programs to ensure that the utility is able to identify and hire qualified vegetation management personnel and to ensure that both full-time employees and contractors tasked with vegetation management responsibilities are adequately trained to perform vegetation management work, according to the utility's wildfire mitigation plan, in addition to rules and regulations for safety.
	Remediation of at-risk species	Actions taken to reduce the ignition probability and wildfire consequence attributable to at-risk vegetation species, such as trimming, removal, and replacement.
	Removal and remediation of trees with strike potential to electric lines and equipment	Actions taken to remove or otherwise remediate trees that could potentially strike electrical equipment, if adverse events such as failure at the ground-level of the tree or branch breakout within the canopy of the tree, occur.
	Substation inspection	Inspection of vegetation surrounding substations, performed by qualified persons and according to the frequency established by the utility, including record-keeping.
	Substation vegetation management	Based on location and risk to substation equipment only, actions taken to reduce the ignition probability and wildfire consequence attributable to contact from vegetation to substation equipment.
	Vegetation inventory system	Inputs, operation, and support for centralized inventory of vegetation clearances updated based upon inspection results, including (1) inventory of species, (2) forecasting of growth, (3) forecasting of when growth threatens minimum right-of-way clearances (“grow-in” risk) or creates fall-in/fly-in risk.
	Vegetation management to achieve clearances around electric lines and equipment	Actions taken to ensure that vegetation does not encroach upon the minimum clearances set forth in Table 1 of GO 95, measured between line conductors and vegetation, such as trimming adjacent or overhanging tree limbs.

Category	Initiative	Definition
F. Grid operations and protocols	Automatic recloser operations	Designing and executing protocols to deactivate automatic reclosers based on local conditions for ignition probability and wildfire consequence.
	Crew-accompanying ignition prevention and suppression resources and services	Those firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, and water) that are deployed with construction crews and other electric workers to provide site-specific fire prevention and ignition mitigation during on-site work
	Personnel work procedures and training in conditions of elevated fire risk	Work activity guidelines that designate what type of work can be performed during operating conditions of different levels of wildfire risk. Training for personnel on these guidelines and the procedures they prescribe, from normal operating procedures to increased mitigation measures to constraints on work performed.
	Protocols for PSPS re-energization	Designing and executing procedures that accelerate the restoration of electric service in areas that were de-energized, while maintaining safety and reliability standards.
	PSPS events and mitigation of PSPS impacts	Designing, executing, and improving upon protocols to conduct PSPS events, including development of advanced methodologies to determine when to use PSPS, and to mitigate the impact of PSPS events on affected customers and local residents.
	Stationed and on-call ignition prevention and suppression resources and services	Firefighting staff and equipment (such as fire suppression engines and trailers, firefighting hose, valves, firefighting foam, chemical extinguishing agent, and water) stationed at utility facilities and/or standing by to respond to calls for fire suppression assistance.
G. Data governance	Centralized repository for data	Designing, maintaining, hosting, and upgrading a platform that supports storage, processing, and utilization of all utility proprietary data and data compiled by the utility from other sources.
	Collaborative research on utility ignition and/or wildfire	Developing and executing research work on utility ignition and/or wildfire topics in collaboration with other non-utility partners, such as academic institutions and research groups, to include data-sharing and funding as applicable.
	Documentation and disclosure of wildfire-related data and algorithms	Design and execution of processes to document and disclose wildfire-related data and algorithms to accord with rules and regulations, including use of scenarios for forecasting and stress testing.
	Tracking and analysis of near miss data	Tools and procedures to monitor, record, and conduct analysis of data on near miss events.
H. Resource allocation methodology	Allocation methodology development and application	Development of prioritization methodology for human and financial resources, including application of said methodology to utility decision-making.
	Risk reduction scenario development and analysis	Development of modelling capabilities for different risk reduction scenarios based on wildfire mitigation initiative implementation; analysis and application to utility decision-making.
	Risk spend efficiency analysis	Tools, procedures, and expertise to support analysis of wildfire mitigation initiative risk-spend efficiency, in terms of MAVF and/ or MARS methodologies.

Category	Initiative	Definition
I. Emergency planning and preparedness	Adequate and trained workforce for service restoration	Actions taken to identify, hire, retain, and train qualified workforce to conduct service restoration in response to emergencies, including short-term contracting strategy and implementation.
	Community outreach, public awareness, and communications efforts	Actions to identify and contact key community stakeholders; increase public awareness of emergency planning and preparedness information; and design, translate, distribute, and evaluate effectiveness of communications taken before, during, and after a wildfire, including Access and Functional Needs populations and Limited English Proficiency populations in particular.
	Customer support in emergencies	Resources dedicated to customer support during emergencies, such as website pages and other digital resources, dedicated phone lines, etc.
	Disaster and emergency preparedness plan	Development of plan to deploy resources according to prioritization methodology for disaster and emergency preparedness of utility and within utility service territory (such as considerations for critical facilities and infrastructure), including strategy for collaboration with Public Safety Partners and communities.
	Preparedness and planning for service restoration	Development of plans to prepare the utility to restore service after emergencies, such as developing employee and staff trainings, and to conduct inspections and remediation necessary to re-energize lines and restore service to customers.
	Protocols in place to learn from wildfire events	Tools and procedures to monitor effectiveness of strategy and actions taken to prepare for emergencies and of strategy and actions taken during and after emergencies, including based on an accounting of the outcomes of wildfire events.
J. Stakeholder cooperation and community engagement	Community engagement	Strategy and actions taken to identify and contact key community stakeholders; increase public awareness and support of utility wildfire mitigation activity; and design, translate, distribute, and evaluate effectiveness of related communications. Includes specific strategies and actions taken to address concerns and serve needs of Access and Functional Needs populations and Limited English Proficiency populations in particular.
	Cooperation and best practice sharing with agencies outside CA	Strategy and actions taken to engage with agencies outside of California to exchange best practices both for utility wildfire mitigation and for stakeholder cooperation to mitigate and respond to wildfires.
	Cooperation with suppression agencies	Coordination with CAL FIRE, federal fire authorities, county fire authorities, and local fire authorities to support planning and operations, including support of aerial and ground firefighting in real-time, including information-sharing, dispatch of resources, and dedicated staff.
	Forest service and fuel reduction cooperation and joint roadmap	Strategy and actions taken to engage with local, state, and federal entities responsible for or participating in forest management and fuel reduction activities; and design utility cooperation strategy and joint stakeholder roadmap (plan for coordinating stakeholder efforts for forest management and fuel reduction activities).

(End of Appendix D)

APPENDIX E

Public Utilities Code Section 8386

8386.

(a) Each electrical corporation shall construct, maintain, and operate its electrical lines and equipment in a manner that will minimize the risk of catastrophic wildfire posed by those electrical lines and equipment.

(b) Each electrical corporation shall annually prepare and submit a wildfire mitigation plan to the Wildfire Safety Division for review and approval. In calendar year 2020, and thereafter, the plan shall cover at least a three-year period. The division shall establish a schedule for the submission of subsequent comprehensive wildfire mitigation plans, which may allow for the staggering of compliance periods for each electrical corporation. In its discretion, the division may allow the annual submissions to be updates to the last approved comprehensive wildfire mitigation plan; provided, that each electrical corporation shall submit a comprehensive wildfire mitigation plan at least once every three years.

(c) The wildfire mitigation plan shall include all of the following:

(1) An accounting of the responsibilities of persons responsible for executing the plan.

(2) The objectives of the plan.

(3) A description of the preventive strategies and programs to be adopted by the electrical corporation to minimize the risk of its electrical lines and equipment causing catastrophic wildfires, including consideration of dynamic climate change risks.

(4) A description of the metrics the electrical corporation plans to use to evaluate the plan's performance and the assumptions that underlie the use of those metrics.

(5) A discussion of how the application of previously identified metrics to previous plan performances has informed the plan.

(6) Protocols for disabling reclosers and deenergizing portions of the electrical distribution system that consider the associated impacts on public safety. As part of these protocols, each electrical corporation shall include protocols related to mitigating the public safety impacts of disabling reclosers and deenergizing portions of the electrical distribution system that consider the impacts on all of the following:

(A) Critical first responders.

(B) Health and communication infrastructure.

(C) Customers who receive medical baseline allowances pursuant to subdivision (c) of Section 739. The electrical corporation may deploy backup electrical resources or provide financial assistance for backup electrical resources to a customer receiving a medical baseline allowance for a customer who meets all of the following requirements:

(i) The customer relies on life-support equipment that operates on electricity to sustain life.

(ii) The customer demonstrates financial need, including through enrollment in the California Alternate Rates for Energy program created pursuant to Section 739.1.

(iii) The customer is not eligible for backup electrical resources provided through medical services, medical insurance, or community resources.

(D) Subparagraph (C) shall not be construed as preventing an electrical corporation from deploying backup electrical resources or providing financial assistance for backup electrical resources under any other authority.

(7) Appropriate and feasible procedures for notifying a customer who may be impacted by the deenergizing of electrical lines, including procedures for those customers receiving a medical baseline allowance as described in paragraph (6). The procedures shall direct notification to all public safety offices, critical first responders, health care facilities, and operators of telecommunications infrastructure with premises within the footprint of potential deenergization for a given event.
(8) Plans for vegetation management.
(9) Plans for inspections of the electrical corporation's electrical infrastructure.
(10) Protocols for the deenergization of the electrical corporation's transmission infrastructure, for instances when the deenergization may impact customers who, or entities that, are dependent upon the infrastructure.
(11) A list that identifies, describes, and prioritizes all wildfire risks, and drivers for those risks, throughout the electrical corporation's service territory, including all relevant wildfire risk and risk mitigation information that is part of the Safety Model Assessment Proceeding and the Risk Assessment Mitigation Phase filings. The list shall include, but not be limited to, both of the following:

(A) Risks and risk drivers associated with design, construction, operations, and maintenance of the electrical corporation's equipment and facilities.

(B) Particular risks and risk drivers associated with topographic and climatological risk factors throughout the different parts of the electrical corporation's service territory.

(12) A description of how the plan accounts for the wildfire risk identified in the electrical corporation's Risk Assessment Mitigation Phase filing.
(13) A description of the actions the electrical corporation will take to ensure its system will achieve the highest level of safety, reliability, and resiliency, and to ensure that its system is prepared for a major event, including hardening and modernizing its infrastructure with improved engineering, system design, standards, equipment, and facilities, such as undergrounding, insulation of distribution wires, and pole replacement.
(14) A description of where and how the electrical corporation considered undergrounding electrical distribution lines within those areas of its service territory identified to have the highest wildfire risk in a commission fire threat map.
(15) A showing that the electrical corporation has an adequately sized and trained workforce to promptly restore service after a major event, taking into account employees of other utilities pursuant to mutual aid agreements and employees of entities that have entered into contracts with the electrical corporation.
(16) Identification of any geographic area in the electrical corporation's service territory that is a higher wildfire threat than is currently identified in a commission fire threat map, and where the commission should consider expanding the high fire threat district based on new information or changes in the environment.
(17) A methodology for identifying and presenting enterprisewide safety risk and wildfire-related risk that is consistent with the methodology used by other electrical corporations unless the commission determines otherwise.
(18) A description of how the plan is consistent with the electrical corporation's disaster and emergency preparedness plan prepared pursuant to Section 768.6, including both of the following:

(A) Plans to prepare for, and to restore service after, a wildfire, including workforce mobilization and prepositioning equipment and employees.

(B) Plans for community outreach and public awareness before, during, and after a wildfire, including language notification in English, Spanish, and the top three primary languages used in the state other than English or Spanish, as determined by the commission based on the United States Census data.

(19) A statement of how the electrical corporation will restore service after a wildfire.

(20) Protocols for compliance with requirements adopted by the commission regarding activities to support customers during and after a wildfire, outage reporting, support for low-income customers, billing adjustments, deposit waivers, extended payment plans, suspension of disconnection and nonpayment fees, repair processing and timing, access to electrical corporation representatives, and emergency communications.

(21) A description of the processes and procedures the electrical corporation will use to do all of the following:

(A) Monitor and audit the implementation of the plan.

(B) Identify any deficiencies in the plan or the plan's implementation and correct those deficiencies.

(C) Monitor and audit the effectiveness of electrical line and equipment inspections, including inspections performed by contractors, carried out under the plan and other applicable statutes and commission rules.

(22) Any other information that the Wildfire Safety Division may require.

(d) The Wildfire Safety Division shall post all wildfire mitigation plans and annual updates on the commission's internet website for no less than two months before the division's decision regarding approval of the plan. The division shall accept comments on each plan from the public, other local and state agencies, and interested parties, and verify that the plan complies with all applicable rules, regulations, and standards, as appropriate.

(Amended by Stats. 2019, Ch. 410, Sec. 2.3. (SB 560) Effective January 1, 2020.)

(End of Appendix E)

APPENDIX F

Glossary of Terms

Glossary of Terms

Term	Definition
AB	Assembly Bill
AFN	Access and Functional Needs
ALJ	Administrative Law Judge
BVES	Bear Valley Electric Service
CAISO	California Independent System Operator
Cal Advocates	Public Advocate's Office
CAL FIRE	California Department of Forestry and Fire Protection
CEJA	California Environmental Justice Alliance
CNRA	California Natural Resources Agency
D.	Decision
DFA	Distribution Fault Attribution
EBMUD	East Bay Municipal Utility District
EFD	Early Fault Detection
EPIC	Electric Program Investment Charge
EPUC	Energy Producers and Users Coalition
EVM	Enhanced Vegetation Management
FERC	Federal Energy Regulatory Commission
FGDC	Federal Geographic Data Committee
FIRIS	Fire Integrated Real Time Intelligence System
FMEA	Failure Modes and Effects Analysis
FPI	Fire Potential Index
GIS	Geographic Information Systems
GO	General Order
GPI	Green Power Institute
GRC	General Rate Case
HFRA	High Fire Risk Area
HFTD	High Fire Threat District
Horizon West	Horizon West Transmission
HWT	Horizon West Transmission
I.	Investigation
ICS	Incident Command System
ICS	Incident Command Structure
IOU	Investor Owned Utility
ISA	International Society of Arboriculture
ITO	Independent Transmission Operator
IVM	Integrated Vegetation Management Plan
IVR	Interactive Voice Response
JIS	Joint Information System
kV	Kilovolt
Liberty	Liberty Utilities / CalPeco Electric
LiDAR	Light Detection and Ranging
LTE	Long-Term Evolution
Maturity Model	Utility Wildfire Mitigation Maturity Model
MAVF	Multi-Attribute Value Function
MGRA	Mussey Grade Road Alliance
MMAA	Mountain Mutual Aid Association
NERC	North American Electric Reliability Corporation
NFDRS	National Fire Danger Rating System
OCFA	Orange County Fire Authority
OEIS	Office of Energy Infrastructure Safety
OP	Ordering Paragraph
OPW	Outage Producing Winds
PG&E	Pacific Gas and Electric Company
PLP	Pole Loading Assessment Program
PMO (PacifiCorp)	Project Management Office
PMO (SCE)	Public Safety Program Management Office
PMU	Phasor Measurement Unit
POC	Protect Our Communities Foundation
PRC	Public Resources Code
PSPS	Public Safety Power Shutoff
QA	Quality Assurance
QC	Quality Control
R.	Rulemaking

Glossary of Terms

Term	Definition
RAMP	Risk Assessment and Management Phase
RAR	Remote Automatic Reclosers
RBDM	Risk-Based Decision Making
RCP	Remedial Compliance Plan
RCRC	Rural Counties of California Representatives
REFCL	Rapid Earth Fault Current Limiter
RFW	Red Flag Warning
RSE	Risk Spend Efficiency
SB	Senate Bill
SCADA	Supervisory Control and Data Acquisition
SCE	Southern California Edison Company
SDG&E	San Diego Gas & Electric Company
S-MAP	Safety Model Assessment Proceeding
SMJU	Small and Multijurisdictional Utility
SUI	Wildland-Urban Interface
SWATI	Santa Ana Wildfire Threat Index
TAT	Tree Assessment Tool
TBC	Trans Bay Cable
TURN	The Utility Reform Network
USFS	United States Forest Service
WMP	Wildfire Mitigation Plan
WRRM	Wildfire Risk Reduction Model
WSAB	Wildfire Safety Advisory Board
WSD	Wildfire Safety Division
WSIP	Wildfire Safety Inspection Program

(End of Appendix F)