

APPENDIX A

Deficiencies and Conditions

Guidance-1	Lack of risk spend efficiency (RSE) information
Class	B
Deficiency	<p>2020 WMP submissions contain sparse and sporadic detail regarding the RSE of WMP initiatives. RSE calculations are critical for determining whether utilities are effectively allocating resources to initiatives that provide the greatest risk reduction benefits per dollar spent, thus ensuring responsible use of ratepayer funds. Although RSE concepts have been considered for several years through Commission GRCs, utilities still display unrefined and limited abilities to produce such information. Considering that utilities propose to spend billions of dollars on WMP initiatives, not having quantifiable information on how those initiatives reduce utility ignition risk relative to their cost severely limits the WSD's ability to evaluate the efficacy of such initiatives and each utility's portfolio of initiatives, as outlined in 2020 WMPs.</p> <p>Further, RSE is not an appropriate tool for justifying the use of PSPS. When calculating RSE for PSPS, electrical corporations generally assume 100% wildfire risk mitigation and very low implementation costs because societal costs and impact are not included. When calculated this way, PSPS will always rise to the top as a wildfire mitigation tool, but it will always fail to account for its true costs to customers. Therefore, electrical corporations shall not rely on RSE calculations as a tool to justify the use of PSPS.</p>
Condition	<p>In its first quarterly report, each electrical corporation shall provide the following:</p> <ul style="list-style-type: none"> i. its calculated reduction in ignition risk for each initiative in its 2020 WMP; ii. its calculated reduction in wildfire consequence risk for each initiative in its 2020 WMP; and iii. the risk models used to calculate (i) and (ii) above.

Guidance-2	Lack of alternatives analysis for chosen initiatives
Class	B
Deficiency	2020 WMP submissions contain little to no detail regarding utilities' process for comparing potential WMP initiatives. While most WMP initiatives are generally assumed to reduce utility wildfire risk, there are typically several alternatives that can address specific drivers of utility ignitions and near misses. However, 2020 WMPs generally do not include any discussion of which alternatives were considered, how the utility evaluated the efficacy of each alternative, and how the utility ultimately decided upon the suite of initiatives presented in its 2020 WMP.
Condition	In its first quarterly report, each electrical corporation shall provide the following: <ul style="list-style-type: none"> i. all alternatives considered for each grid hardening or vegetation management initiative in its 2020 WMP; ii. all tools, models, and other resources used to compare alternative initiatives; iii. how it quantified and determined the risk reduction benefits of each initiative; and iv. why it chose to implement each initiative over alternative options.

Guidance-3	Lack of risk modeling to inform decision-making
Class	A
Deficiency	<p>Electrical corporations do not provide sufficient detail in their 2020 WMPs to demonstrate how they are leveraging risk models to target the highest risk portions of the grid. While most utilities indicate current progress and work on developing models to estimate risk across their service territories, there is a lack of focus on how these models can be used in practice to prioritize initiatives to address specific ignition drivers and geographies. Specifically, utilities fail to outline in detail how they determine where to prioritize to improve asset management or determine portions of circuits that would benefit the most from hardening and vegetation management.</p> <p>By continuing to improve wildfire risk modeling and basing its wildfire mitigations on its wildfire risk modeling outputs, electrical corporations can potentially achieve a greater level of risk reduction with the same resources.</p>
Condition	<p>Each electrical corporation shall submit in its remedial correction plan (RCP) the following:</p> <ol style="list-style-type: none"> how it intends to apply risk modeling and risk assessment techniques to each initiative in its WMP, with an emphasis on much more targeted use of asset management, vegetation management, grid hardening and PSPS based on wildfire risk modeling outputs; identify all wildfire risk analyses it currently performs (including probability and consequence modeling) to determine which mitigation is targeted to circuits and assets where initiatives will provide the greatest benefit to wildfire risk reduction; a timeline to leverage its risk modeling outputs to prioritize and target initiatives and set PSPS thresholds, including at least asset management, grid operations, vegetation management, and system hardening initiatives; how it intends to incorporate future improvements in risk modeling into initiative prioritization and targeting processes; and how it intends to adapt its approach based on learnings going forward.

Guidance-4	Lack of discussion on PSPS impacts
Class	B
Deficiency	Across 2020 WMP submissions, utilities indicate goals of reducing the scope, frequency and duration of PSPS events but also indicate intentions of continuing to implement PSPS as a wildfire mitigation measure in the immediate future. Considering the rapid expansion of PSPS use as a wildfire mitigation measure, and the numerous hardships, inconveniences and hazards created by its vast implementation, it is concerning that 2020 WMPs provide no discussion of how the chosen portfolio of initiatives will allow the utility to achieve its goals for reducing PSPS impacts. Specifically, no 2020 WMPs discuss the relationship between various grid hardening, vegetation management, and asset management initiatives and the corresponding impacts on thresholds for initiating PSPS events.
Condition	<p>In its first quarterly report, each electrical corporation shall detail whether and how each initiative in its WMP:</p> <ul style="list-style-type: none"> i. affects its threshold values for initiating PSPS events; ii. is expected to reduce the frequency (i.e. number of events) of PSPS events; iii. is expected to reduce the scope (i.e. number of customers impacted) of PSPS events; iv. is expected to reduce the duration of PSPS events; and v. supports its directional vision for necessity of PSPS, as outlined in Section 4.4 of its WMP.

Guidance-5	Aggregation of initiatives into programs
Class	B
Deficiency	In their 2020 WMP submissions, electrical corporations often combine various initiatives into broader programs and report cost, risk and other related data at the program level. This aggregation of initiatives and bundled reporting creates several issues. First, because cost data is typically reported across programs and not individual initiatives, it is not possible for the WSD to evaluate the efficacy of each initiative. Second, when initiatives are bundled and reported together as programs, it prevents the WSD from being able to assess which initiatives are effectively reducing utility wildfire risk. Consequently, this creates the challenge that ineffective elements of broad programs cannot be determined and future considerations of initiatives within programs can only be done collectively.
Condition	In its first quarterly report, each electrical corporation shall: <ul style="list-style-type: none"> i. break out its programs outlined in section 5.3 into individual initiatives; ii. report its spend on each individual initiative; iii. describe the effectiveness of each initiative at reducing ignition probability or wildfire consequence; iv. list all data and metrics used to evaluate effectiveness described in (iii), including the threshold values used to differentiate between effective and ineffective initiatives; and v. provide the information required for each initiative in section 5.3 of the Guidelines.

Guidance-6	Failure to disaggregate WMP initiatives from standard operations
Class	B
Deficiency	<p>While WMPs are designed to outline and detail filer’s plans and initiatives for mitigating wildfire risk, many existing programs also provide wildfire risk reduction benefits. For example, General Order 165 requires annual patrol inspections and detailed inspections every five years for electrical infrastructure. These programs and initiatives are often referenced in 2020 WMPs as “supporting,” “routine,” “enabling,” “standard,” or “foundational” work. For these types of programs, in most cases, electrical corporations do not report cost or risk reduction data, as the work is considered part of their electric operations and it is indicated that this information is not tracked independently.</p> <p>Several electrical corporations state that their programs for inspecting and maintaining crossarms, poles, transformers, transmission towers and similar infrastructure, which also reduce wildfire risk, are embedded within standard maintenance programs litigated in GRCs. Consequently, it is difficult to determine whether and how these programs incrementally impact wildfire risk reduction or if related WMP initiatives are redundant and unnecessary. While utilities may not have historically considered the costs and effectiveness of such programs and initiatives, given that numerous WMP initiatives have apparent overlap or potential redundancy, it is imperative that utilities provide such data to validate the need for and effectiveness of additional programs.</p> <p>It is not clear how electrical corporations are tracking their WMP activities in memorandum accounts if they do not budget for them by type of initiative. The Commission will scrutinize electrical corporations’ memorandum accounts for WMP carefully, and if all costs are simply lumped together or included in general operations and maintenance accounts, electrical corporations risk failing to provide entitlement to cost recovery.</p>
Condition	<p>In its first quarterly report, each electrical corporation shall:</p> <ol style="list-style-type: none"> i. clearly identify each initiative in Section 5.3 of its WMP as “Standard Operations” or “Augmented Wildfire Operations;” ii. report WMP required data for all Standard Operations and Augmented Wildfire Operations; iii. confirm that it is budgeting and accounting for WMP activity of each initiative; and iv. include a “ledger” of all subaccounts that show a breakdown by initiative.

Guidance-7	Lack of detail on effectiveness of “enhanced” inspection programs
Class	B
Deficiency	Utilities engage in numerous ‘enhanced’ inspection programs, but it is unclear if such ‘enhanced’ programs are incrementally effective over routine patrol and detailed inspections, particularly if patrol and detail inspections are scheduled based on risk rather than GO 95 minimums.
Condition	<p>In its first quarterly report, each electrical corporation shall detail:</p> <ul style="list-style-type: none"> i. the incremental quantifiable risk identified by such ‘enhanced’ inspection programs; ii. whether it addresses the findings uncovered by ‘enhanced’ programs differently than findings discovered through existing inspections; and iii. a detailed cost-benefit analysis of combining elements of such ‘enhanced’ inspections into existing inspection programs.

Guidance-8	Prevalence of equivocating language – failure of commitment
Class	C
Deficiency	<p>While there have been many improvements and advancements reflected in 2020 WMPs, a key concern remains regarding discussion of WMP objectives and the prevalent use of “equivocating language” to avoid making measurable, quantifiable, and verifiable commitments. While electrical corporations make promises to quantifiably reduce PSPS impacts and the frequency of near misses and ignitions, other promises are far less specific. Terms such as, “track,” “assess,” “evaluate,” and “evolve” are repeated hundreds of times throughout the 2020 WMPs. Without sufficient details, none of these terms provide the WSD or the public with a measurable, quantifiable, and verifiable goal against which electrical corporations could be held.</p>
Condition	<p>In its 2021 WMP update, each electrical corporation shall:</p> <ul style="list-style-type: none"> i. include objectives for each of its initiatives that are measurable, quantifiable, and verifiable by the WSD; ii. provide targets and timelines for all strategies, plans, and approaches to wildfire mitigation that are measurable, quantifiable and verifiable by the WSD; and iii. dispense with empty rhetoric and not use terms that are ambiguous, misleading, or otherwise have the result of diluting commitments. Continued use of equivocating language may result in denial of future WMPs.

Guidance-9	Insufficient discussion of pilot programs
Class	B
Deficiency	Electrical corporations do not describe how they will evaluate and expand the use of successfully piloted technology or which piloted technology has proven ineffective. To ensure pilots that are successful result in expansion, if warranted and justified with quantitative data, electrical corporations must evaluate each pilot or demonstration and describe how it will expand use of successful pilots.
Condition	<p>In its quarterly report, each electrical corporation shall detail:</p> <ul style="list-style-type: none"> i. all pilot programs or demonstrations identified in its WMP; ii. status of the pilot, including where pilots have been initiated and whether the pilot is progressing toward broader adoption; iii. results of the pilot, including quantitative performance metrics and quantitative risk reduction benefits; iv. how the electrical corporation remedies ignitions or faults revealed during the pilot on a schedule that promptly mitigates the risk of such ignition or fault, and incorporates such mitigation into its operational practices; and v. a proposal for how to expand use of the technology if it reduces ignition risk materially.

Guidance-10	Data issues – general
Class	B
Deficiency	<p>Although the availability of data, including GIS data, provides unprecedented insight into utility infrastructure and operations, inconsistencies and gaps in the data present a number of challenges and hurdles. As it relates to GIS data, electrical corporation submissions often had inconsistent file formats and naming conventions, contained little to no metadata, were incomplete or missing many data attributes and utilized varying schema. These deficiencies rendered cross-utility comparisons impossible without substantive, resource- and time-consuming manipulation of the data. Additional data challenges included varying interpretations of WMP Guideline data requirements, leading to inconsistency of data submitted.</p>
Condition	<p>Electrical corporations shall ensure that all future data submissions to the WSD adhere to the forthcoming data taxonomy and schema currently being developed by the WSD. Additionally, each electrical corporation shall file a quarterly report detailing:</p> <ol style="list-style-type: none"> i. locations where grid hardening, vegetation management, and asset inspections were completed over the prior reporting period, clearly identifying each initiative and supported with GIS data, ii. the type of hardening, vegetation management and asset inspection work done, and the number of circuit miles covered, supported with GIS data iii. the analysis that led it to target that specific area and hardening, vegetation management or asset inspection initiative, and iv. hardening, vegetation management, and asset inspection work scheduled for the following reporting period, with the detail in (i) – (iii).

Guidance-11	Lack of detail on plans to address personnel shortages
Class	B
Deficiency	Electrical corporations 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 in areas of personnel shortage.
Condition	<p>In its first quarterly report, each electrical corporation shall detail:</p> <ul style="list-style-type: none"> i. a listing and description of its programs for recruitment and training of personnel, including for vegetation management; ii. a description of its strategy for direct recruiting and indirect recruiting via contractors and subcontractors; and iii. its metrics to track the effectiveness of its recruiting programs, including metrics to track the percentage of recruits that are newly trained, percentage from out of state, and the percentage that were working for another California utility immediately prior to being hired.

Guidance-12	Lack of detail on long-term planning
Class	B
Deficiency	Electrical corporations do not provide sufficient detail regarding long-term wildfire mitigation plans and how the initiatives in their WMPs align with and support those long-term plans.
Condition	<p>In their first quarterly report, each electrical corporations shall detail:</p> <ul style="list-style-type: none"> i. its expected state of wildfire mitigation in 10 years, including 1) a description of wildfire mitigation capabilities in 10 years, 2) a description of its grid architecture, lines, and equipment; ii. a year-by-year timeline for reaching these goals; iii. a list of activities that will be required to achieve this end goal; and iv. a description of how the electrical corporation's three-year WMP is a step on the way to this 10-year goal.

(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 17 th , 2020
SCE	Revision 02 to WMP
SDG&E	Update to WMP submitted March 10 th , 2020
Liberty CalPeco	Update to WMP submitted February 28 th , 2020
PacifiCorp	Update to WMP submitted February 26 th , 2020
Bear Valley Electric Service	Update to WMP submitted February 26 th , 2020
Horizon West Transmission	Update to WMP submitted February 28 th , 2020
Trans Bay Cable	Update to WMP submitted February 28 th , 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	B5
FIGURE 1.1A: COMPARISON OF DATA SOURCES FOR CIRCUIT TYPOLOGIES.....	B5
FIGURE 1.1B: CIRCUIT TOPOLOGY BREAKDOWN BY OVERHEAD AND UNDERGROUND CIRCUIT MILES	B6
FIGURE 1.2A: OVERHEAD CIRCUIT MILES BY HFTD TIER (LARGE UTILITIES)	B7
FIGURE 1.2B: OVERHEAD CIRCUIT MILES BY HFTD TIER (SMALL UTILITIES)	B8
FIGURE 1.3A: BREAKDOWN OF OVERHEAD TRANSMISSION AND DISTRIBUTION CIRCUIT MILES BY HFTD AND WUI LOCATION (LARGE UTILITIES)	B9
FIGURE 1.3B: BREAKDOWN OF OVERHEAD TRANSMISSION AND DISTRIBUTION CIRCUIT MILES BY HFTD AND WUI LOCATION (SMALL UTILITIES)	B10
FIGURE 1.4A: BREAKDOWN OF OVERHEAD TRANSMISSION AND DISTRIBUTION CIRCUIT MILES BY HFTD AND POPULATION DENSITY (LARGE UTILITIES)	B11
FIGURE 1.4B: BREAKDOWN OF OVERHEAD TRANSMISSION AND DISTRIBUTION CIRCUIT MILES BY HFTD AND POPULATION DENSITY (SMALL UTILITIES)	B12
FIGURE 1.5A: RED FLAG WARNING CIRCUIT MILE DAYS PER YEAR BY UTILITY (LARGE UTILITIES)	B13
FIGURE 1.5B: RED FLAG WARNING CIRCUIT MILE DAYS PER YEAR BY UTILITY (SMALL UTILITIES).....	B14
FIGURE 1.5C: 95 TH AND 99 TH PERCENTILE WIND CONDITIONS (LARGE UTILITIES)	B15
FIGURE 1.5D: 95 TH AND 99 TH PERCENTILE WIND CONDITIONS (SMALL UTILITIES).....	B16
 1.2 OUTCOME METRICS.....	B17
FIGURE 2.1A: ASSET INSPECTION FINDINGS NORMALIZED BY TOTAL CIRCUIT MILEAGE (LARGE UTILITIES)	B17
FIGURE 2.1B: ASSET INSPECTION FINDINGS NORMALIZED BY TOTAL CIRCUIT MILEAGE (SMALL UTILITIES)	B18
FIGURE 2.2A: NEAR MISS INCIDENTS NORMALIZED BY OVERHEAD CIRCUIT MILEAGE (LARGE UTILITIES)	B19
FIGURE 2.2B: NEAR MISS INCIDENTS NORMALIZED BY OVERHEAD CIRCUIT MILEAGE (SMALL UTILITIES).....	B20
FIGURE 2.3A: NUMBER OF IGNITIONS, NORMALIZED BY OVERHEAD CIRCUIT MILEAGE (LARGE UTILITIES)	B21
FIGURE 2.3B: NUMBER OF IGNITIONS, NORMALIZED BY OVERHEAD CIRCUIT MILEAGE (SMALL UTILITIES).....	B22

FIGURE 2.4A: TOTAL IGNITIONS BY HFTD LOCATION (LARGE UTILITIES).....	B23
FIGURE 2.4B: TOTAL IGNITIONS BY HFTD LOCATION (SMALL UTILITIES)	B24
FIGURE 2.5A: IGNITIONS BY IGNITION PROBABILITY DRIVER TYPE (LARGE UTILITIES)	B25
FIGURE 2.5B: IGNITIONS BY IGNITION PROBABILITY DRIVER TYPE (SMALL UTILITIES)	B26
FIGURE 2.6A: DETAIL: SHARE OF IGNITIONS DUE TO EACH IGNITION PROBABILITY DRIVER (LARGE UTILITIES)	B27
FIGURE 2.6B: DETAIL: SHARE OF IGNITIONS DUE TO EACH IGNITION PROBABILITY DRIVER (SMALL UTILITIES)	B28
FIGURE 2.7A: ACTUAL AND PROJECTED IGNITIONS FOR TOP IGNITION DRIVERS, 2019 AND 2022	B29
FIGURE 2.7B: PG&E DETAIL: ACTUAL AND PROJECTED IGNITIONS FOR TOP IGNITION DRIVERS, 2019 AND 2022.....	B30
FIGURE 2.7C: SCE DETAIL: ACTUAL AND PROJECTED IGNITIONS FOR TOP IGNITION DRIVERS, 2019 AND 2022	B31
FIGURE 2.8A: NORMALIZED PSPS DURATION IN CUSTOMER HOURS (LARGE UTILITIES).....	B32
FIGURE 2.8B: NORMALIZED PSPS DURATION IN CUSTOMER HOURS (SMALL UTILITIES)	B33
FIGURE 2.8C: PSPS IMPACTS ON CRITICAL INFRASTRUCTURE	B34
FIGURE 2.9A: NORMALIZED AREA BURNED BY UTILITY IGNITED WILDFIRE (LARGE UTILITIES)	B35
FIGURE 2.9B: NORMALIZED AREA BURNED BY UTILITY IGNITED WILDFIRE (SMALL UTILITIES)	B36
FIGURE 2.10: NUMBER OF STRUCTURES DAMAGED BY UTILITY IGNITED WILDFIRE	B37
FIGURE 2.11: FATALITIES DUE TO UTILITY IGNITED WILDFIRE	B38

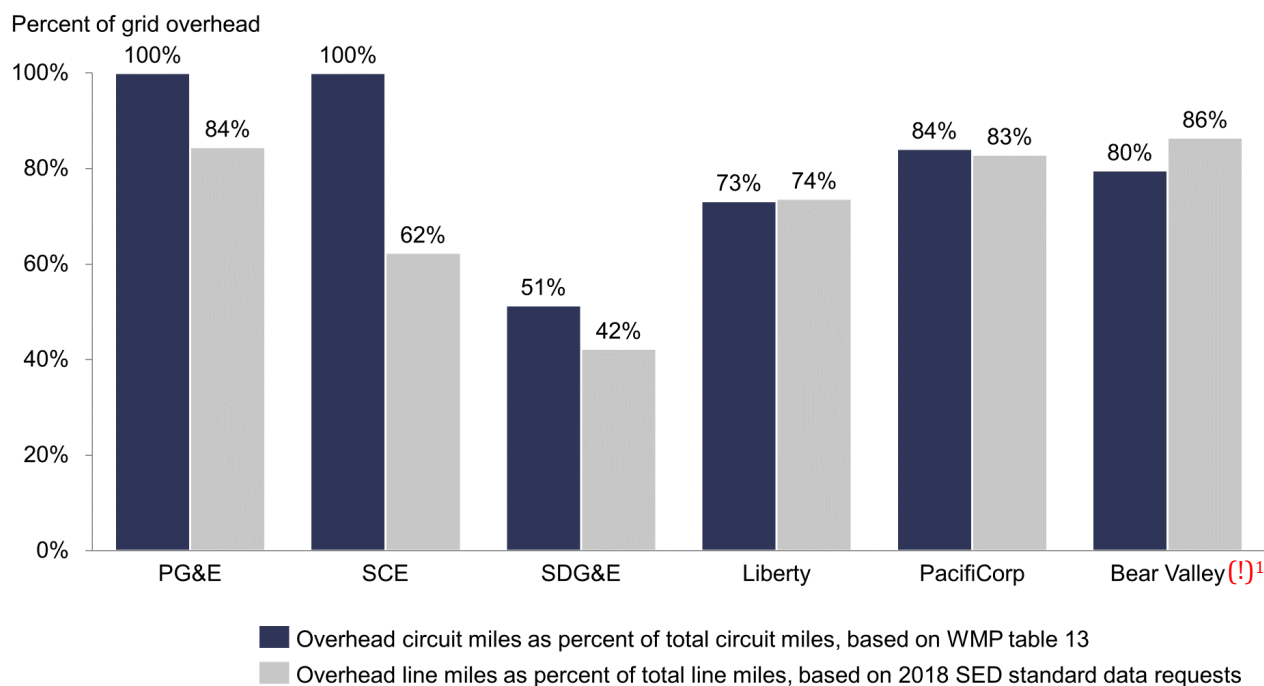
1.3 RESOURCE ALLOCATION..... B39

FIGURE 3.1A: OVERVIEW OF TOTAL PLAN SPEND ACROSS UTILITIES (LARGE UTILITIES)	B39
FIGURE 3.1B: OVERVIEW OF TOTAL PLAN SPEND ACROSS UTILITIES (SMALL UTILITIES)	B40
FIGURE 3.2A: OVERVIEW OF TOTAL PLAN SPEND ACROSS UTILITIES (LARGE UTILITIES)	B41
FIGURE 3.2B: OVERVIEW OF TOTAL PLAN SPEND ACROSS UTILITIES (SMALL UTILITIES)	B42
FIGURE 3.3A: BREAKDOWN OF PLANNED SPEND BY CATEGORY (LARGE UTILITIES)	B43
FIGURE 3.3B: BREAKDOWN OF PLANNED SPEND BY CATEGORY (SMALL UTILITIES)	B44
FIGURE 3.4A: PG&E RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND	B45
FIGURE 3.4B: PG&E RESOURCE ALLOCATION DETAIL FOR TOP 4 CATEGORIES BY PLANNED SPEND.....	B46
FIGURE 3.5A: SCE RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND	B47
FIGURE 3.5B: SCE RESOURCE ALLOCATION DETAIL FOR TOP 4 CATEGORIES BY PLANNED SPEND	B48
FIGURE 3.6A: SDG&E RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND.....	B49

FIGURE 3.6B: SDG&E RESOURCE ALLOCATION DETAIL FOR TOP 4 CATEGORIES BY PLANNED SPEND	B50
FIGURE 3.7: LIBERTY RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND	B51
FIGURE 3.8: PACIFICORP RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND	B52
FIGURE 3.9: BEAR VALLEY RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND.....	B53
FIGURE 3.10: HORIZON WEST TRANSMISSION ALLOCATION DETAIL FOR ALL PLANNED INITIATIVES	B54

1.1 Wildfire Risk Exposure

Figure 1.1a: Comparison of data sources for circuit typologies

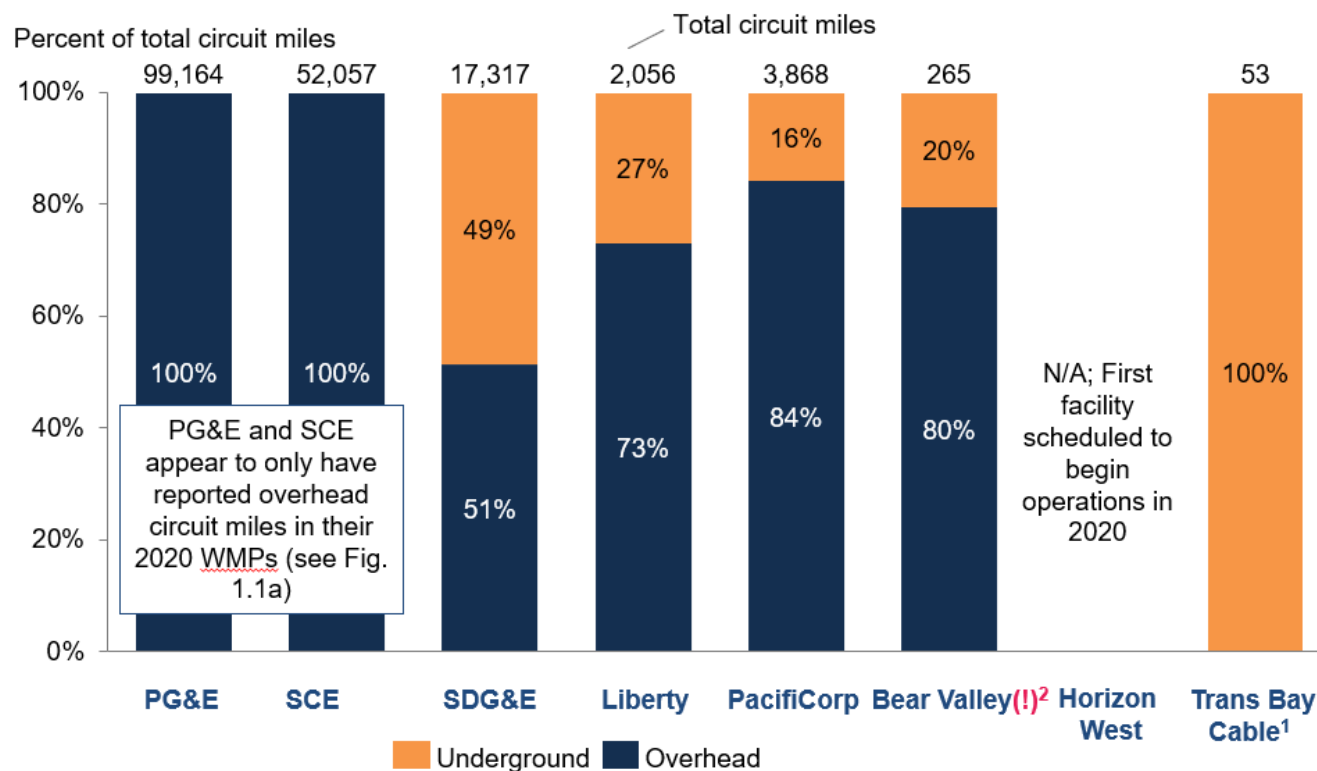


Note: In their 2020 WMPs, PG&E and SCE only reported circuit mileage data for overhead facilities. Based on the best available historical data on circuit mileage and grid topology in the Commission's possession, PG&E is reported to have 84% of its total line miles overhead, and SCE is reported to have 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

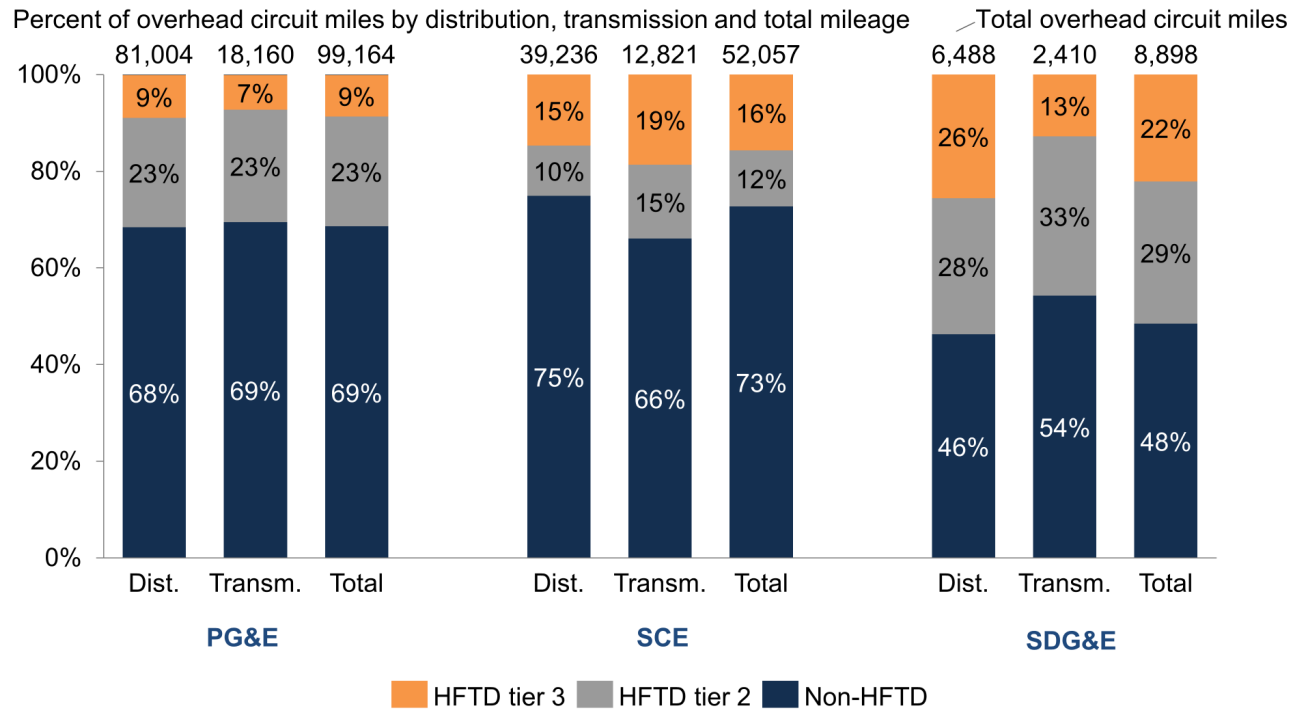
Figure 1.1b: Circuit topology breakdown by overhead and underground circuit miles



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

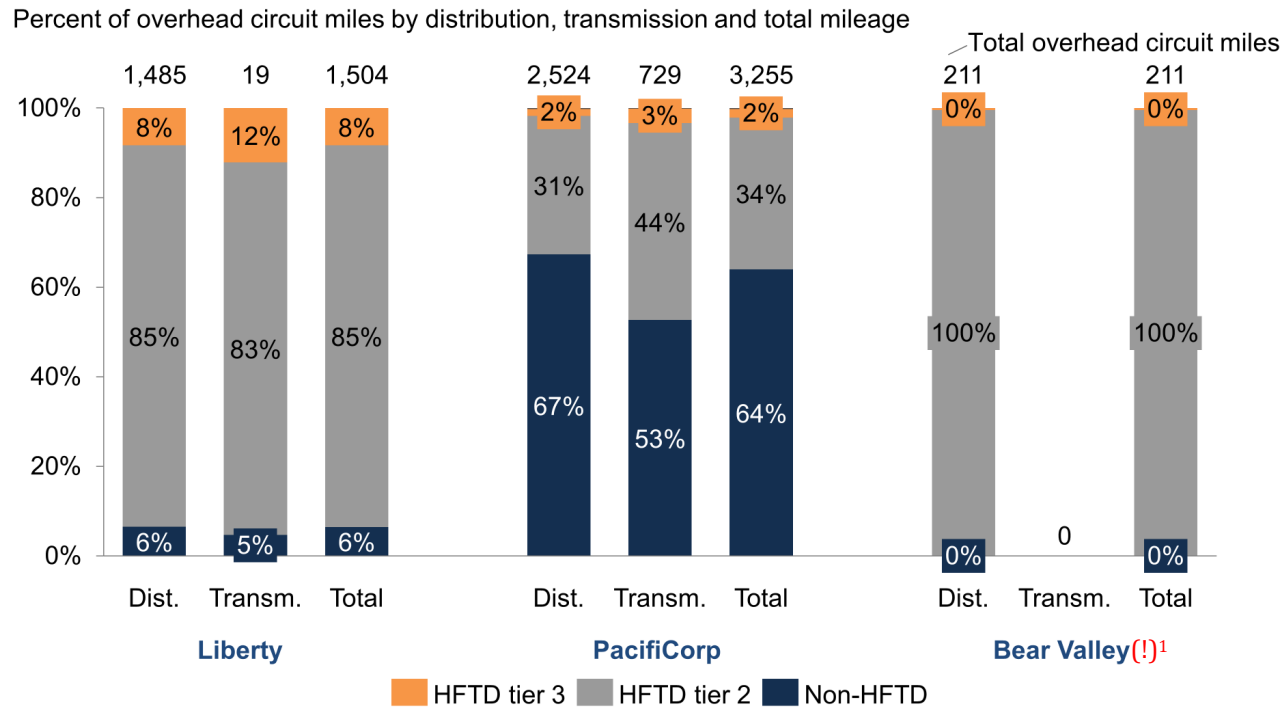
Figure 1.2a: Overhead circuit miles by HFTD Tier (Large Utilities)
Broken out by distribution (dist.) and transmission (transm.)



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.)

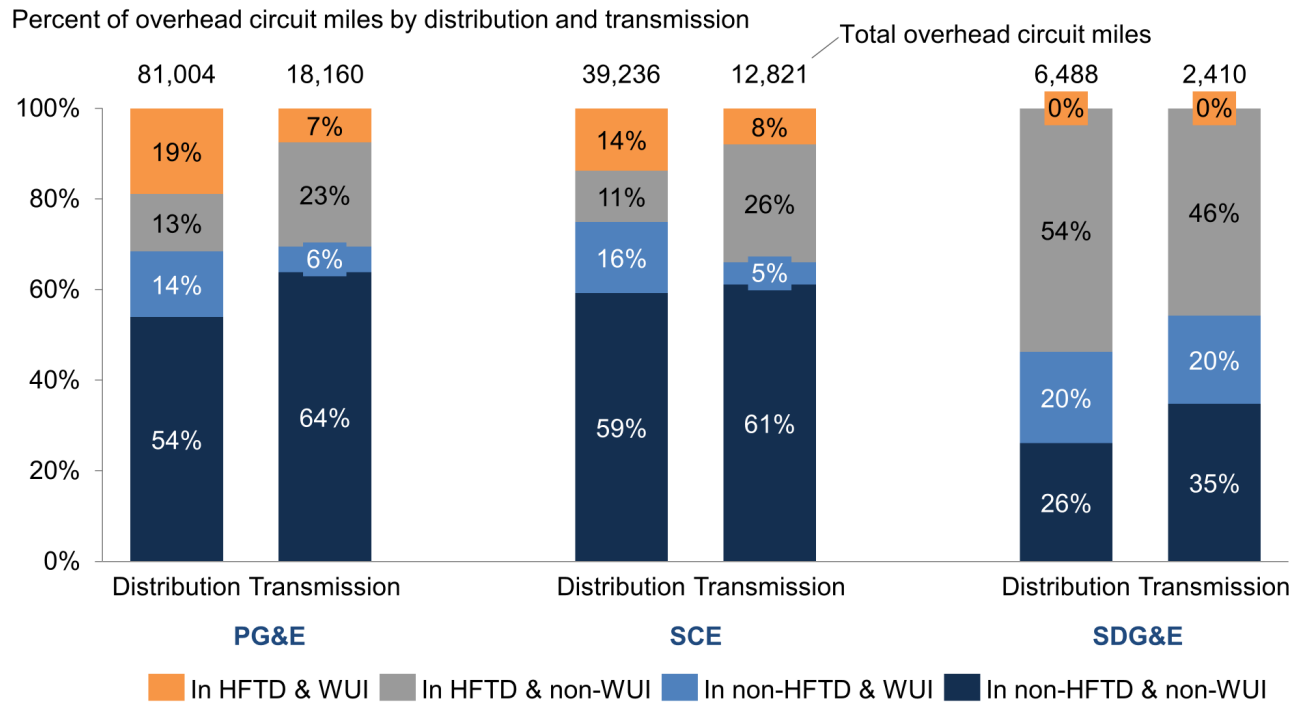


Note: Zone 1 not shown as subtotal.

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

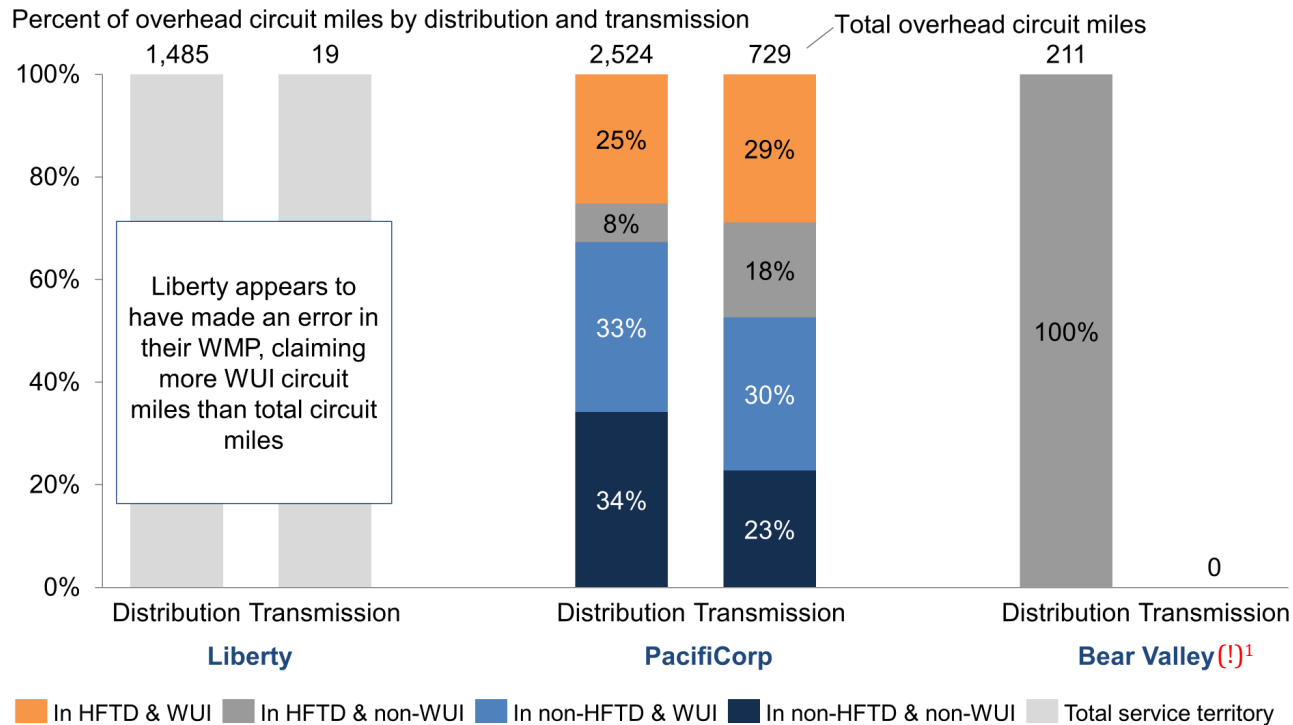
Source: WMP Table 13

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)

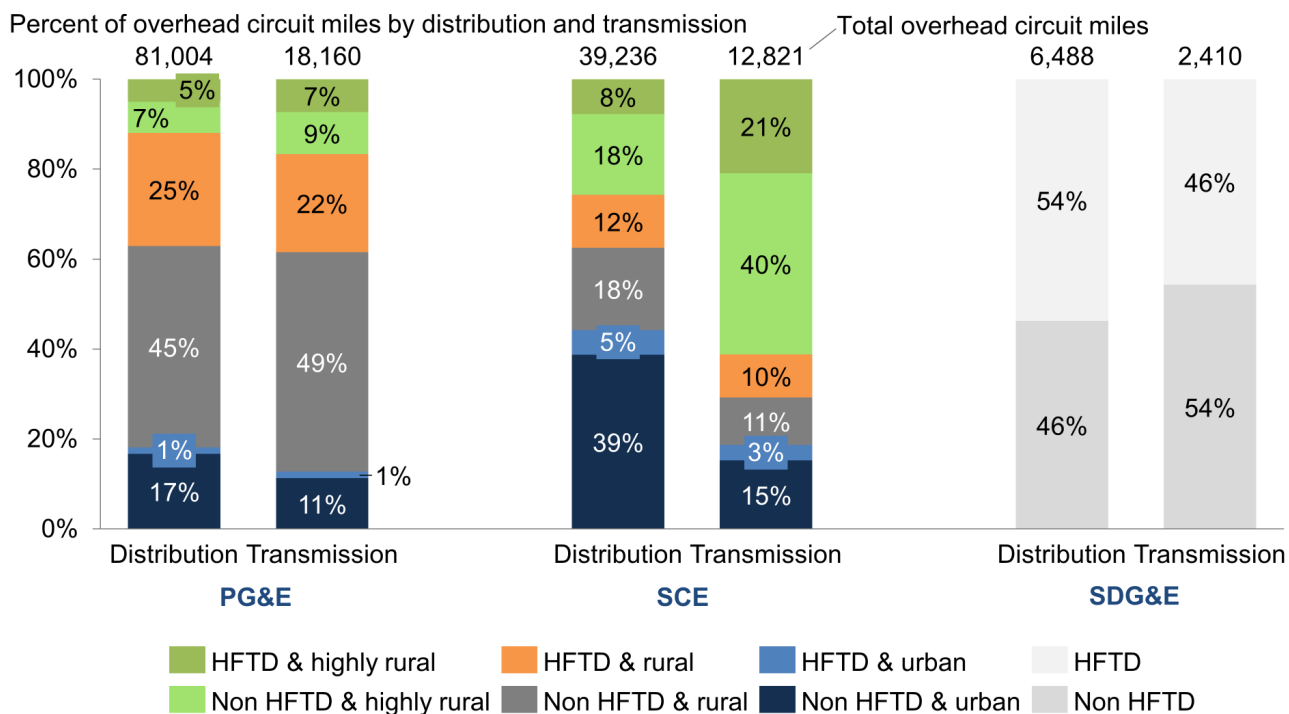


Note: Trans Bay Cable and Horizon West Transmission are not shown. Trans Bay Cable is almost entirely underground and submarine, and Horizon West Transmission did not yet have operational facilities at the time it submitted its 2020 WMP.

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

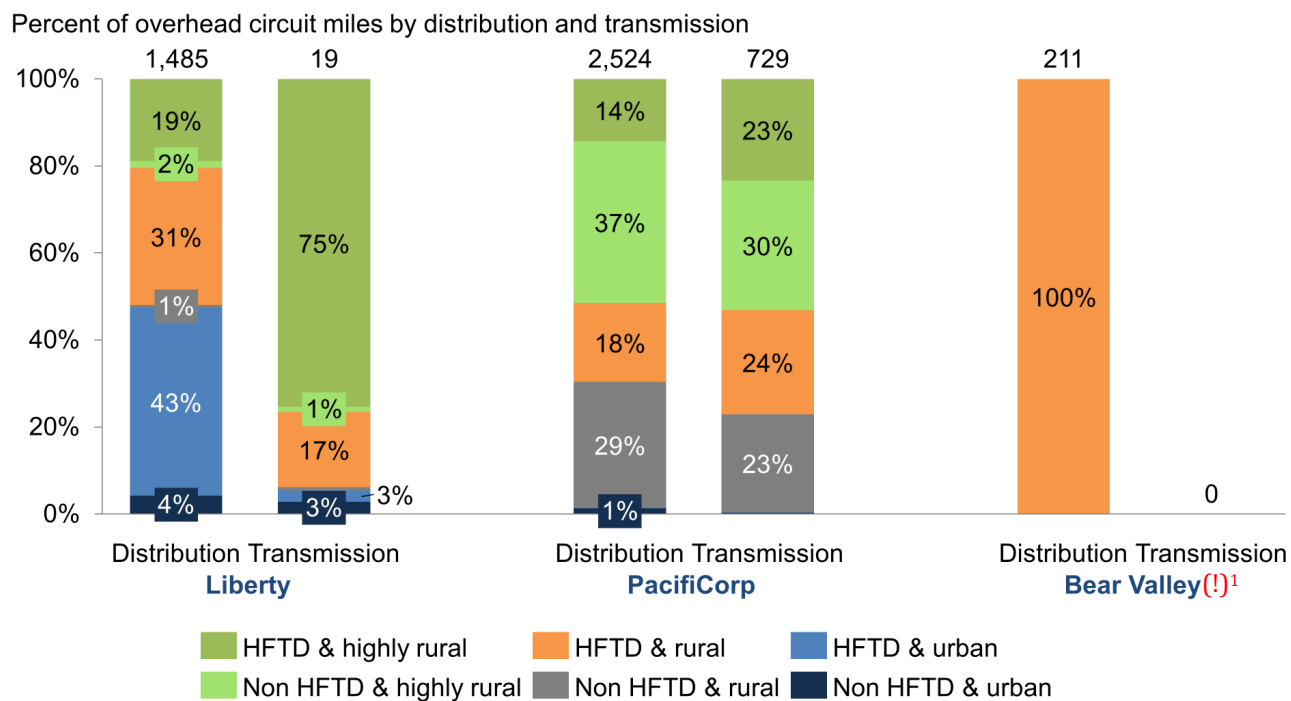
Figure 1.4a: Breakdown of overhead transmission and distribution circuit miles by HFTD and population density (Large utilities)



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

Source: WMP Table 13

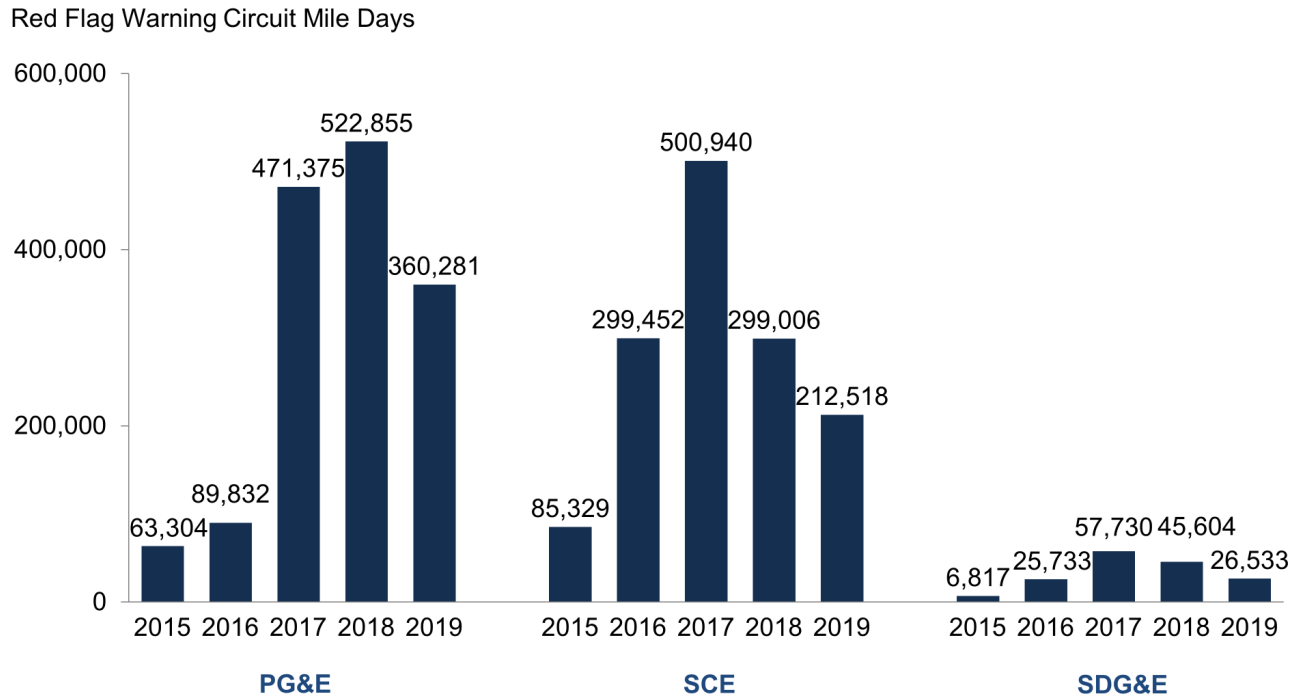
Figure 1.4b: Breakdown of overhead transmission and distribution circuit miles by HFTD and population density (Small utilities)



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

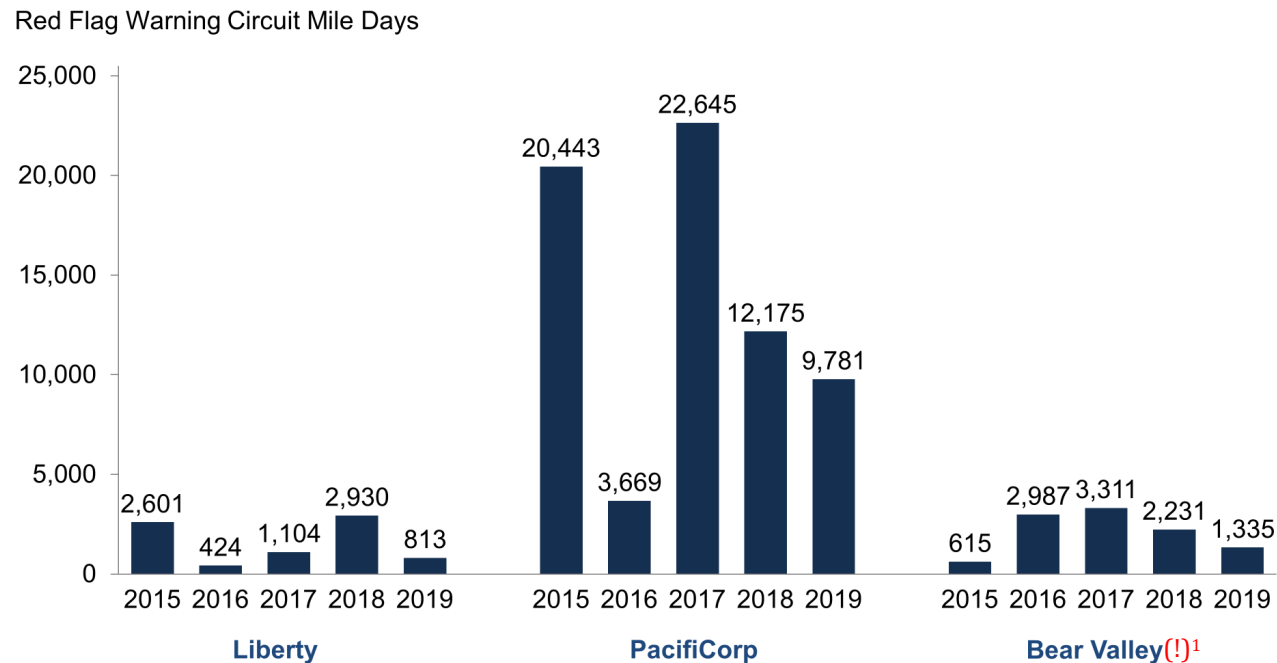
Figure 1.5a: Red flag warning circuit mile days per year by utility (Large utilities)



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)

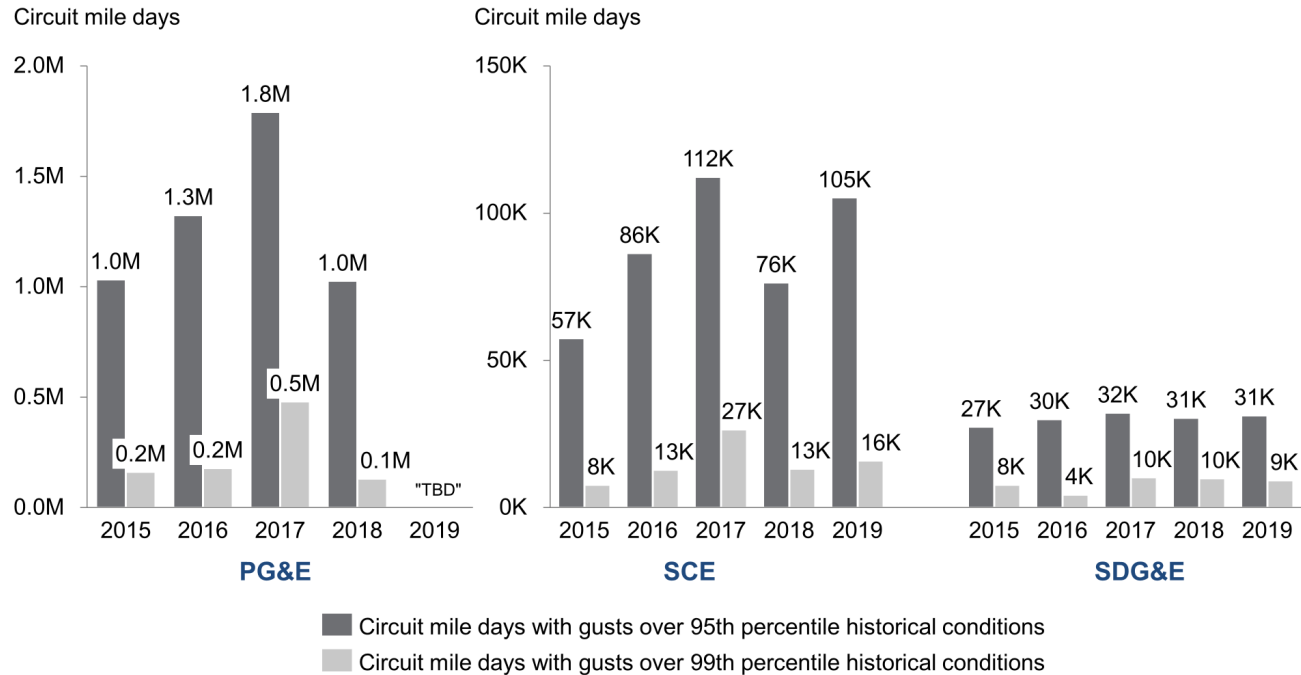


Note: A “Red Flag Warning (RFW) Circuit Mile Day” is intended to capture the duration and scope of the fire weather that year. It is defined on page 5 of the 2020 WMP Guidelines to be calculated as the number of circuit miles that were under a RFW multiplied by the number of days those miles were under 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

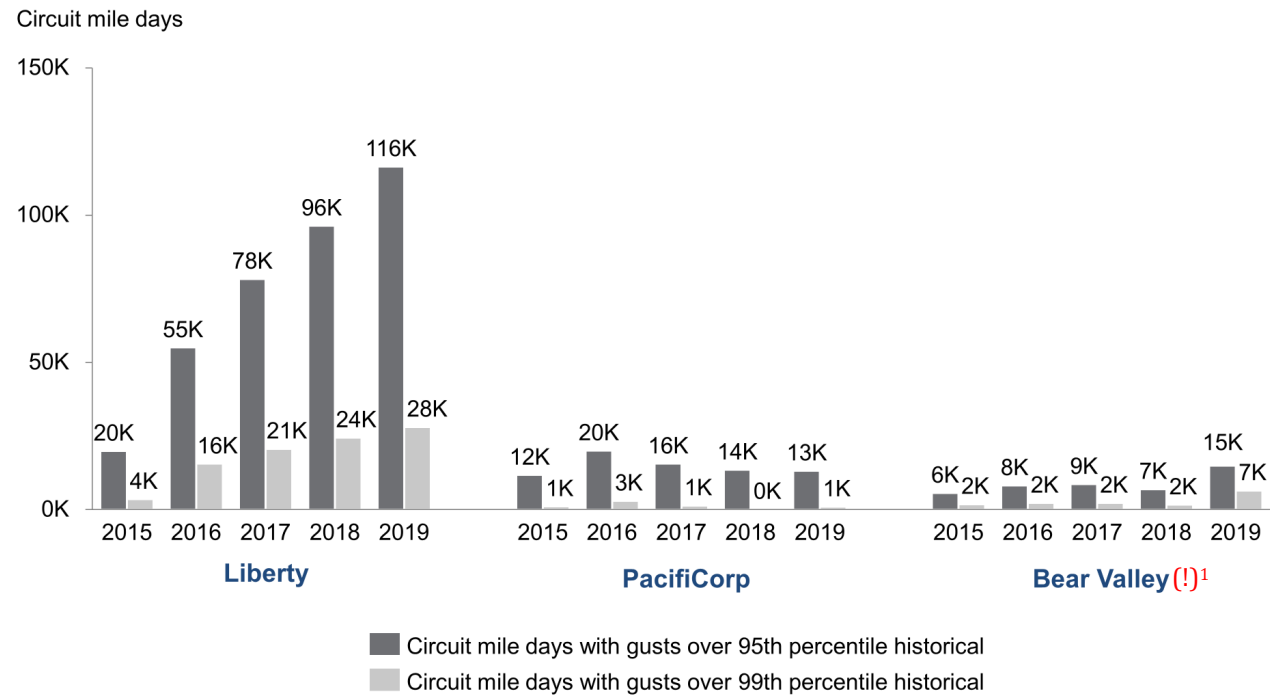
Figure 1.5c: 95th and 99th percentile wind conditions (Large utilities)



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.

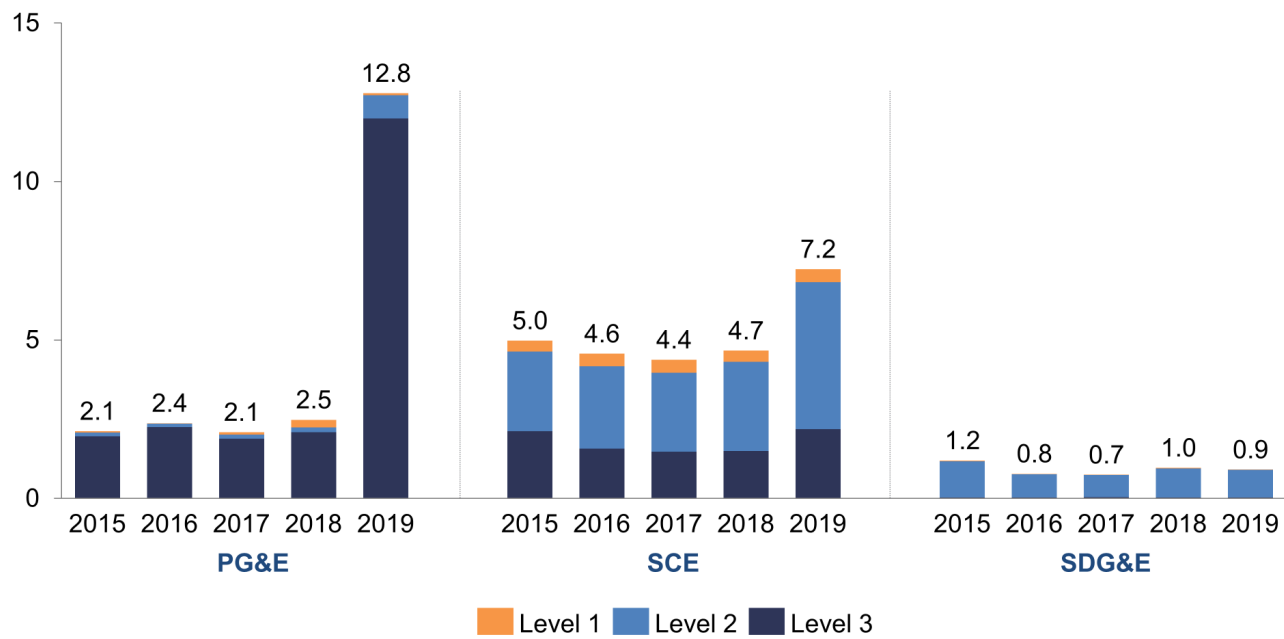
1. BVES submitted errata on 5/20/2020 that changed their WMP. Those updates are not reflected here (WSD analysis forthcoming).

Source: WMP Table 10

1.2 Outcome Metrics

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

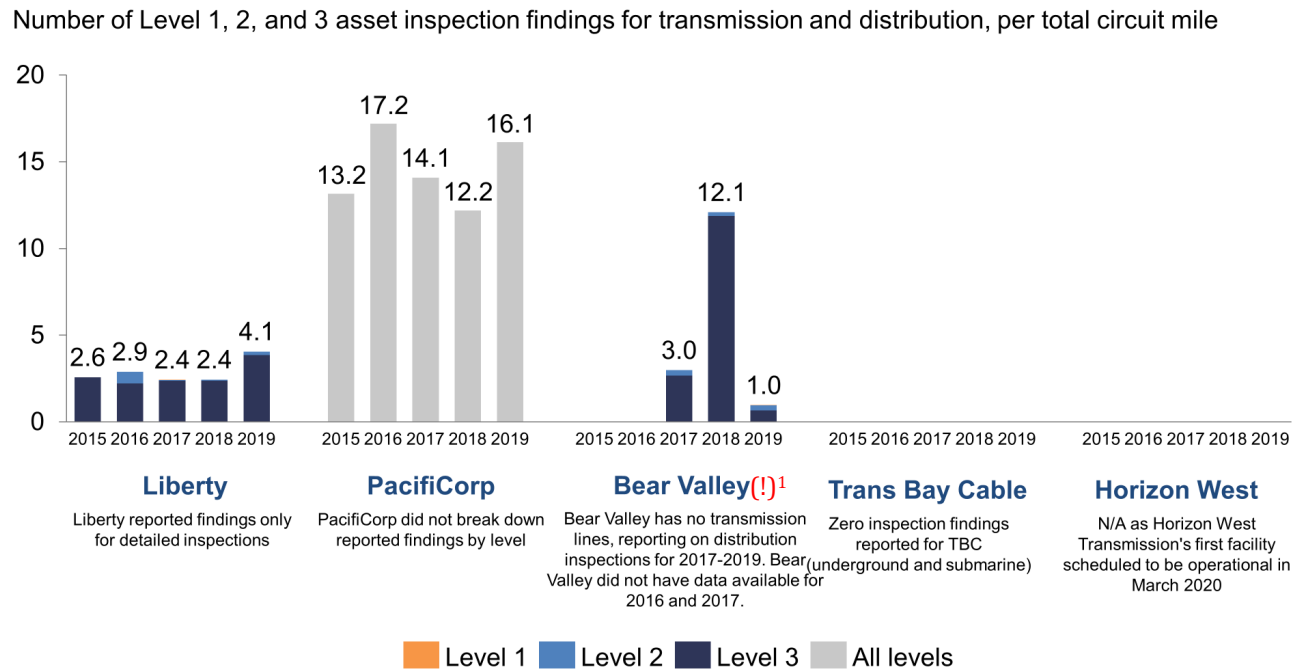
Number of Level 1, 2, and 3 asset inspection findings for transmission and distribution, per total circuit mile



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)

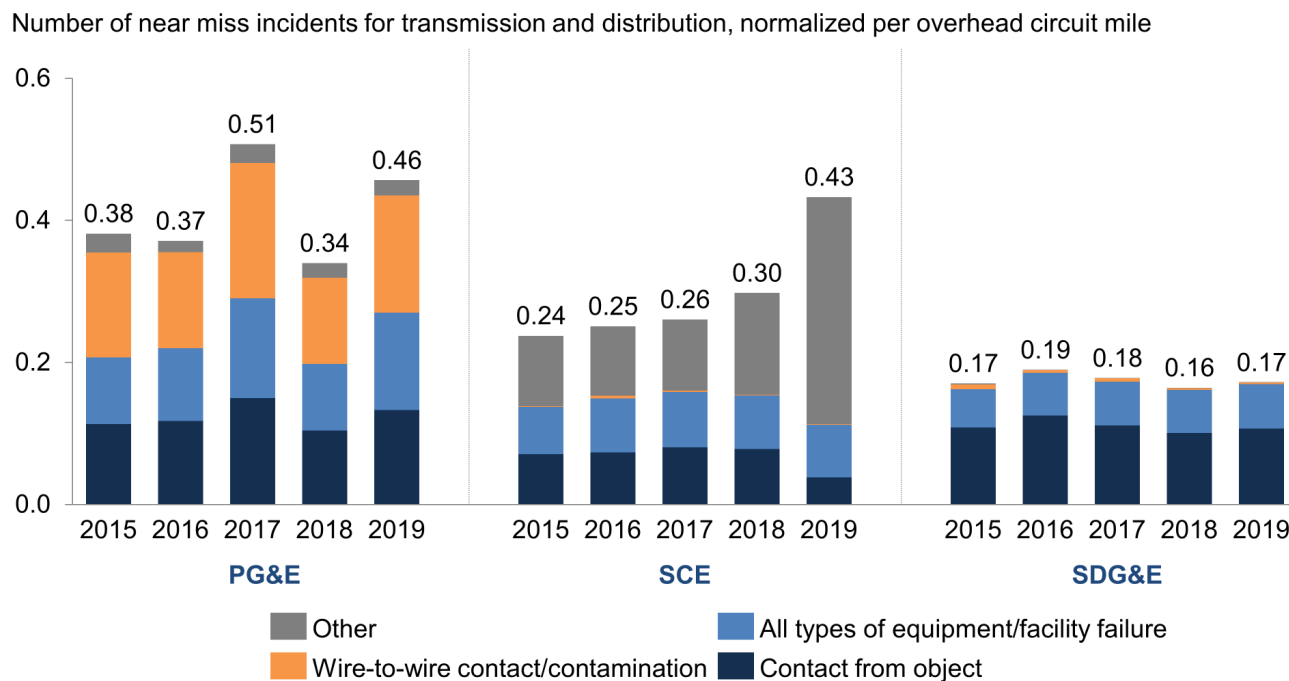


Note: Utilities reported their inspection findings as normalized by total circuit miles in Table 1 of their WMPs. In Table 1, Liberty reported inspection findings in miles between findings rather than in findings per circuit mile as the 2020 WMP Guidelines directed. To represent inspection findings in 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 inspection findings normalized per overhead circuit mile rather than per total circuit 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

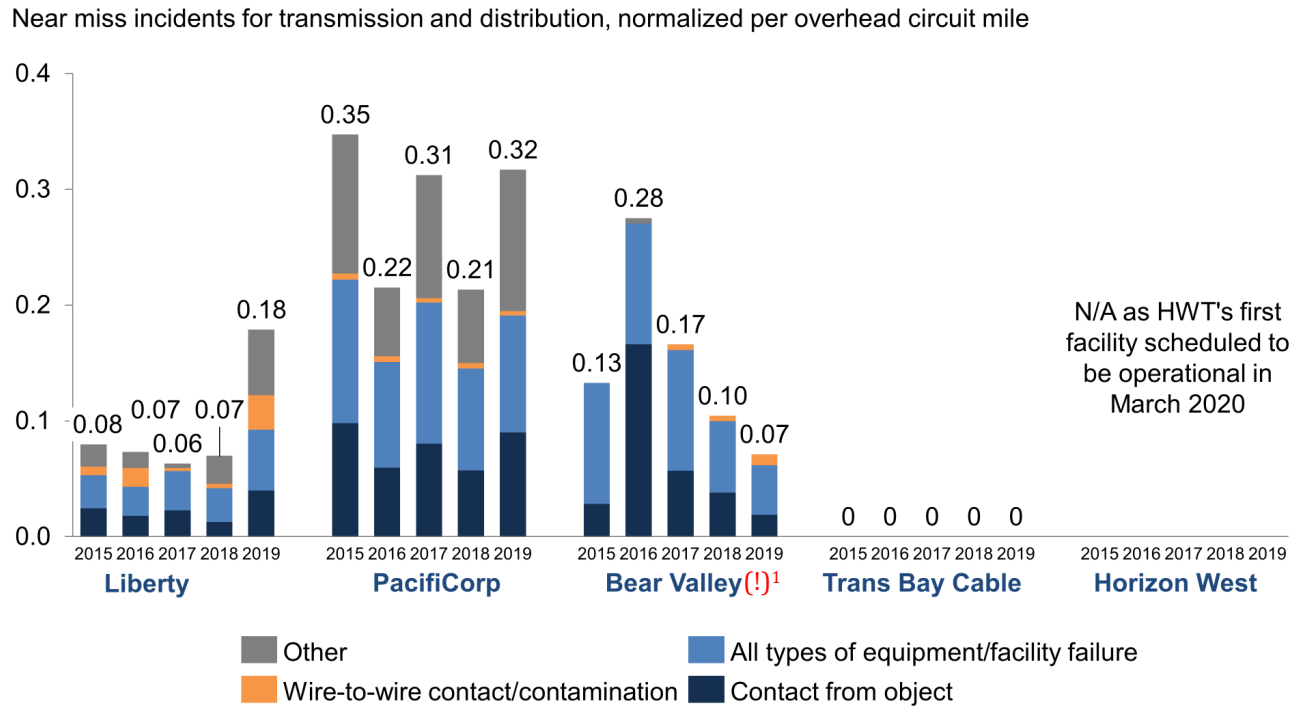
Figure 2.2a: Near miss incidents normalized by overhead circuit mileage (Large utilities)



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)



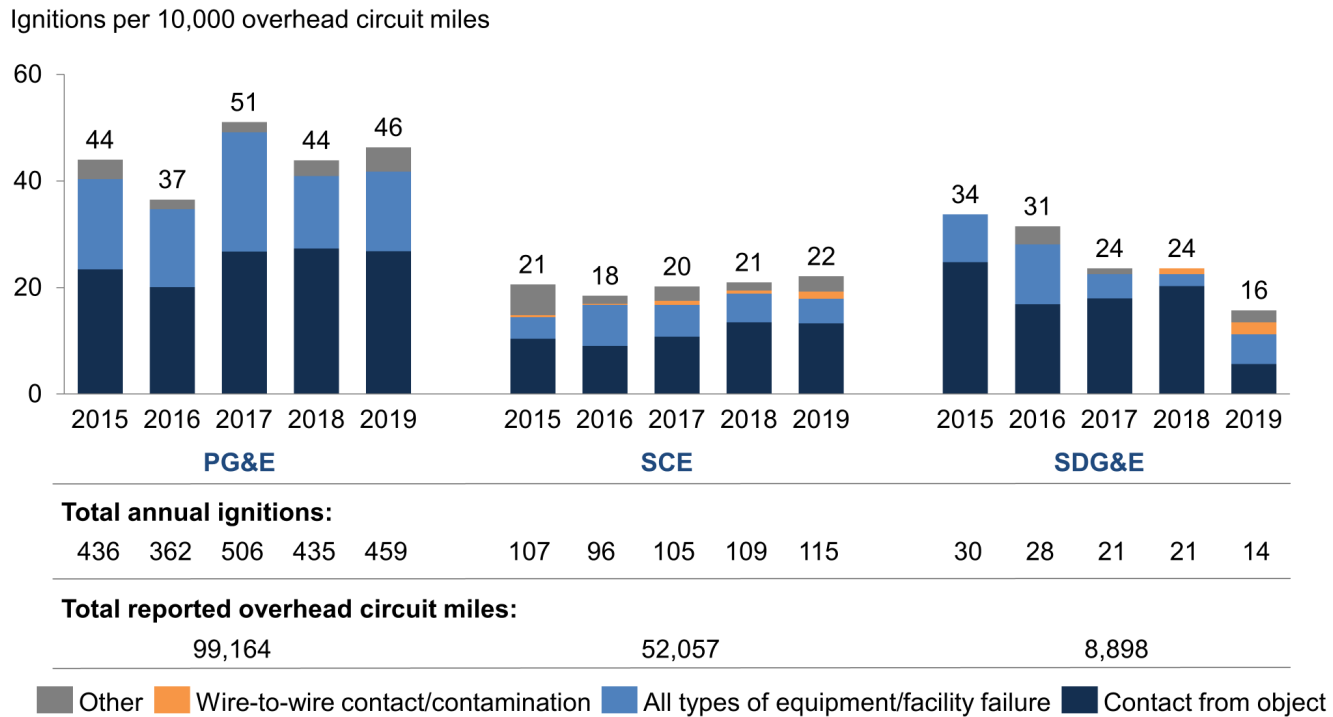
Note: The measurement of each 'near miss' is not yet perfectly standardized across utilities. The WSD will work toward a more standardized approach for tracking and classifying near miss data for 2021 WMPs. A near miss was defined in the 2020 WMP Guidelines as "An event with significant probability of 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).

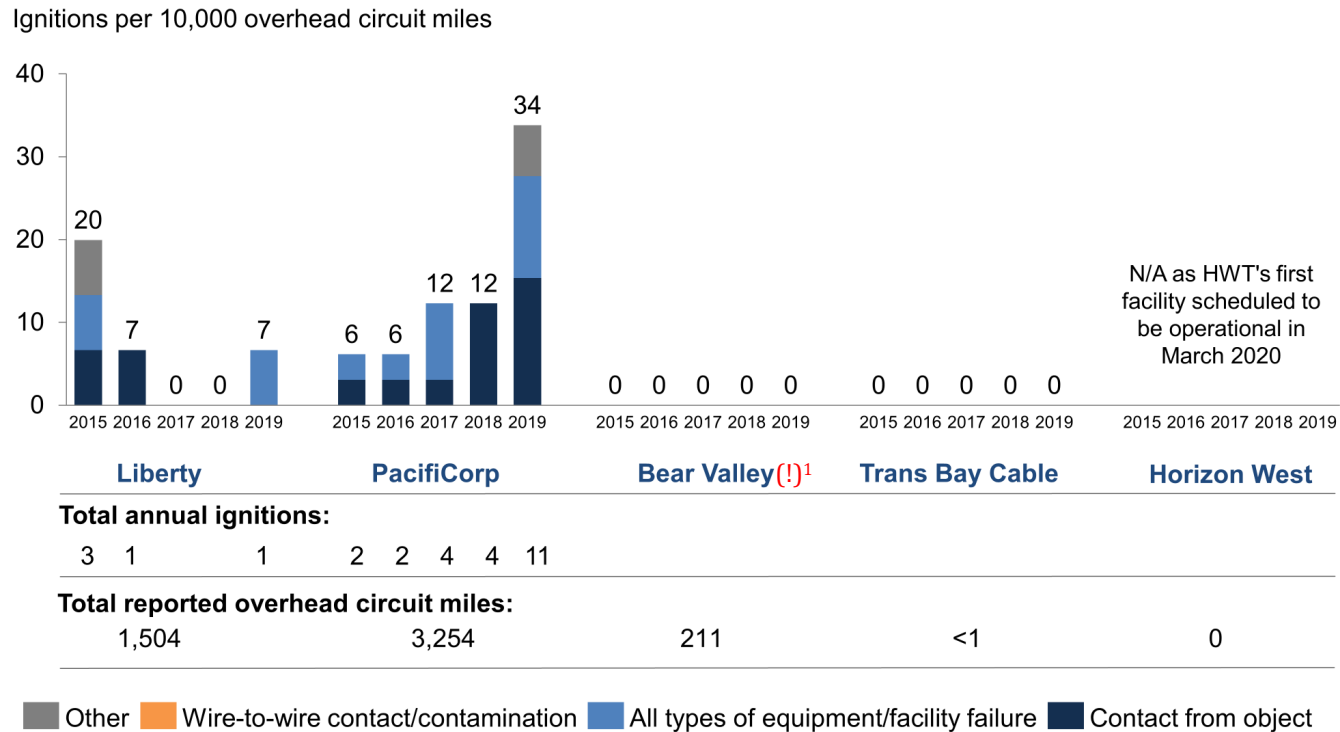
Source: Tables 11a and 11b from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs; BVES numbers adjusted to address inconsistencies in subtotal calculations provided.

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)

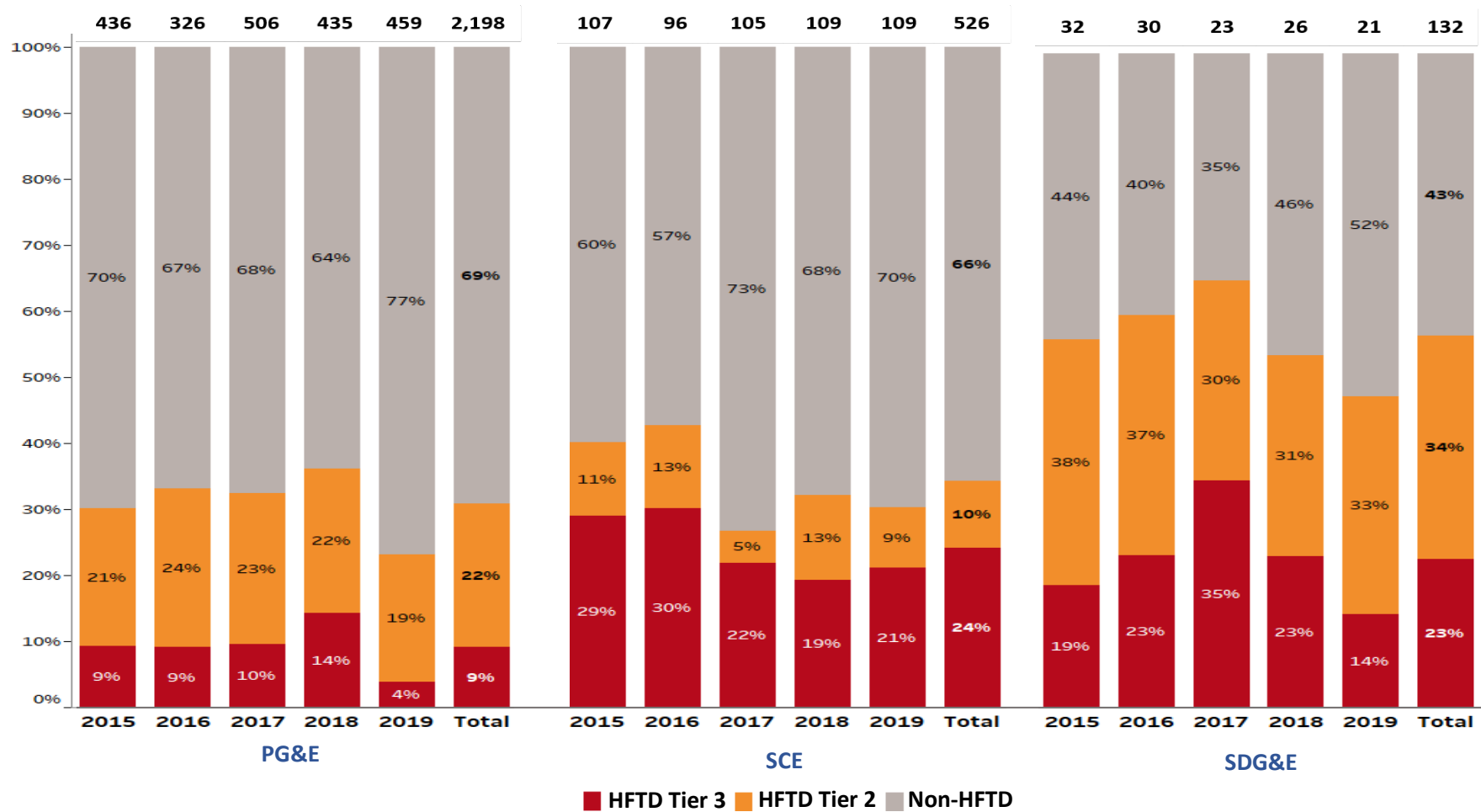


Note: Total number of ignitions only shown for utilities and years where ignitions were greater than zero.

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.

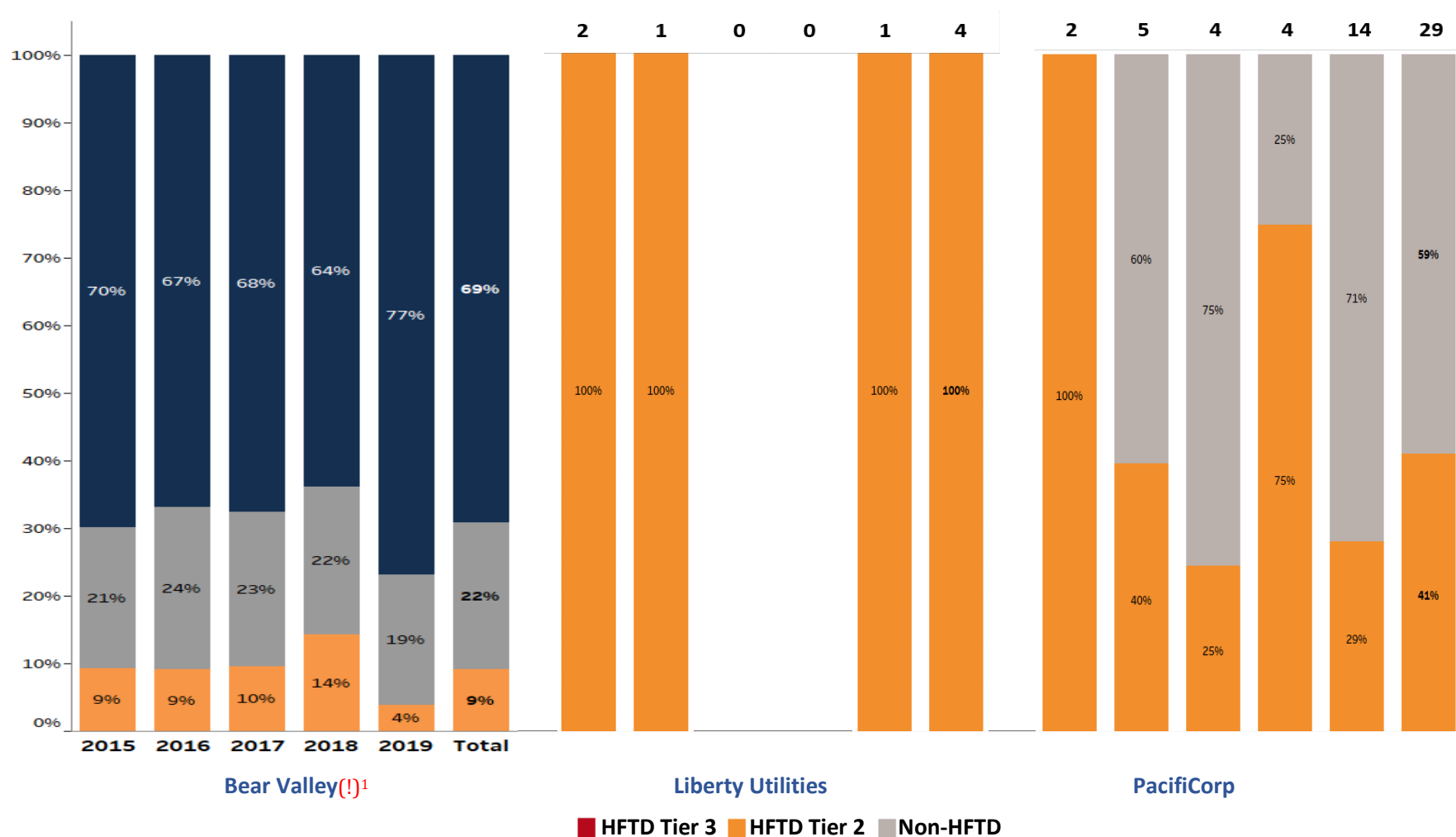
Figure 2.4a: Total ignitions by HFTD location (Large utilities)



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)



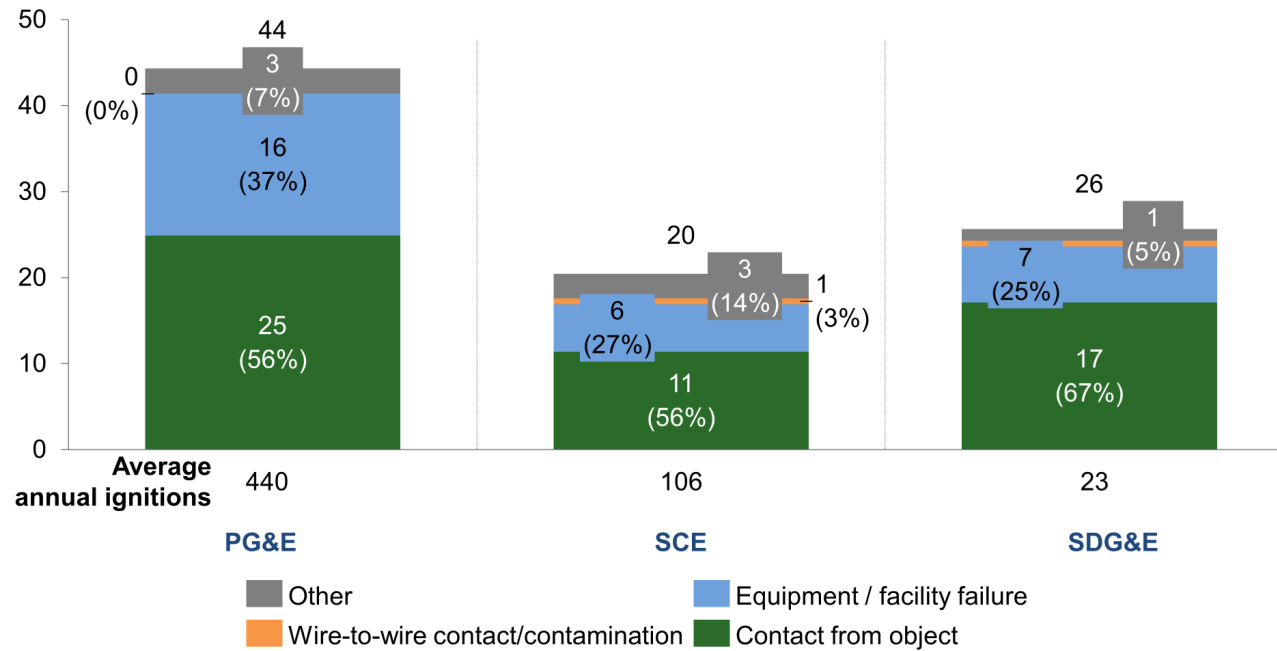
Note: Ignitions in Zone 1 HFTD areas make up less than 1% of total ignitions.

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)

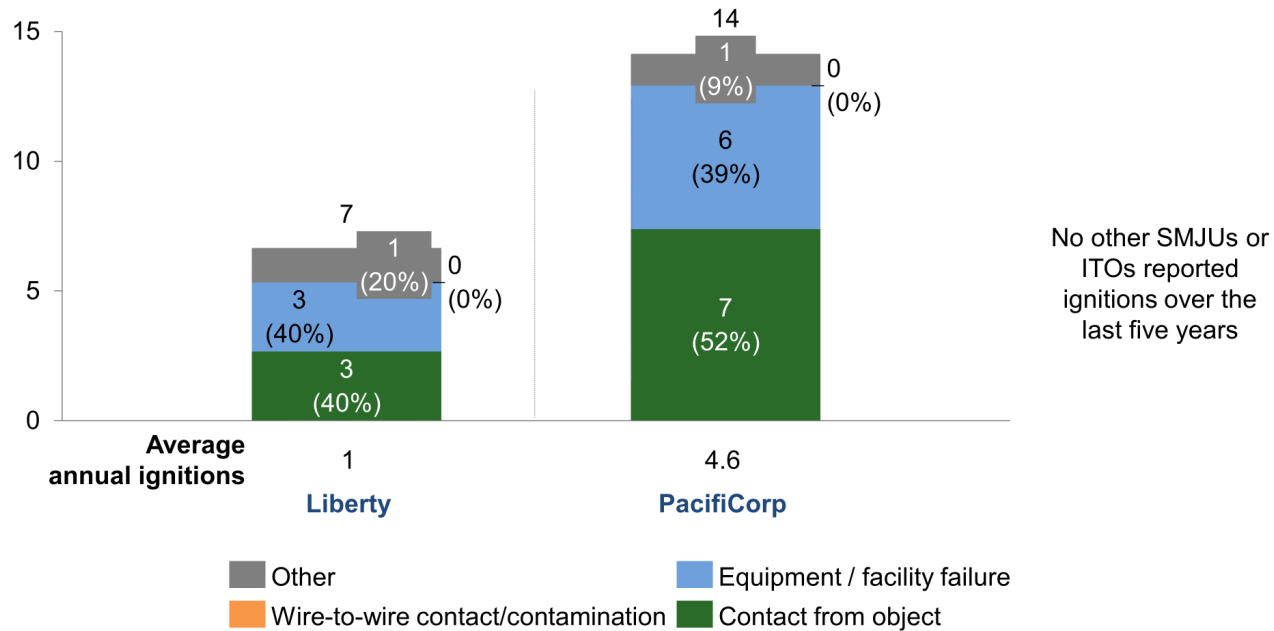
Average annual ignitions, transmission and distribution, 2015-2019, per 10,000 overhead circuit miles



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)

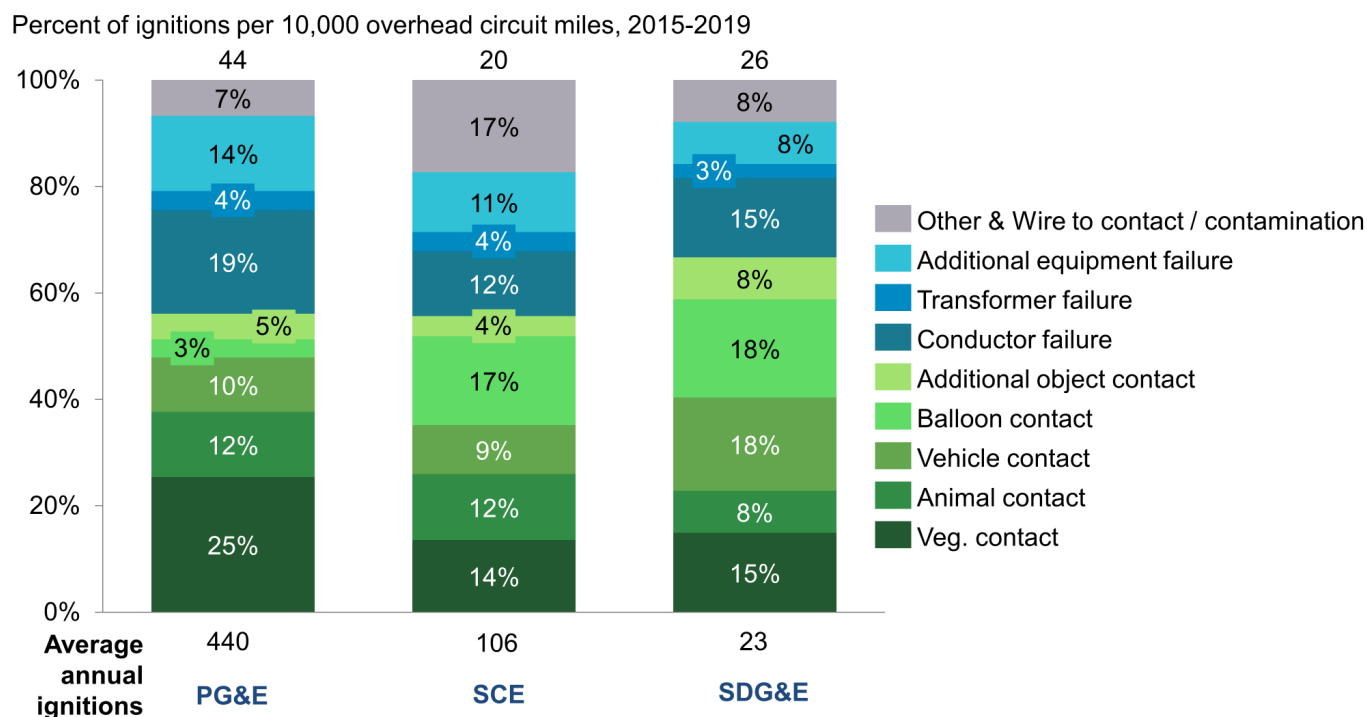
Average annual number of ignitions, transmission and distribution, 2015-2019, per 10,000 overhead circuit miles



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.

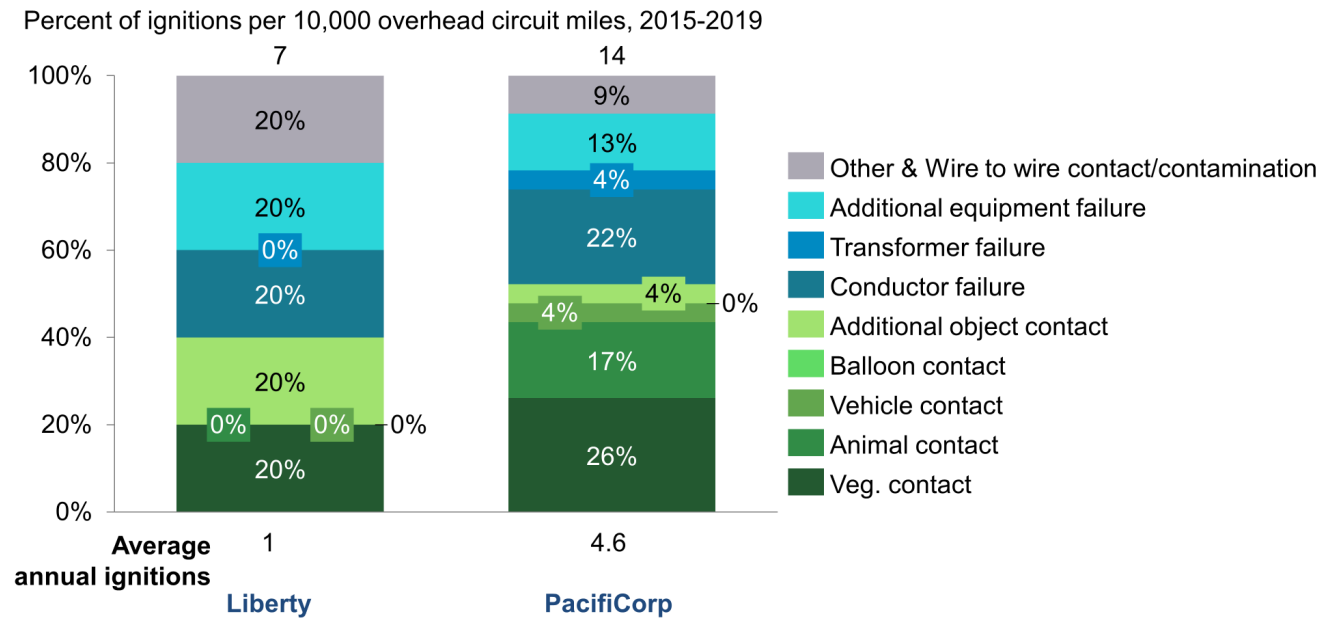
Figure 2.6a: Detail: Share of ignitions due to each ignition probability driver (Large utilities)



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)

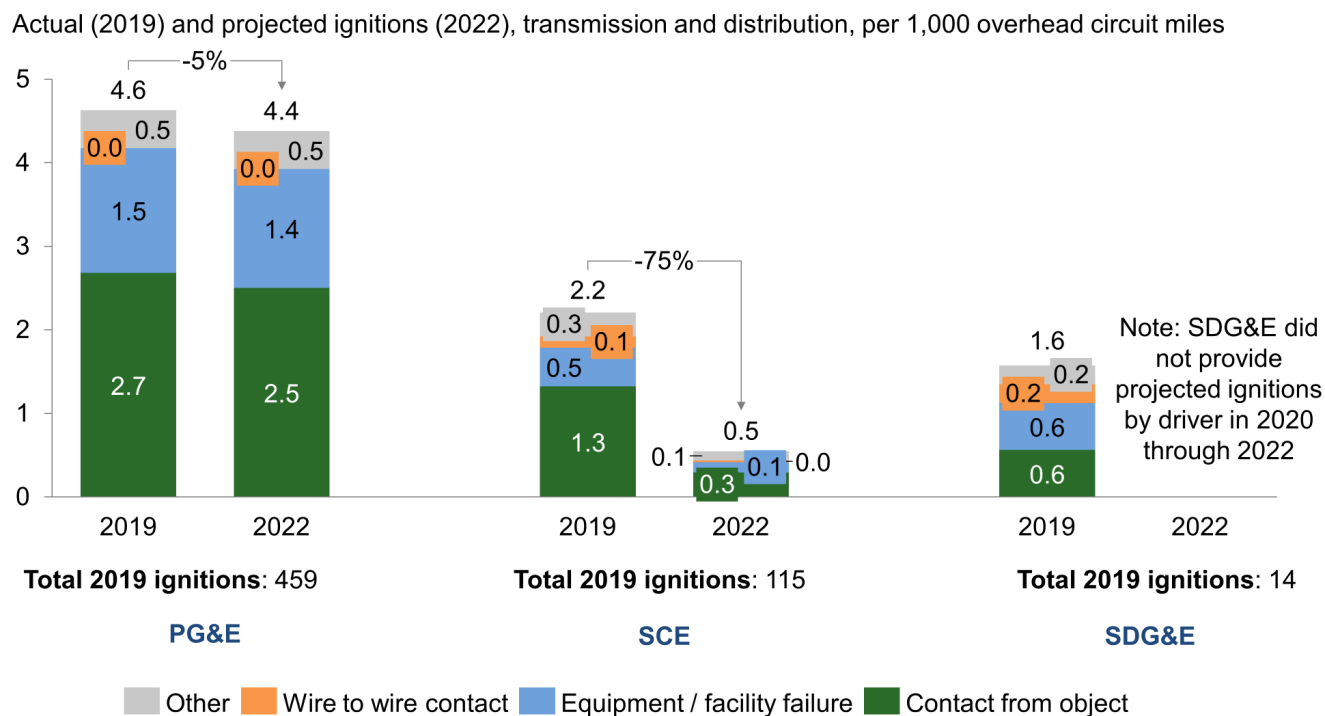


No other small utilities reported ignitions over the last five years

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



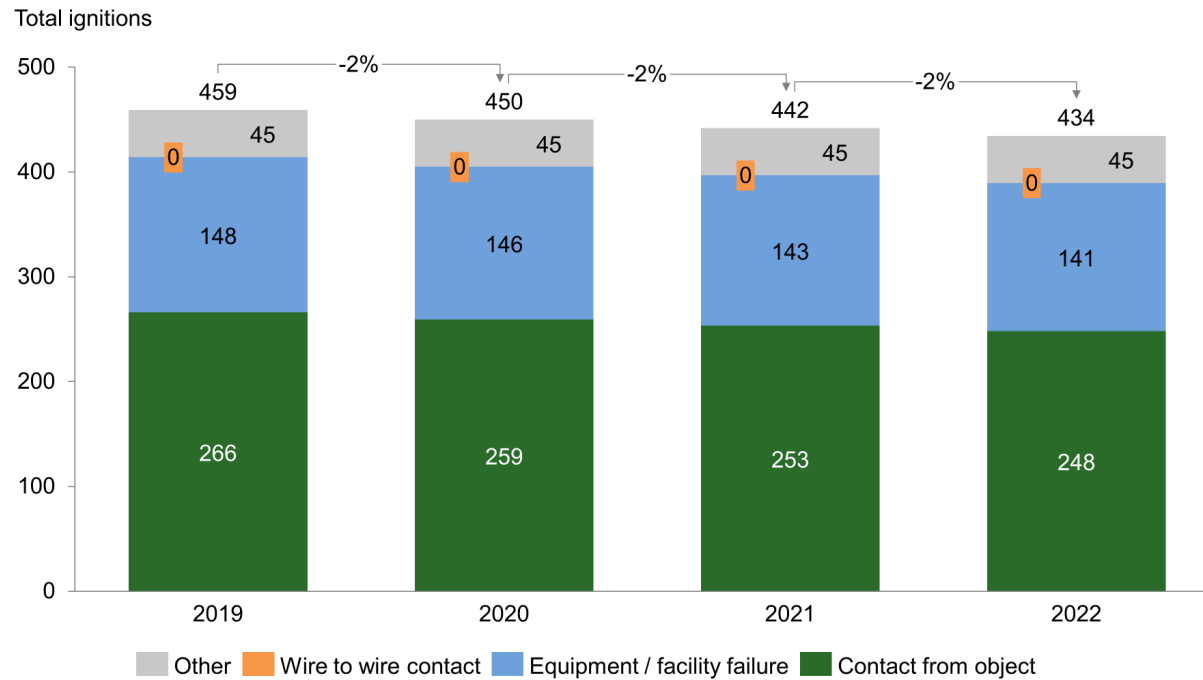
Note: Projections assume WMP implementation according to plan and weather patterns consistent with 5 year historical average. See the 2020 WMP Guidelines for further detail.

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

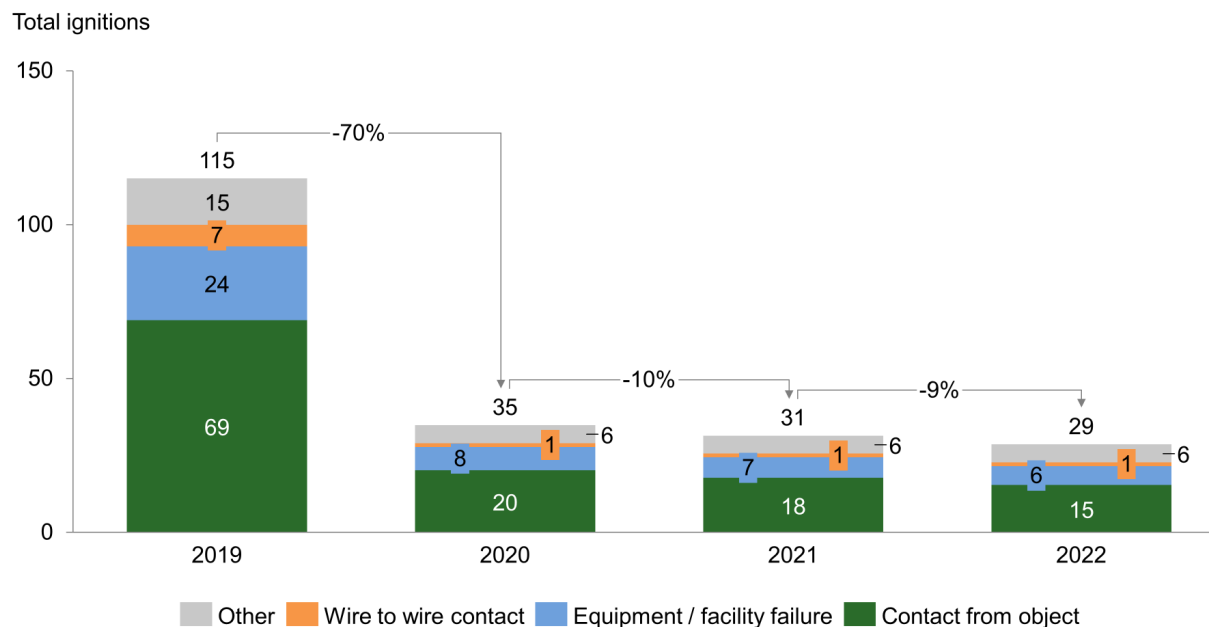


Note: Projections assume WMP implementation according to plan and weather patterns consistent with 5 year historical average. See the 2020 WMP Guidelines for more information on assumptions made.

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

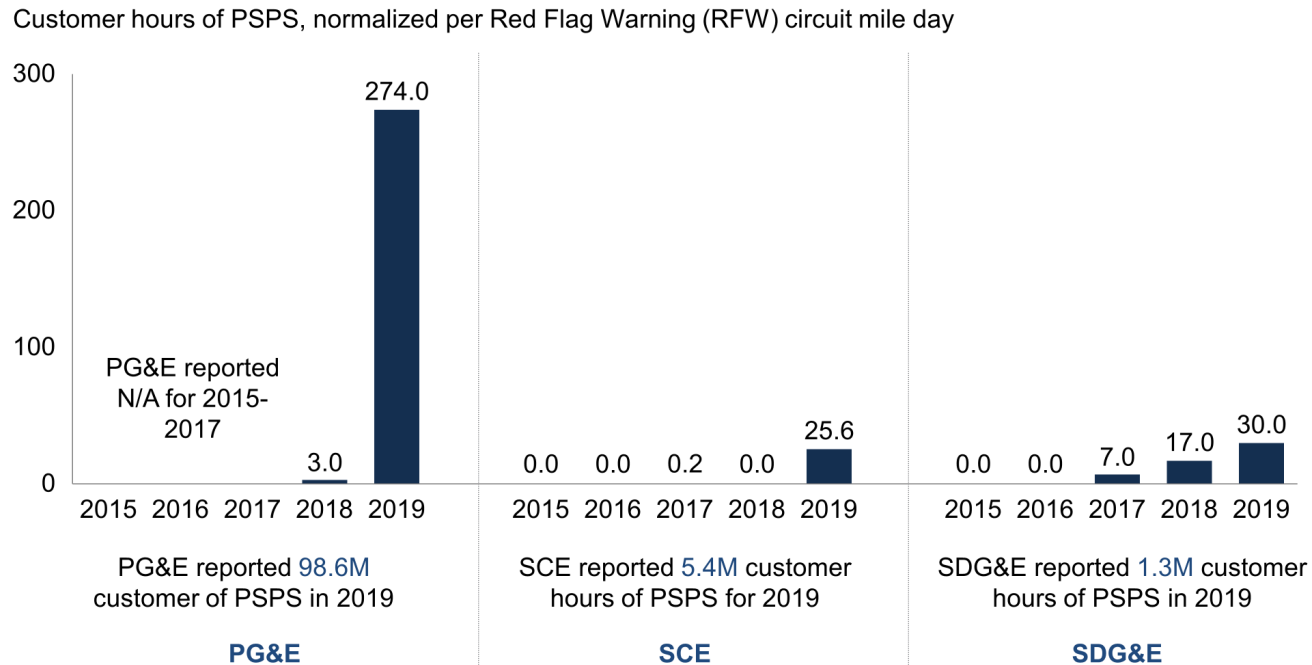
Figure shows reported 2019 ignitions and projected future ignitions by driver category, for transmission and distribution



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)

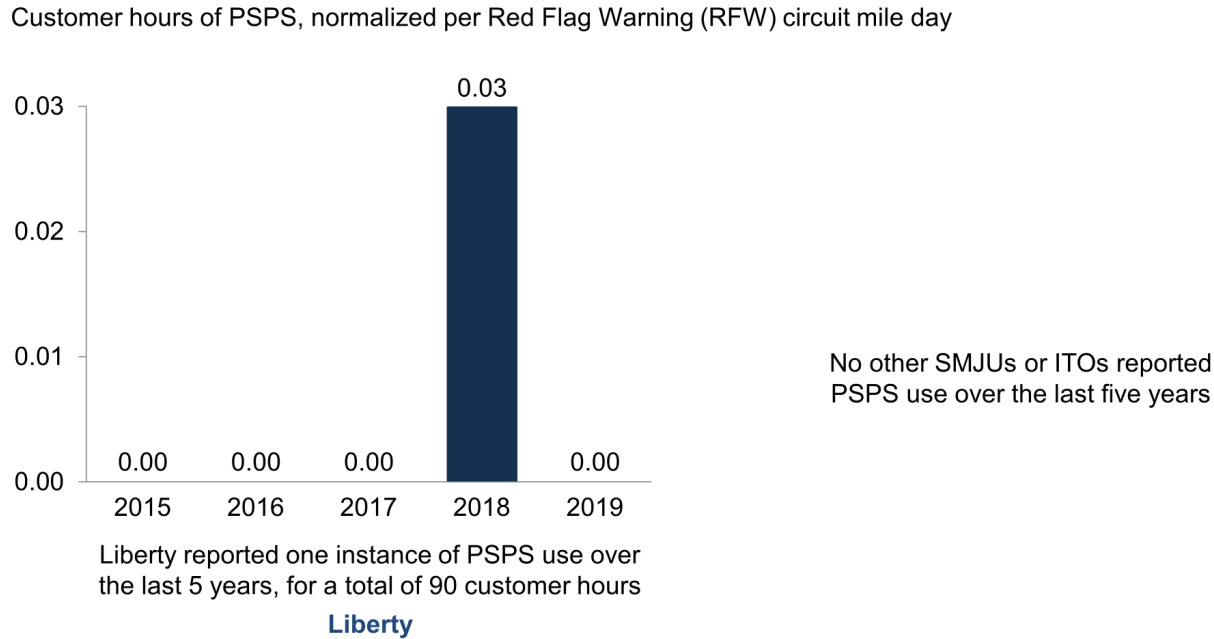


Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric; more detail is necessary to address potential inconsistencies in how each utility calculates this figure. A “Red Flag Warning (RFW) Circuit Mile Day” is intended to capture 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)

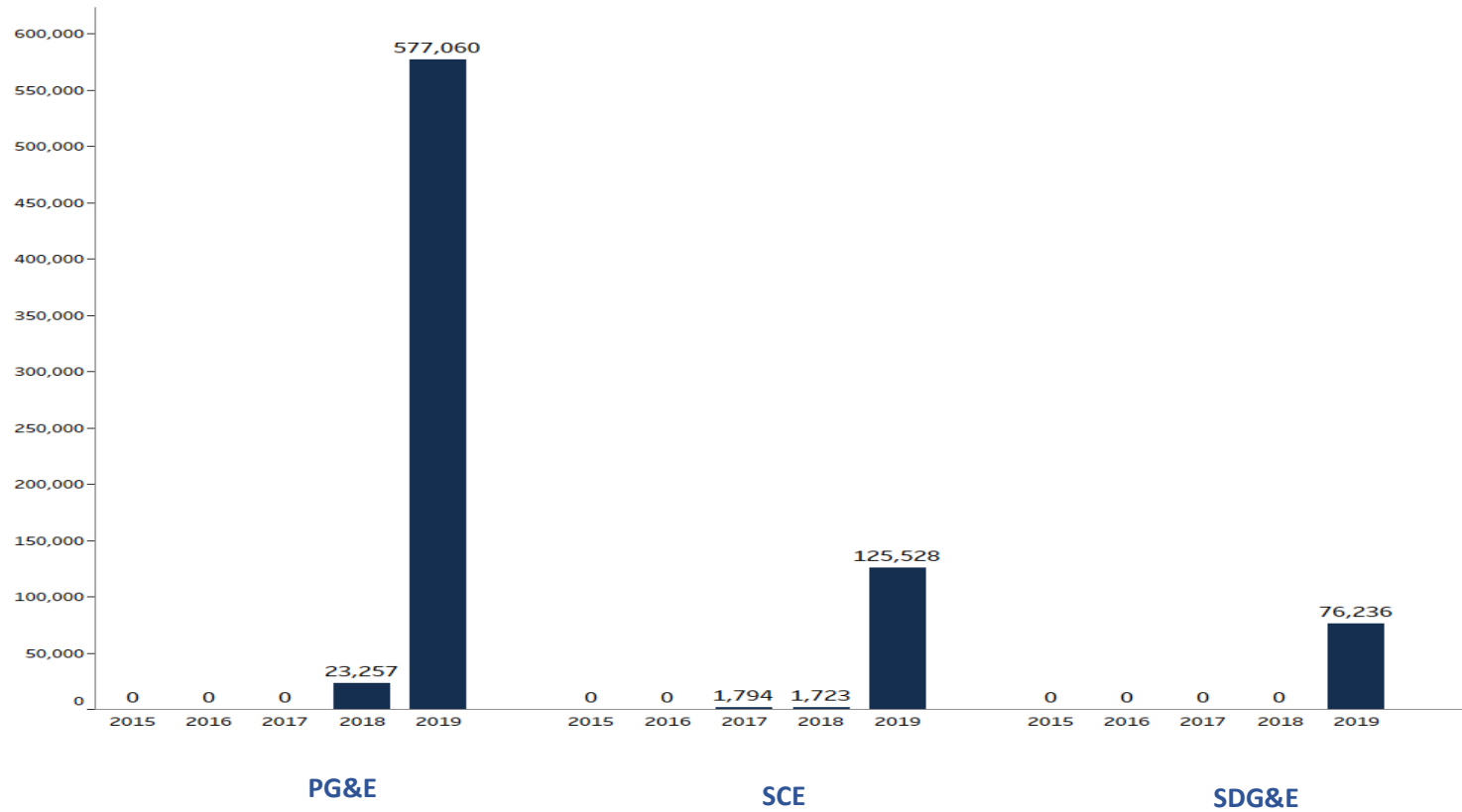


Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric; more detail is necessary to address potential inconsistencies in how each utility calculates this figure. A “Red Flag Warning (RFW) Circuit Mile Day” is intended to capture 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

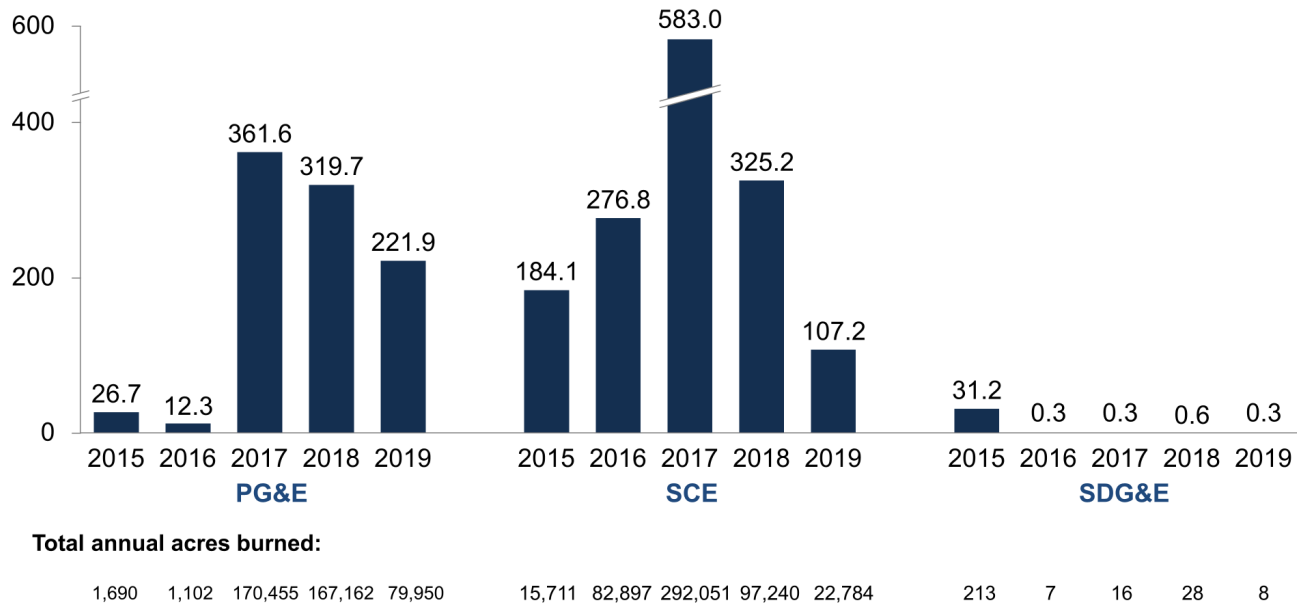


Note: Count is based on number of critical infrastructure locations impacted per hour multiplied by hours offline per year

Source: Table 2 of utility WMPs

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

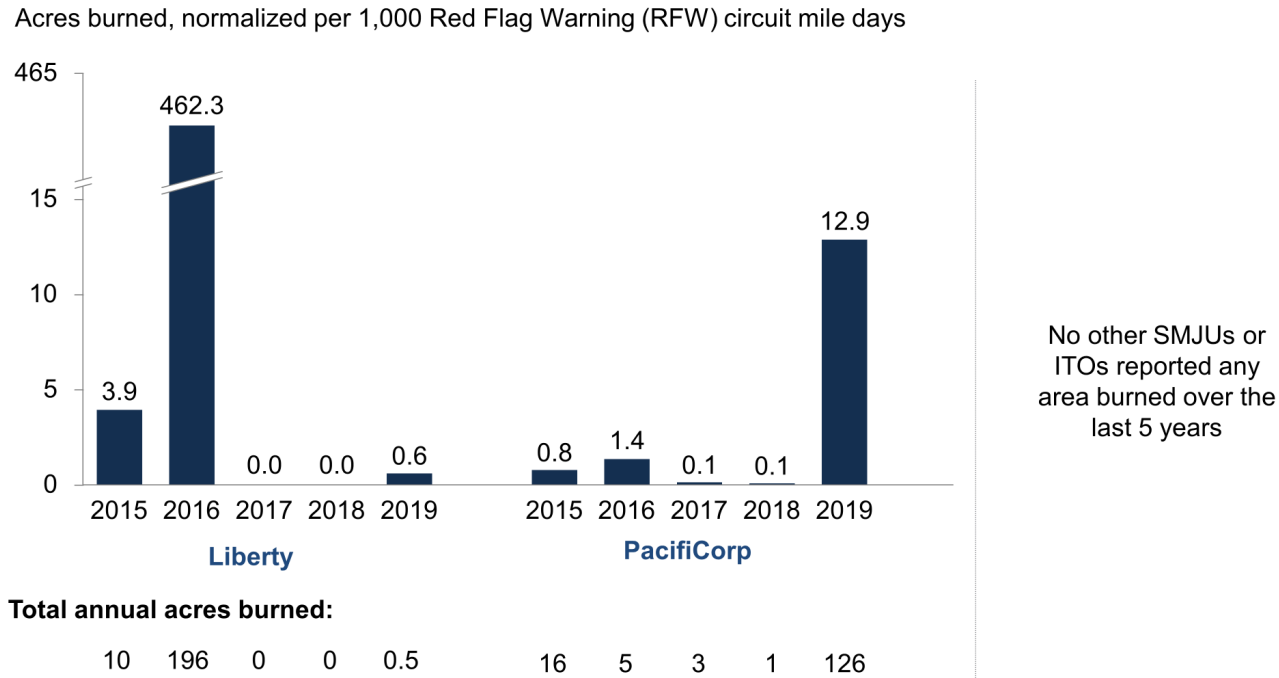
Acres burned, per 1,000 Red Flag Warning (RFW) circuit mile days



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.

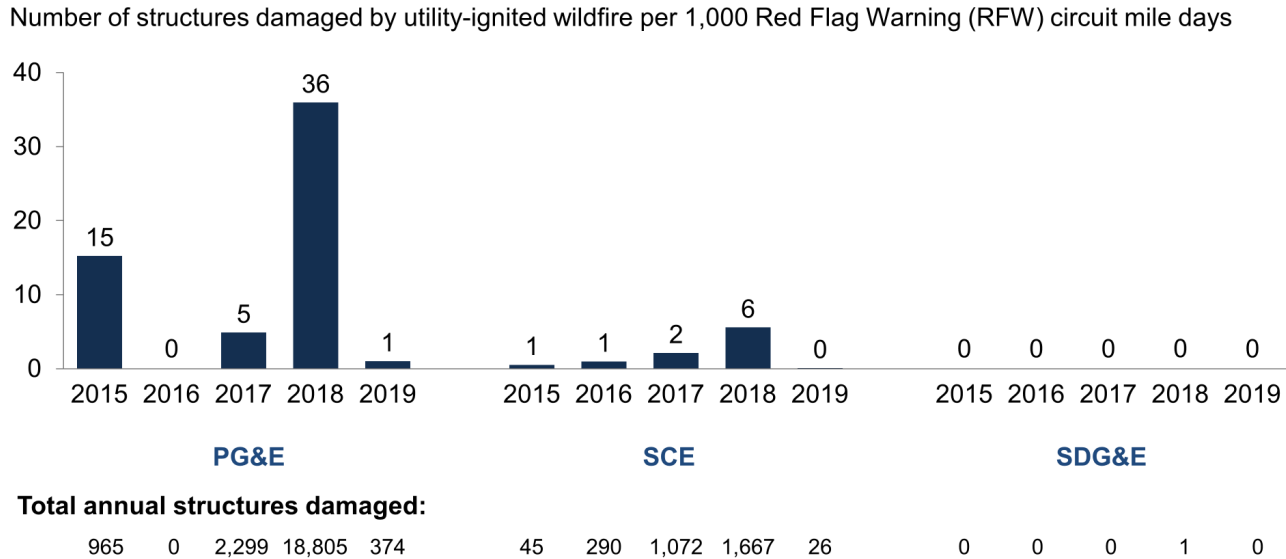
Figure 2.9b: Normalized area burned by utility ignited wildfire (Small utilities)



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



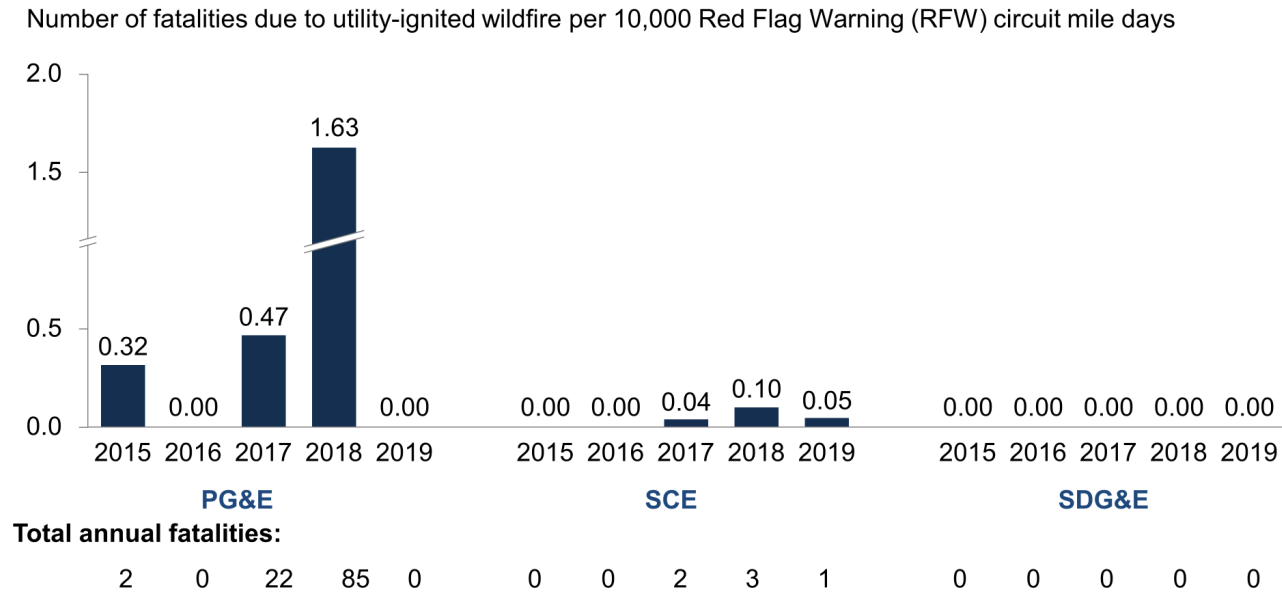
No SMJUs or ITOs reported number of structures damaged over the past 5 years

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 destroyed, 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

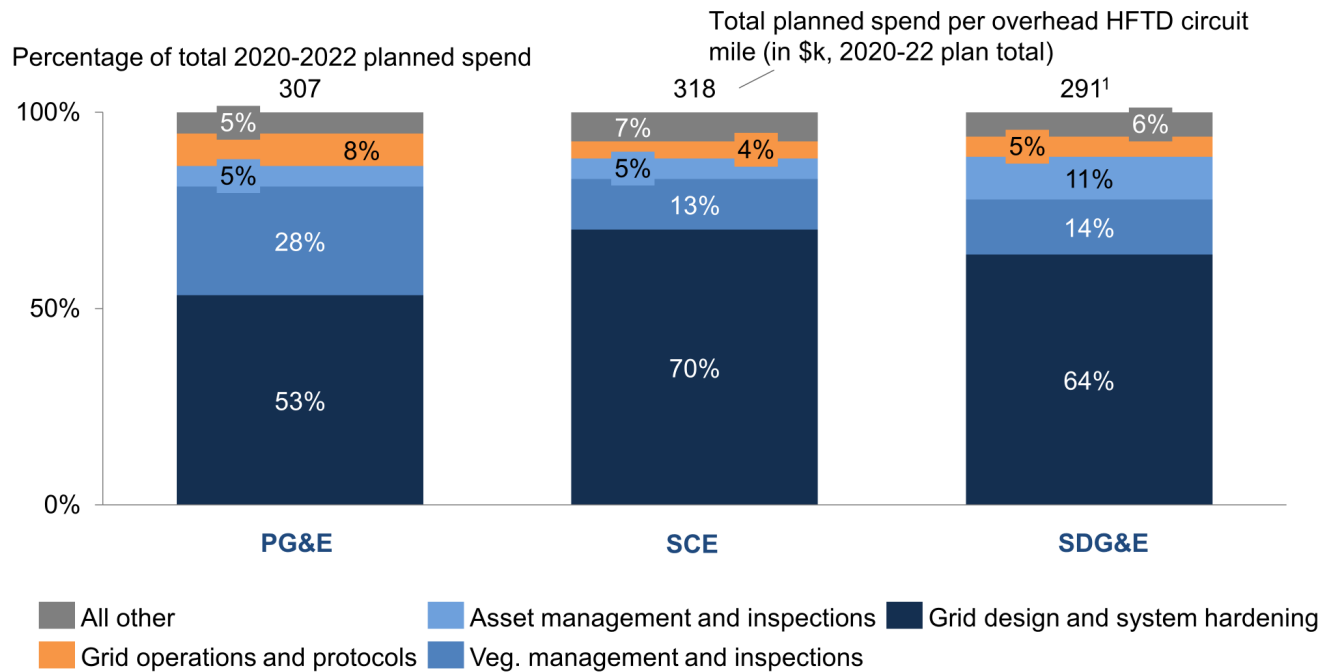
1. Totals for Liberty, PacifiCorp, and Bear Valley include calculation errors on the part of utilities in which the reported sum of the spend for 2020, 2021, and 2022 is not equal to the total reported 2020-2022 planned spend. This error has not been corrected by the WSD in this table.

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

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

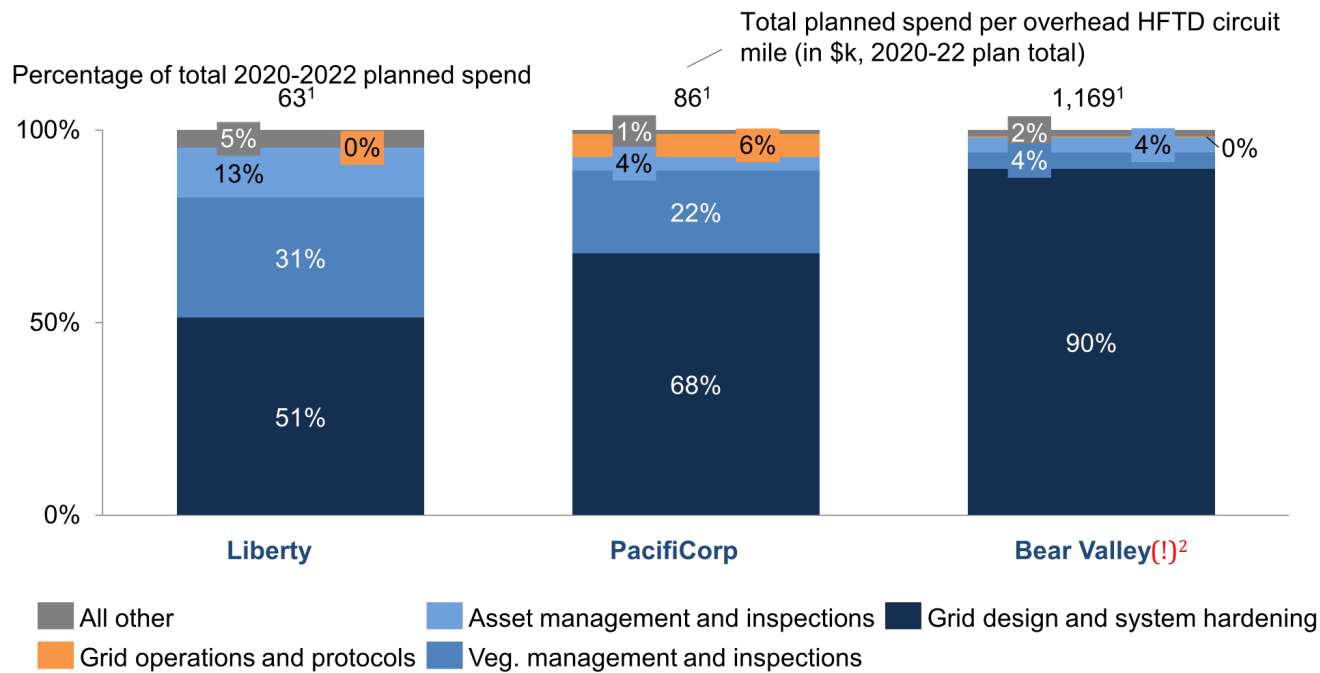
Figure 3.2a: Overview of total plan spend across utilities (Large utilities)



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

Category	PG&E		SCE		SDG&E	
	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

Category	Liberty		PacifiCorp		Bear Valley(!) ²	
	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

			Planned spend, \$M					Initiative spend as percent of total planned spend	
	Initiative	Category	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

		Planned spend, \$M						Initiative spend as percent of total planned spend
Initiative	Category	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					2020-2022 plan total	Initiative spend as percent of total plan spend
			2019 plan	2019 actual	2020 plan	2021 plan	2022 plan		
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

			Planned spend, \$M					Initiative spend as percent of total plan spend	
	Initiative	Category	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

		Planned spend, \$M					2020-2022 plan total	Initiative spend as percent of total plan spend
Initiative	Category	2019 plan	2019 actual	2020 plan	2021 plan	2022 plan		
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

			Planned spend, \$M					Initiative spend as percent of total plan spend	
Initiative	Category	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

Initiative	Upper range ¹ of 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	
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

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

Term	Definition
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 C)