APPENDIX A

Deficiencies and Conditions

LIB-1	Liberty did not describe methods for tracking effectiveness of its covered conductor initiative.
Class	B
Deficiency	Although Liberty asserts intention to extensively deploy covered conductor throughout its entire service territory, Liberty has not developed a method for tracking the effectiveness of its planned covered conductor installations or studied the structural impacts that such a broad deployment would create on the existing overhead infrastructure across its service territory.
Condition	In its first quarterly report, Liberty shall: i. Describe a methodology for tracking and measuring the effectiveness of its covered conductor installations at reducing the frequency and probability of: 1. outages for top 10 outage causes based on best available historical data, and 2. ignitions for all CPUC reportable ignitions, ii. Describe the magnitude and scope of the structural impacts of broad covered conductor deployment across its existing overhead facilities, the associated asset replacement consequences by asset type, and the estimated cost of those associated replacements.

LIB-2	Liberty reports inspection frequencies that raise concerns about effectiveness.
Class	B
Deficiency	Liberty is only planning for annual inspections in Tier 3, and a three-year cycle for other areas. This has proven to be inadequate to address grow-ins and fall-ins and has led to numerous instances of PRC violations being identified. Similarly, Liberty's third-party contractor reviews the inspection process every three years. This appears to be too long of a delay to identify deficiencies in the program which may impact ignition potential.
Condition	In its first quarterly report, Liberty shall: i. justify its three-year cycle ii. report how it is meeting its PRC clearance requirements. iii. if its current inspection cycle is insufficient to avoid violations of clearance requirements, explain how they will resolve those deficiencies, including potential increases in frequency of inspections, reviews and audits.

LIB-3	Liberty's WMP does not report detailed information about how its grid operations will reduce wildfire risk.
Class	C
Deficiency	Liberty does not articulate how it plans to evolve grid operations to drive reduction in wildfire risk. While installation of additional automated SCADA and improvements in weather forecasting are positive, Liberty is not demonstrating enough forward progress.
Condition	In its 2021 WMP update, Liberty shall: i. identify a more ambitious growth path for maturing grid operations that may serve as preventative mitigations against wildfires to drive reduction in wildfire risk.

LIB-4	**Liberty notes the challenge of attracting and retaining employees in the high-cost Lake Tahoe community.**
Class	B
Deficiency	Liberty identifies the high cost of living in its service territory as a potential labor challenge for WMP implementation but provides no discussion regarding its plans or strategy for labor recruitment.
Condition	In its first quarterly report, Liberty shall detail: i. its recruitment and retention strategy for labor, considering the high cost of living in its service territory, and ii. how it plans to deal with this constraining factor in scaling its WMP programs and initiatives.

(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.

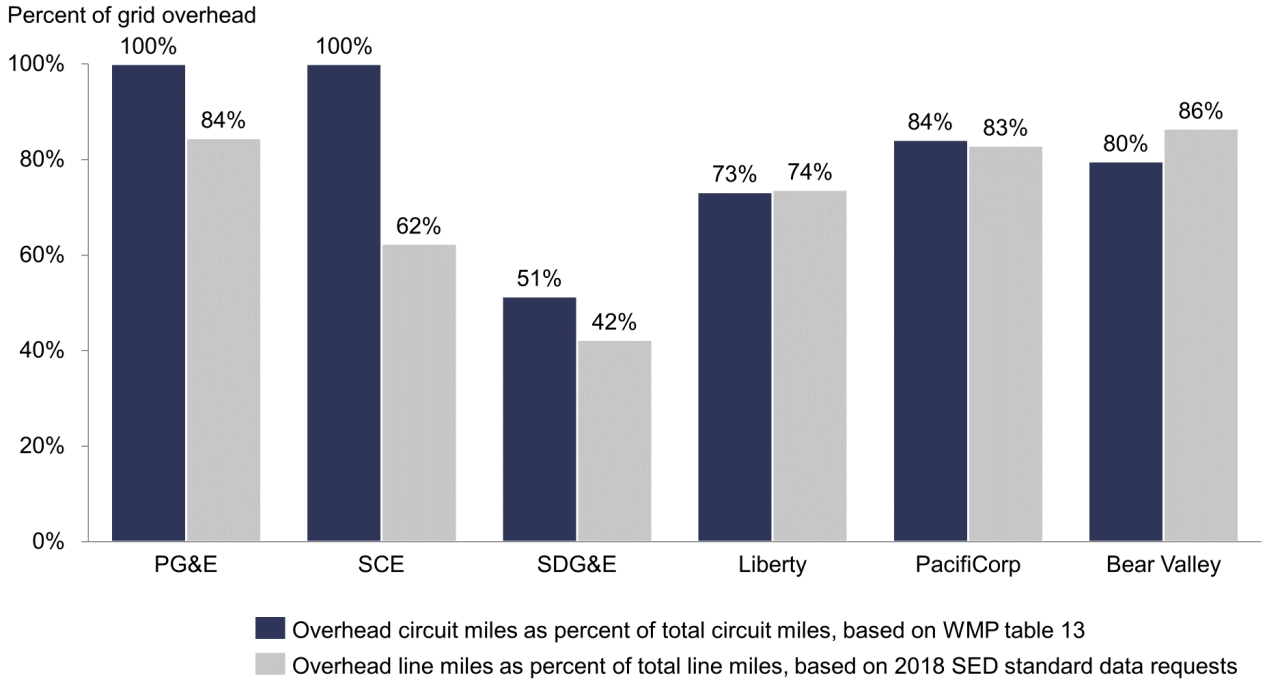
All the analysis and corresponding figures presented in this appendix rely upon data that is self-reported by the utilities. By utilizing and presenting this self-reported data in this appendix, the WSD is not independently validating that all data elements submitted by utilities are accurate. The WSD 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

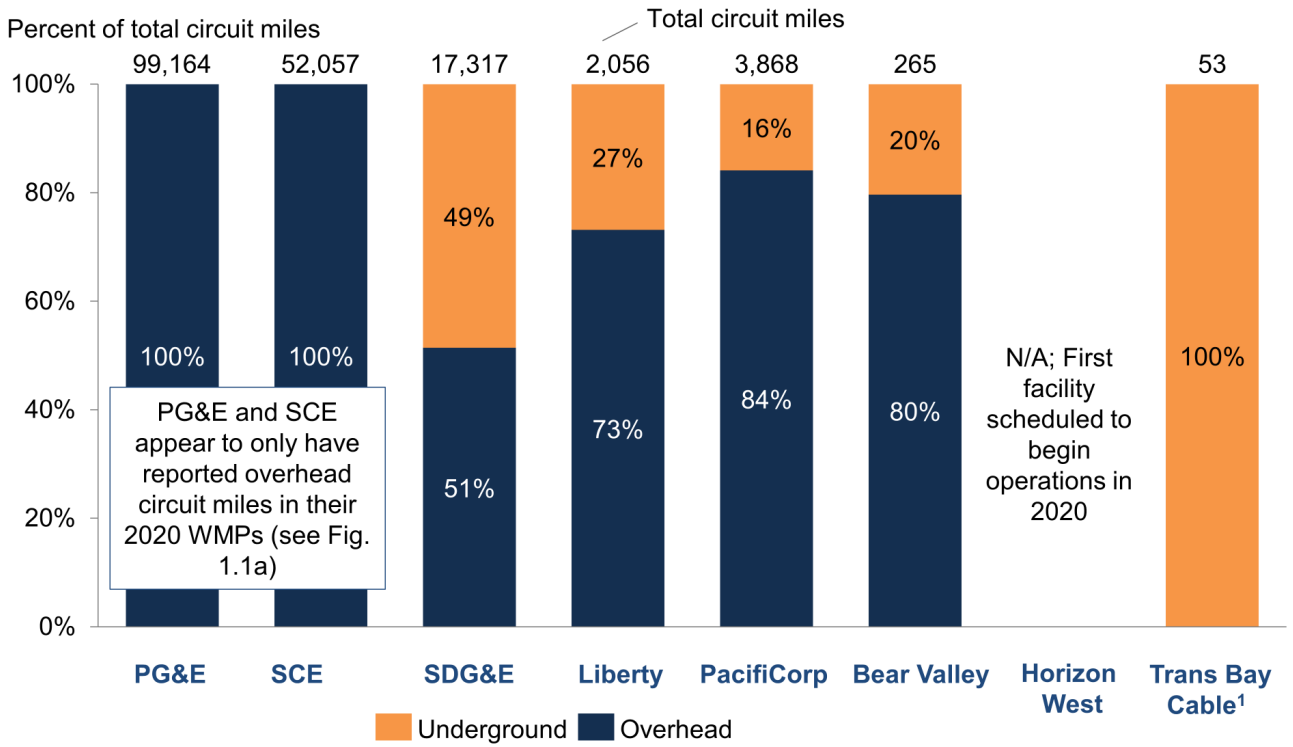
Figure 1.1a: Comparison of data sources for circuit typologies



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.

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

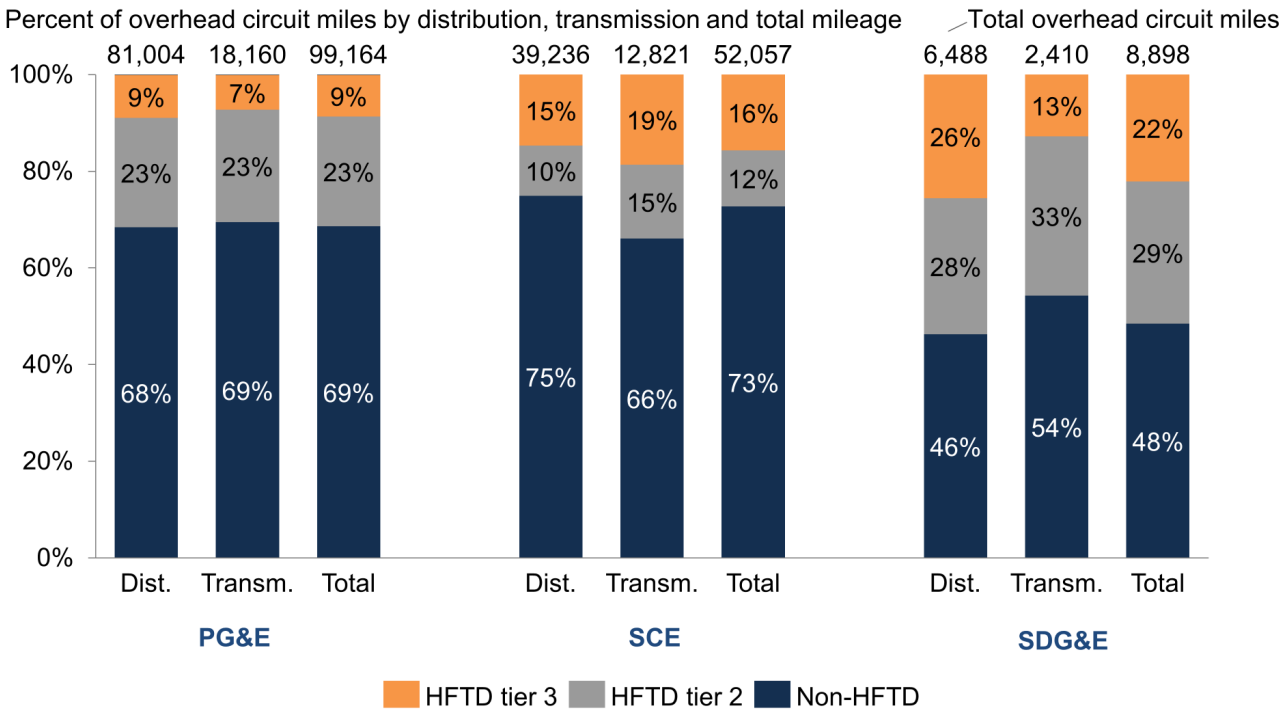


1. Trans Bay Cable did not report underground circuit miles in Table 13 of the WMP, but mentioned on page 8 of its WMP that it had 53 circuit miles of underground submarine cable, which is reflected in this chart.

Source: WMP Table 13

Figure 1.2a: Overhead circuit miles by HFTD Tier (Large Utilities)

Broken out by distribution (dist.) and transmission (transm.)

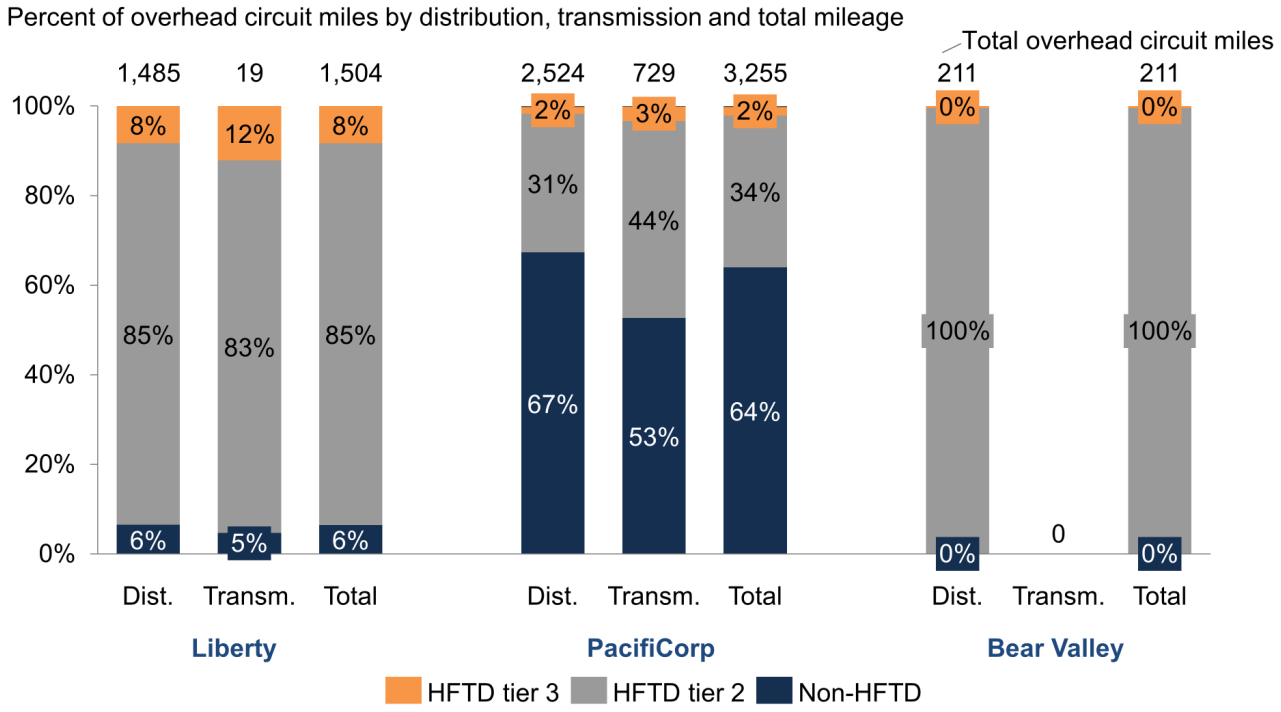


Note: Zone 1 not shown as subtotal.

Source: WMP Table 13

Figure 1.2b: Overhead circuit miles by HFTD Tier (Small Utilities)

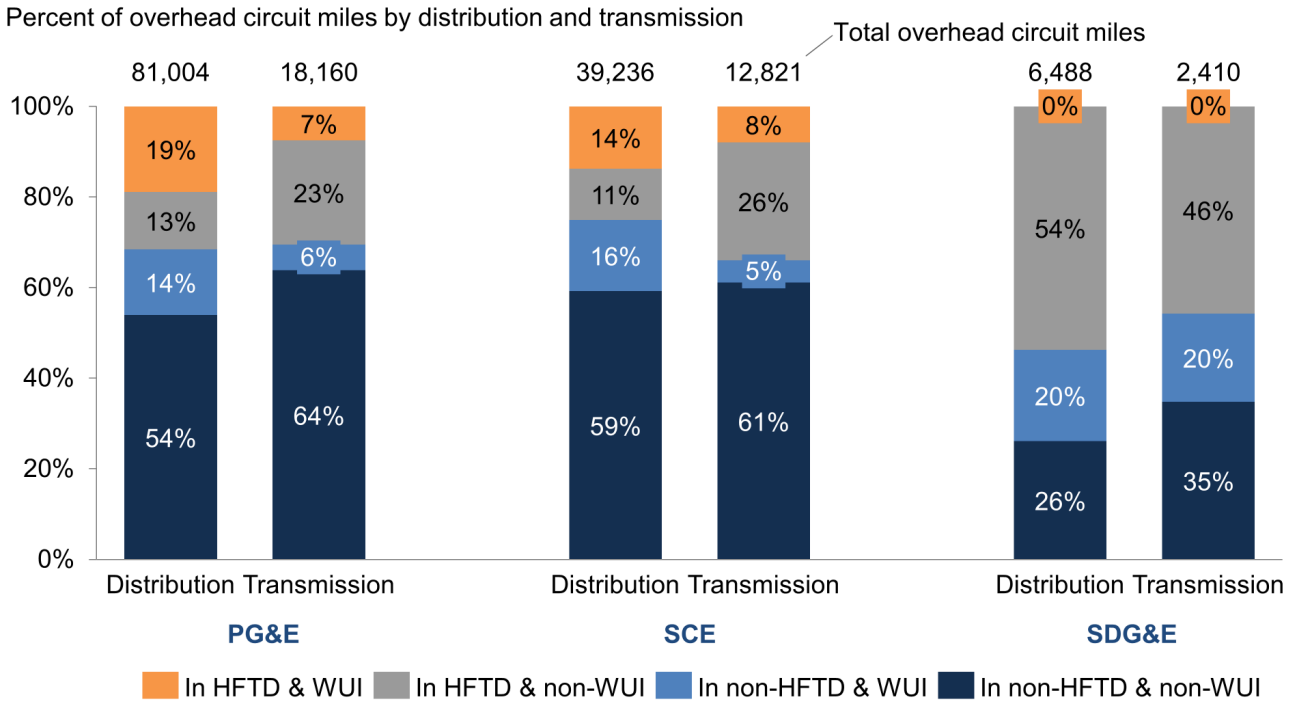
Broken out by distribution (dist.) and transmission (transm.)



Note: Zone 1 not shown as subtotal.

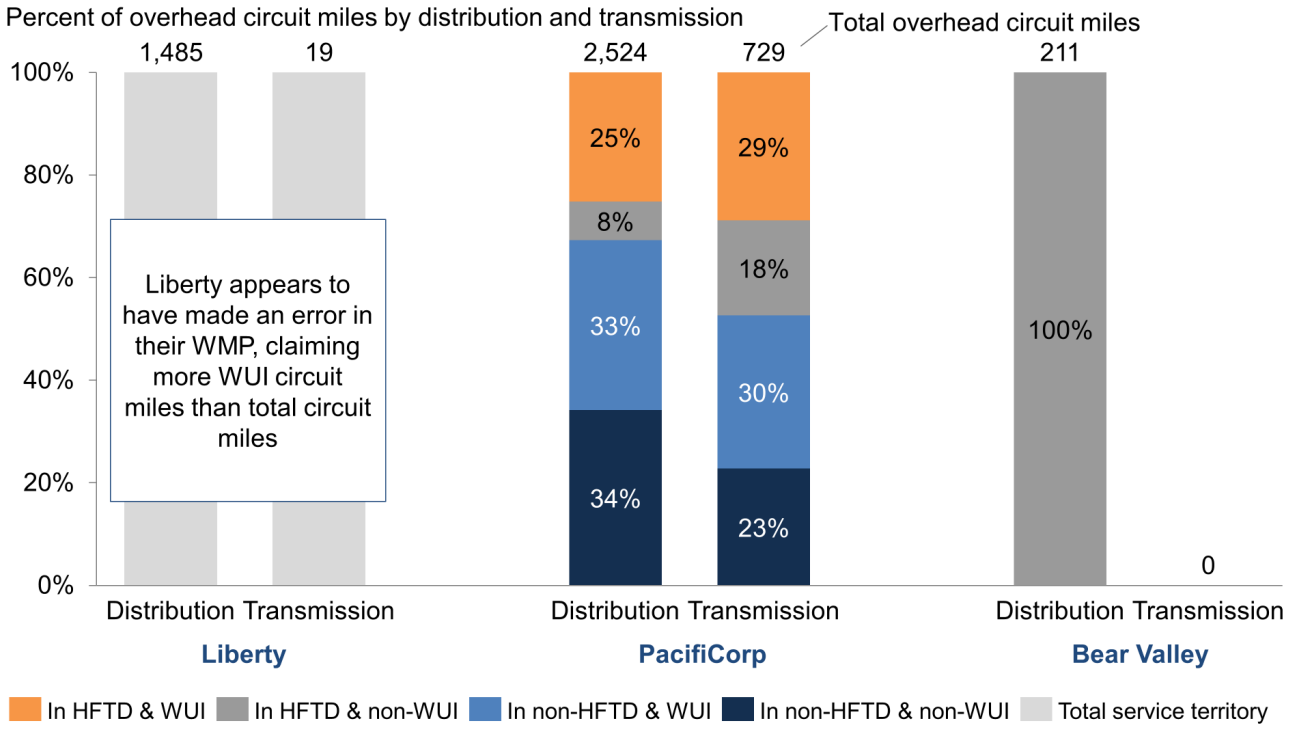
Source: WMP Table 13

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



Source: WMP Table 13

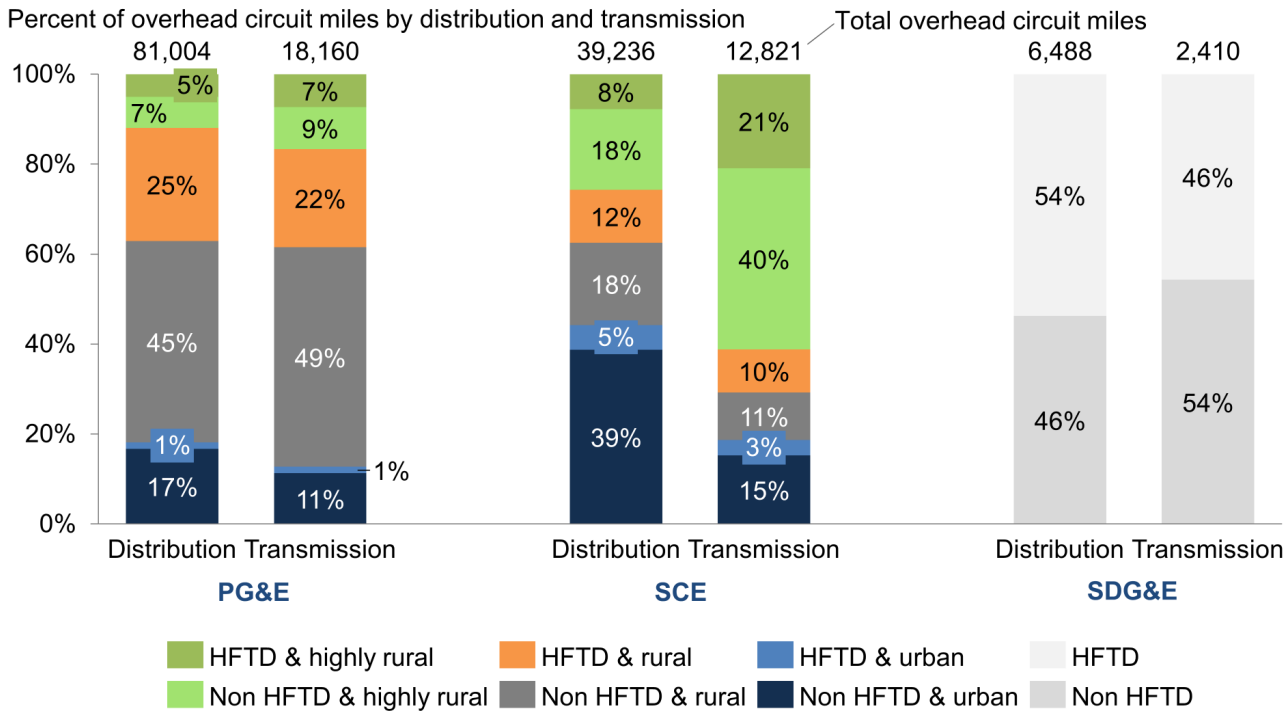
Figure 1.3b: Breakdown of overhead transmission and distribution circuit miles by HFTD and WUI location (Small utilities)



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.

Source: WMP Table 13

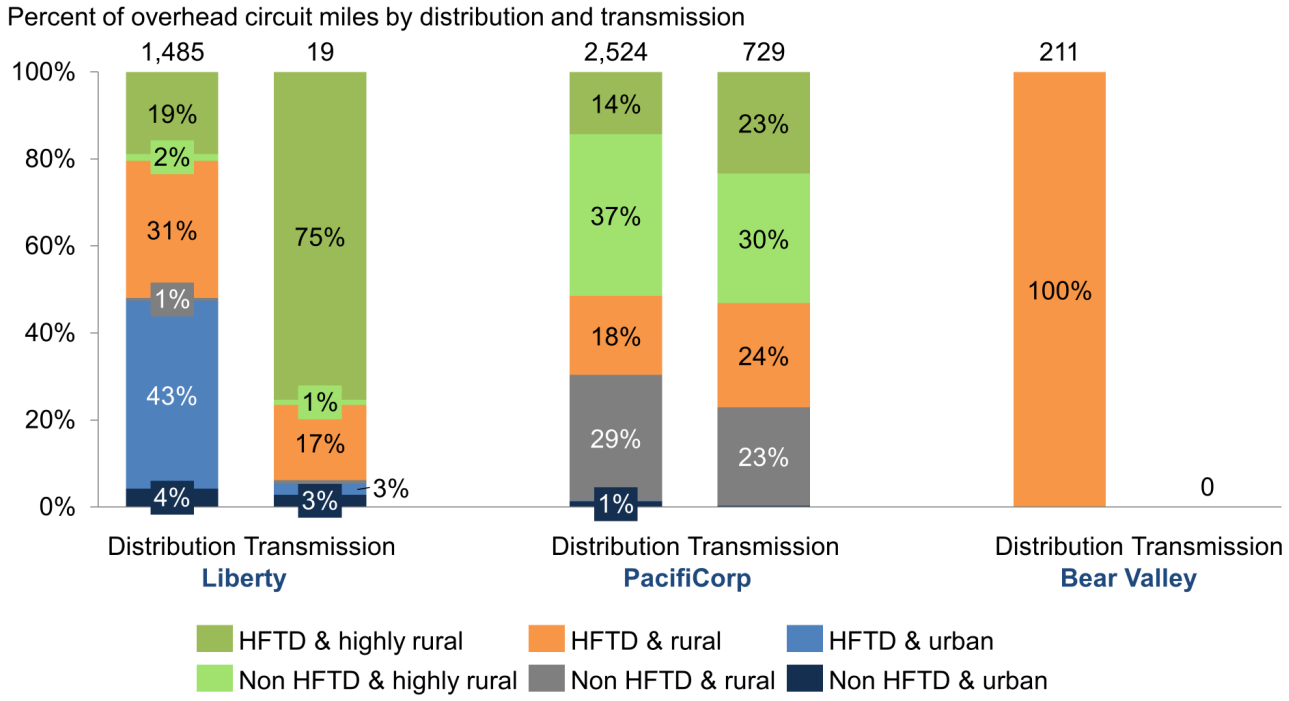
Figure 1.4a: Breakdown of overhead transmission and distribution circuit miles by HFTD and population density (Large utilities)



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

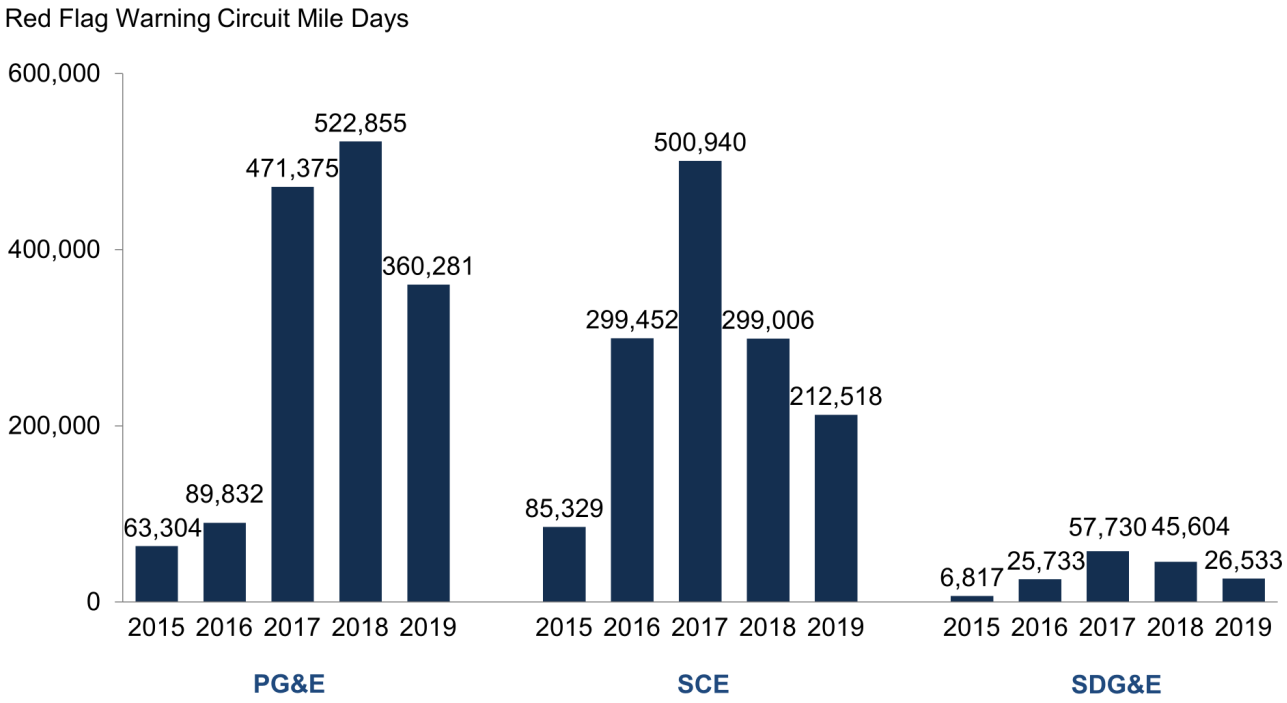
Source: WMP Table 13

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



Source: WMP Table 13

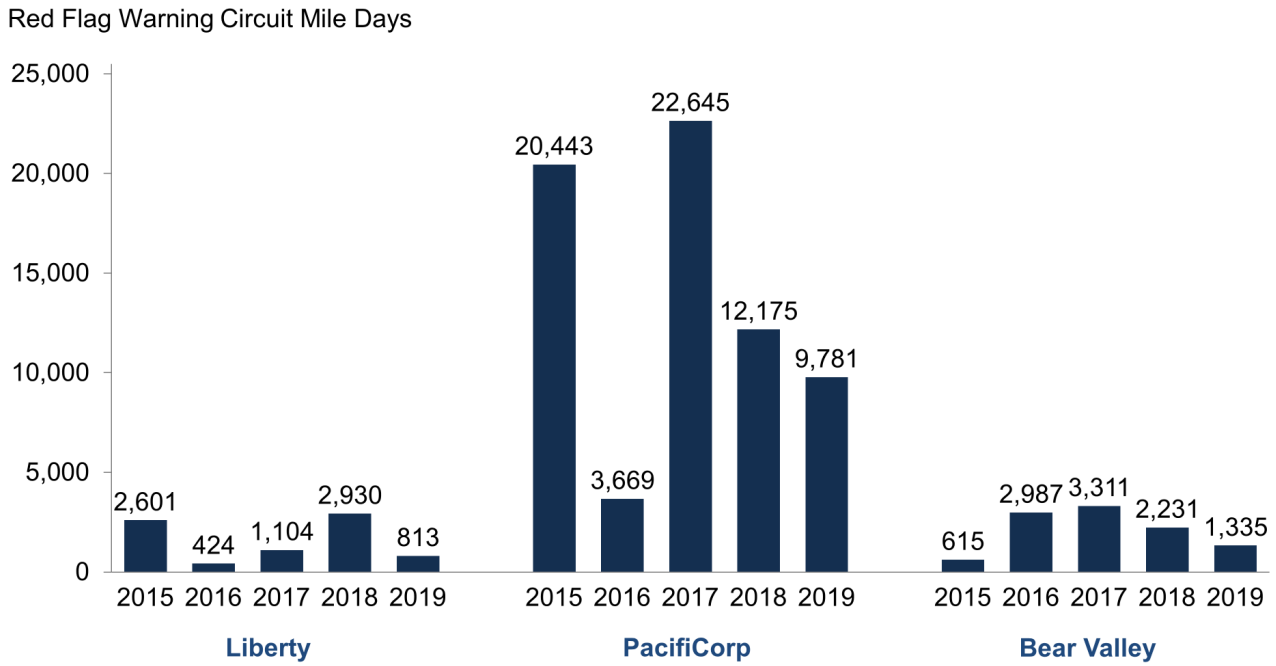
Figure 1.5a: Red flag warning circuit mile days per year by utility (Large utilities)



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

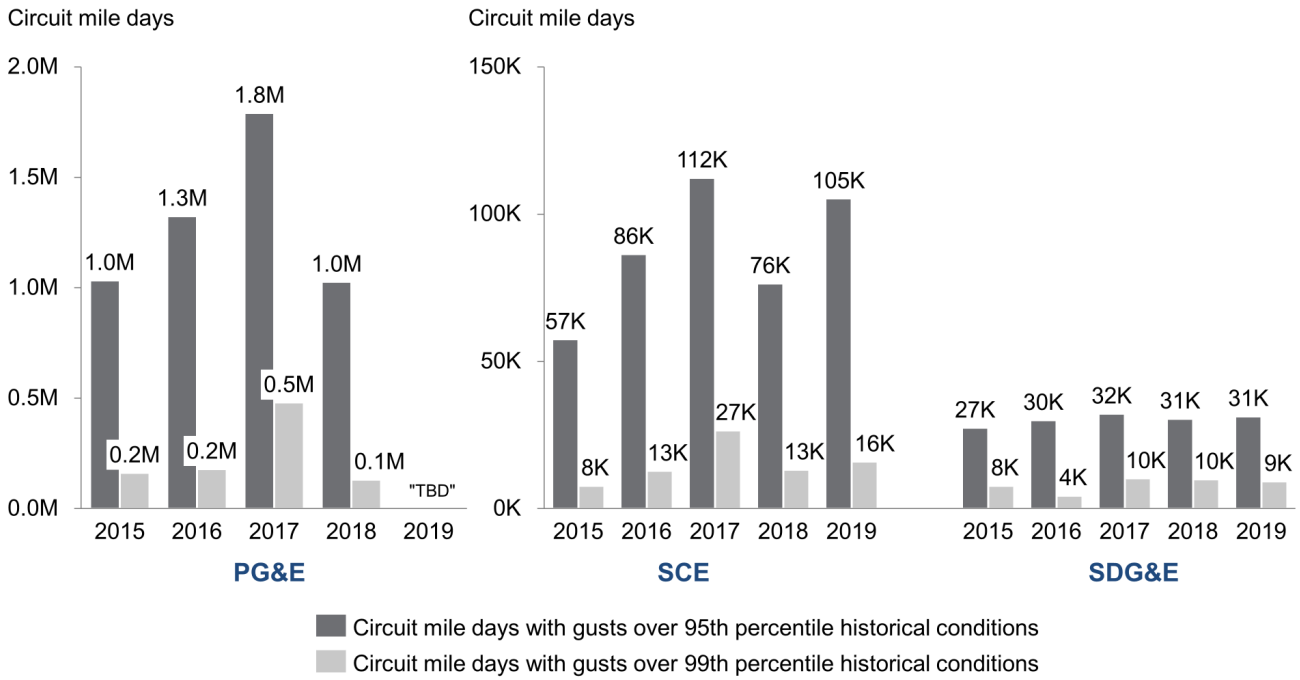
Figure 1.5b: Red flag warning circuit mile days per year by utility (Small utilities)



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.

Source: WMP Table 10

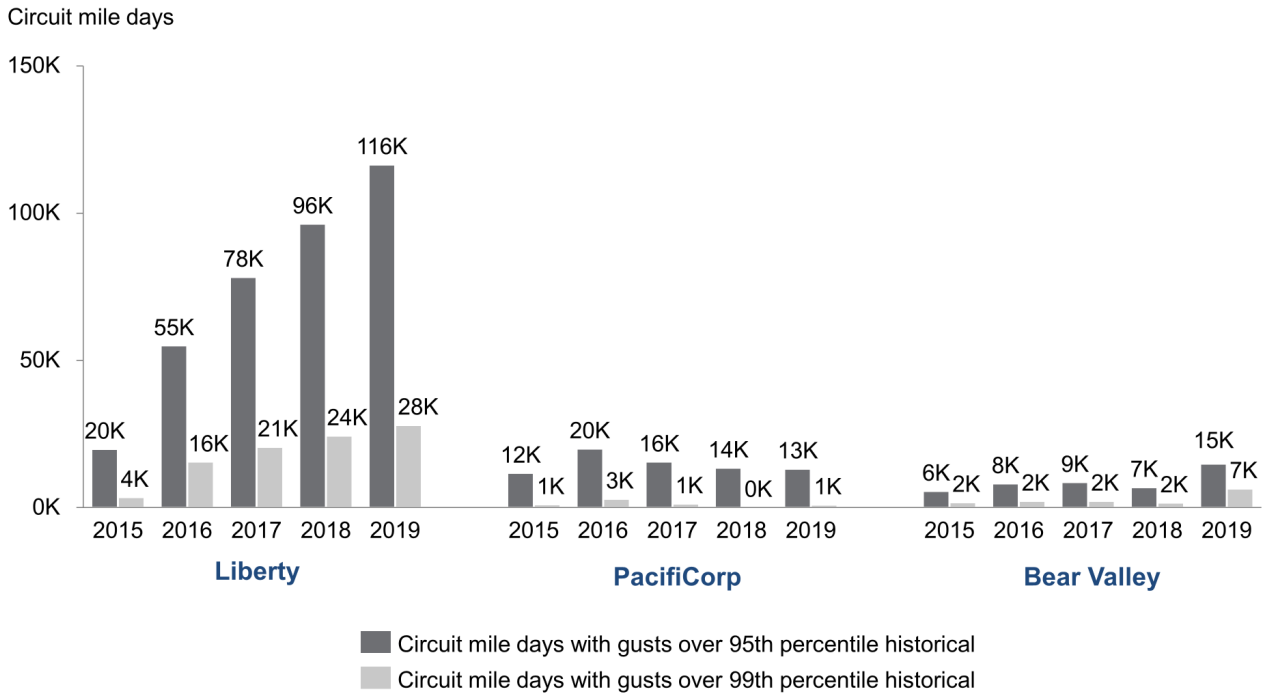
Figure 1.5c: 95th and 99th percentile wind conditions (Large utilities)



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)

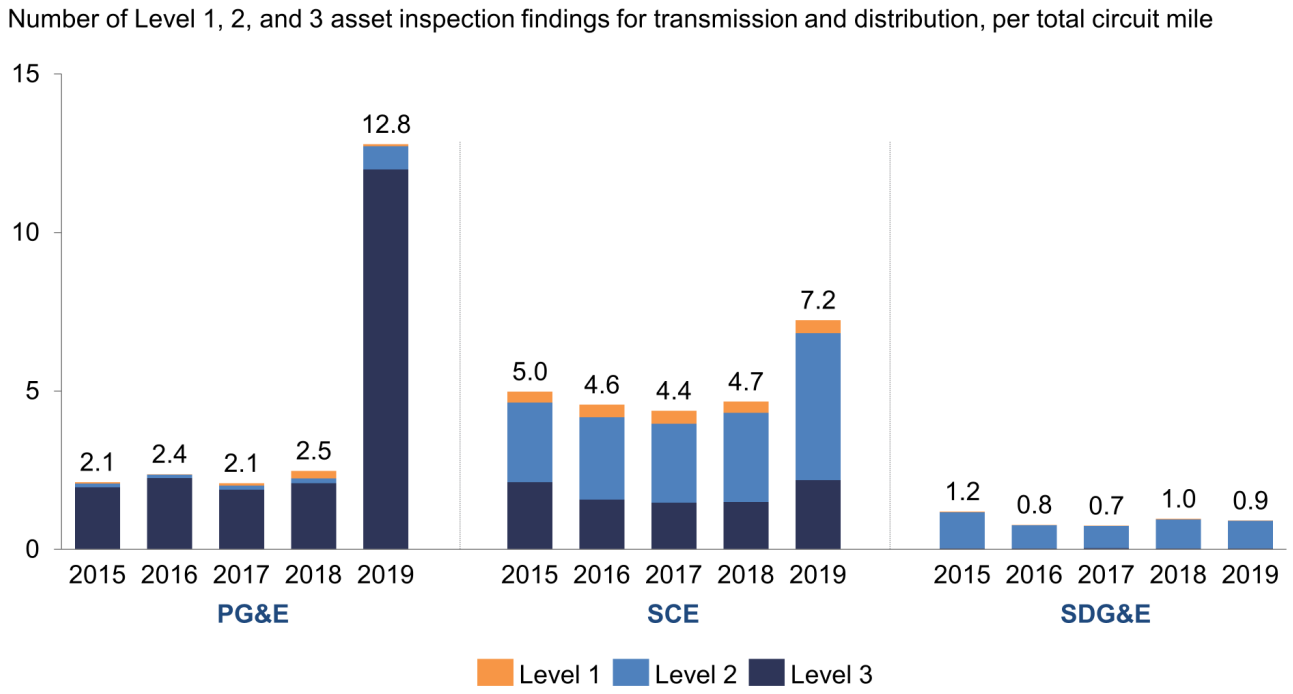


Note: Historical conditions refer to conditions over 10 prior years, 2005-2014.

Source: WMP Table 10

1.2 Outcome Metrics

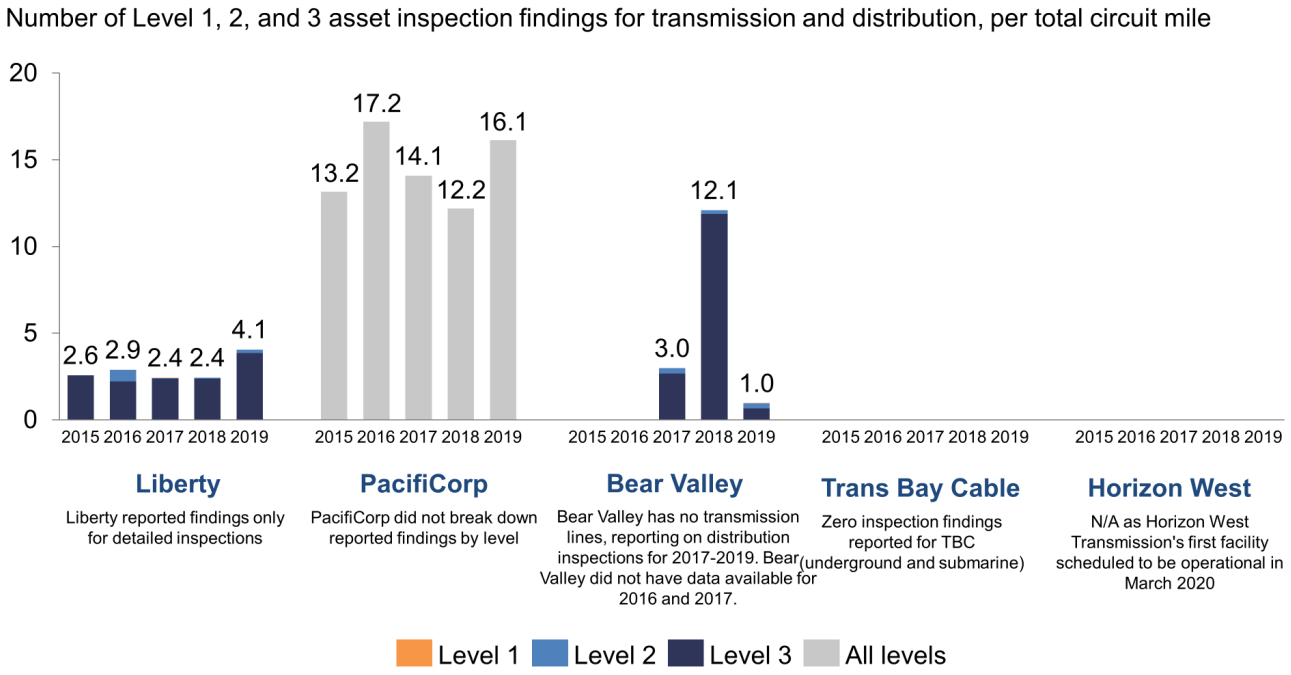
Figure 2.1a: Asset inspection findings normalized by total circuit mileage (Large utilities)



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

Source: WMP Table 1

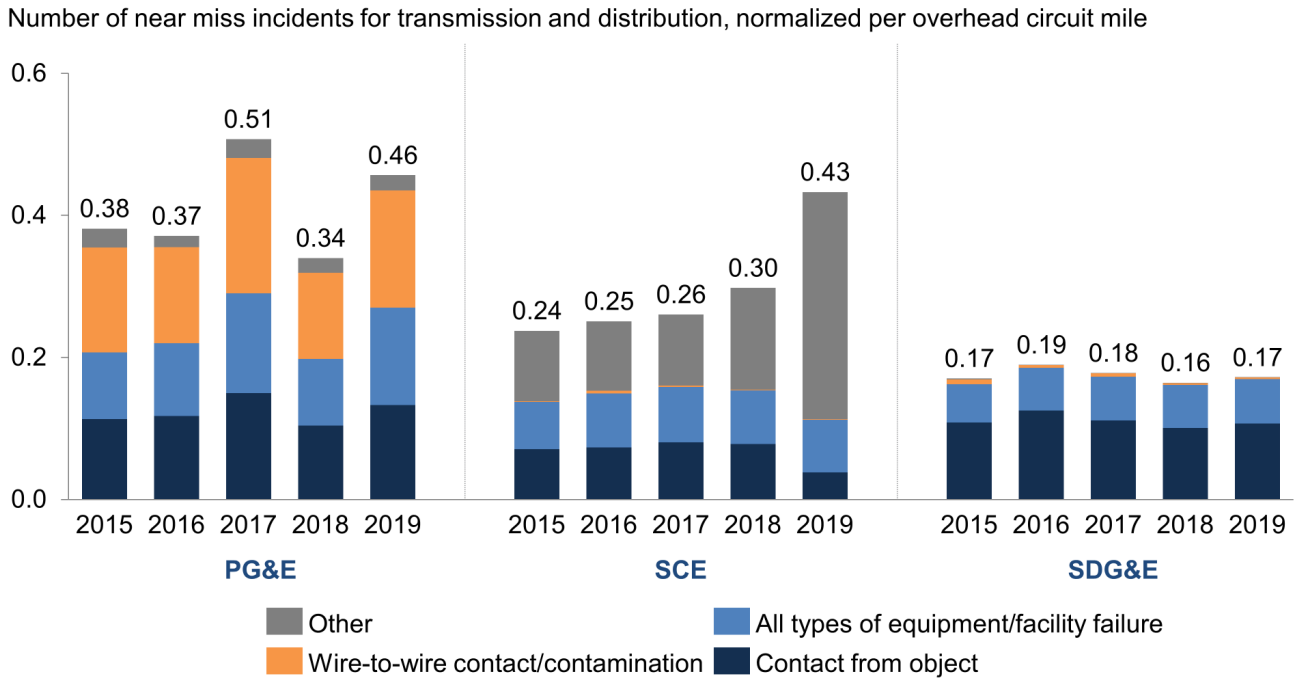
Figure 2.1b: Asset inspection findings normalized by total circuit mileage (Small utilities)



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.

Source: WMP Table 1

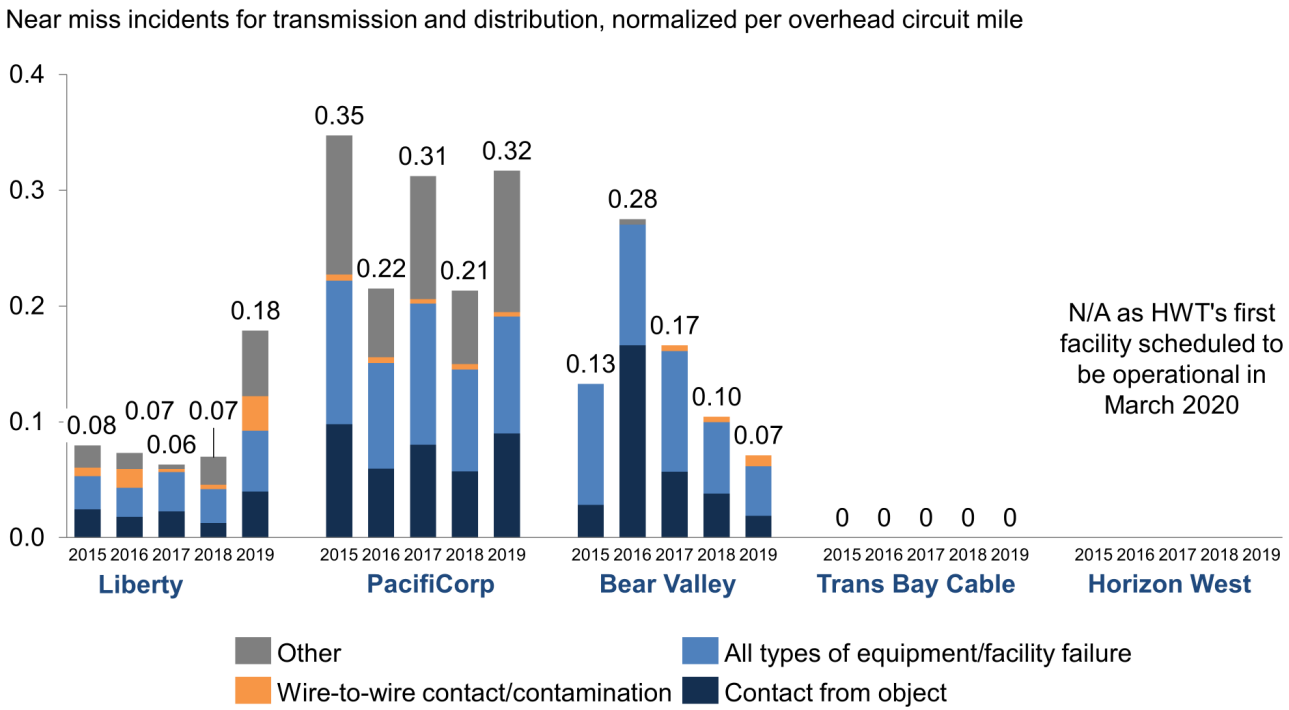
Figure 2.2a: Near miss incidents normalized by overhead circuit mileage (Large utilities)



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)

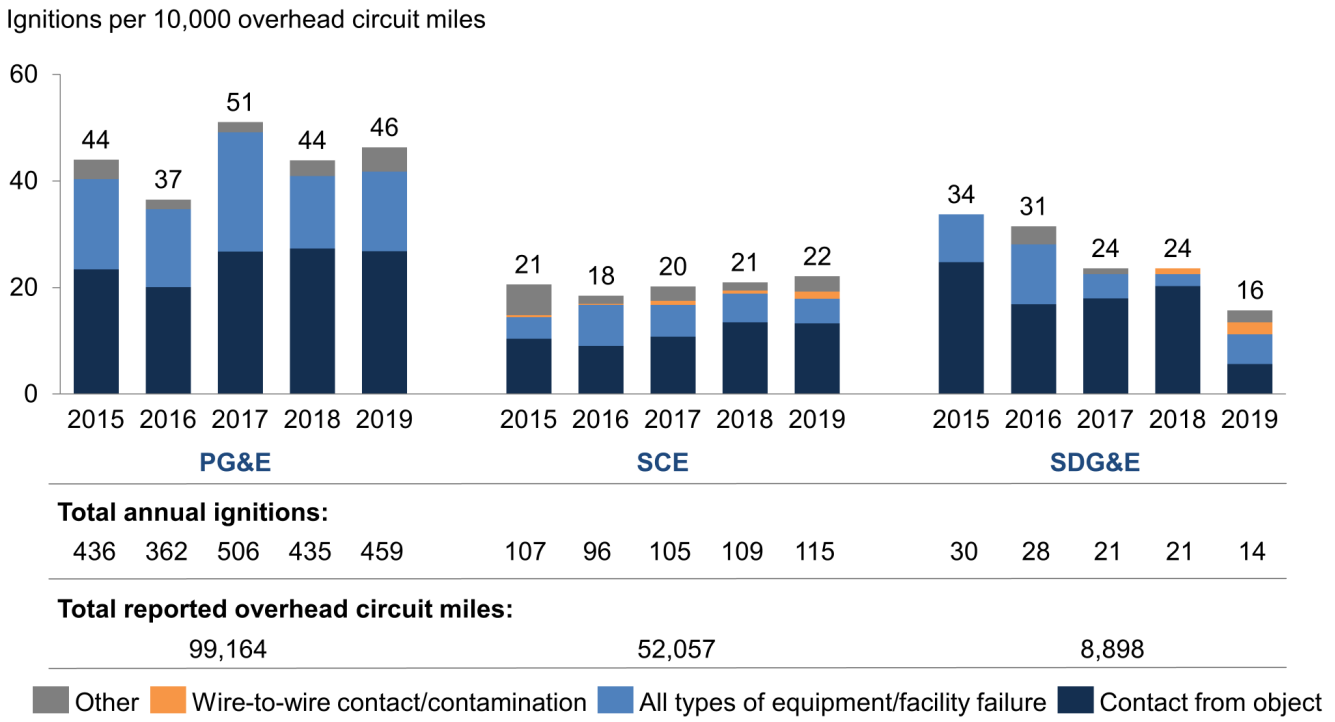


Note: The measurement of each 'near miss' is not yet perfectly standardized across utilities. The WSD will work toward a more standardized approach for tracking and classifying near miss data for 2021 WMPs. A near miss was defined in the 2020 WMP Guidelines as "An event with significant probability of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

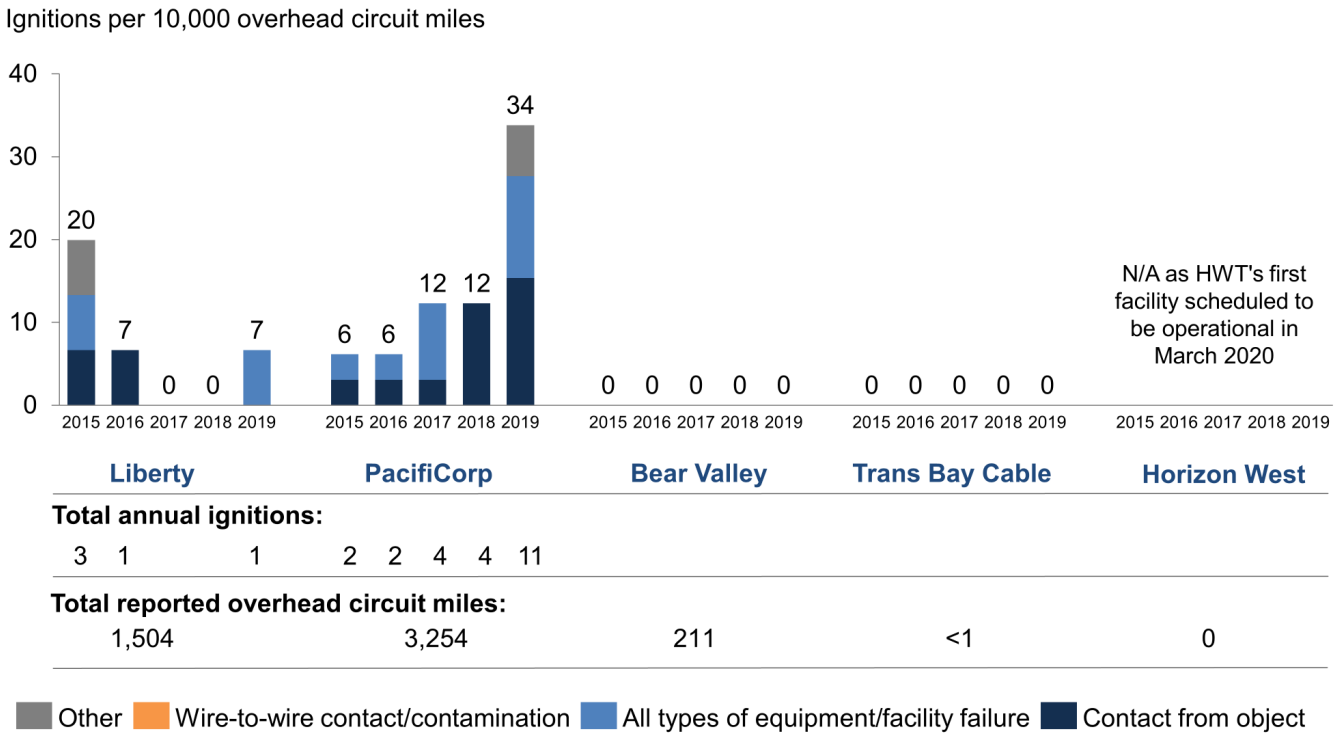
Source: Tables 11a and 11b from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs; BVES numbers adjusted to address inconsistencies in subtotal calculations provided.

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.

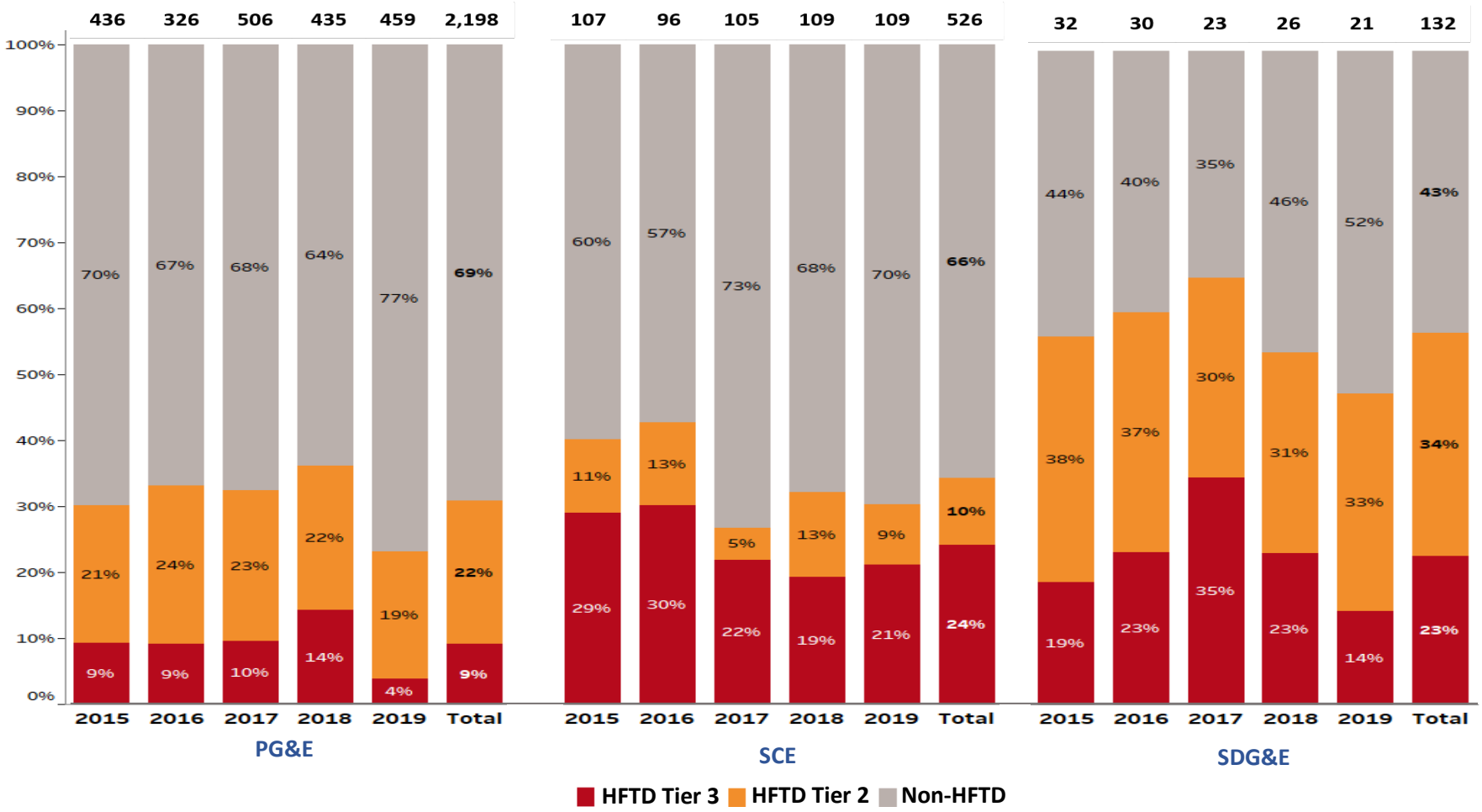
Figure 2.3b: Number of ignitions, normalized by overhead circuit mileage (Small utilities)



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

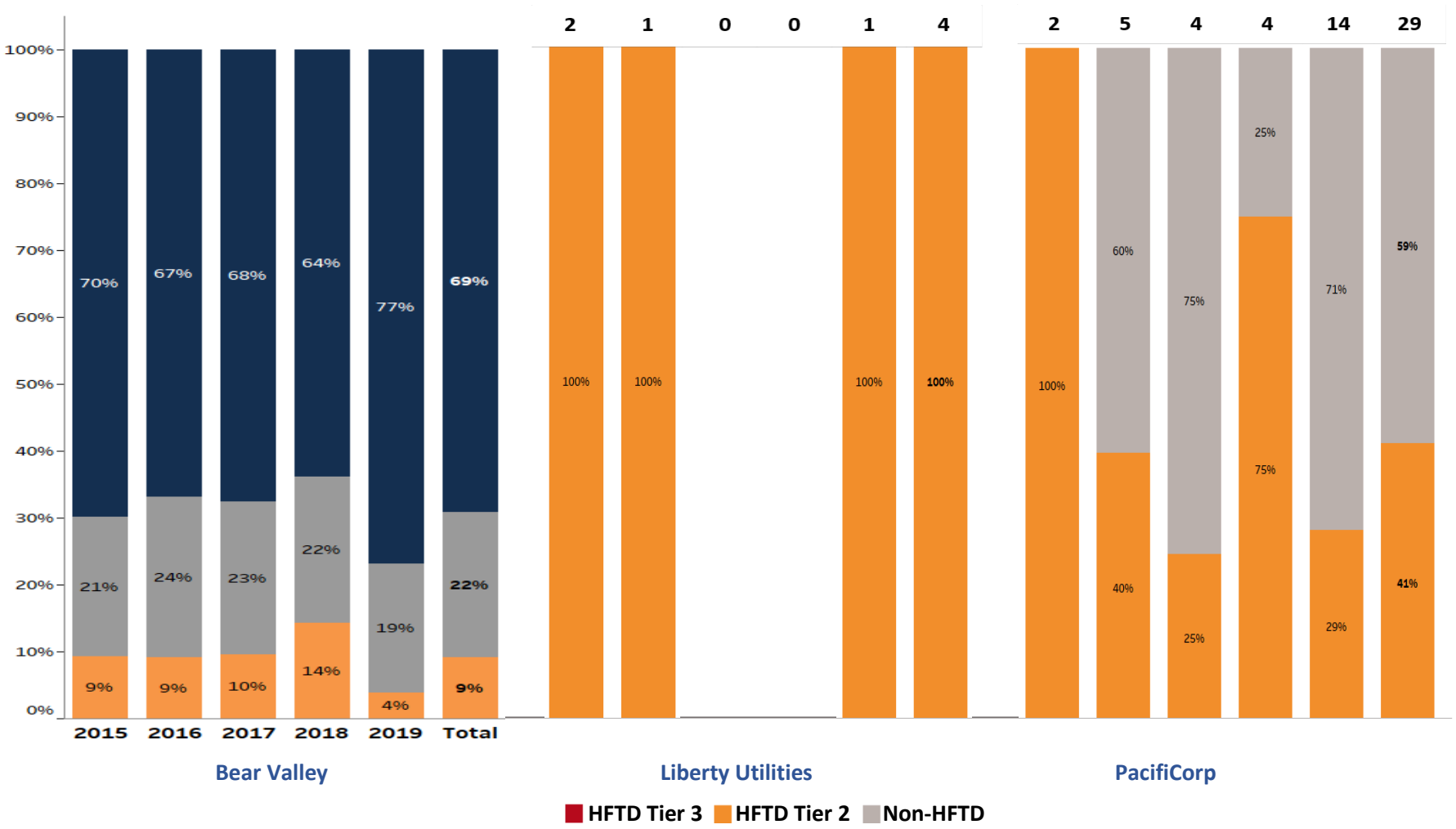
Source: Tables 11a and 11b from utility WMPs and data requests normalized by data from Table 13 of utility WMPs; PacifiCorp numbers adjusted to account for Tables 11c and 11d.

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



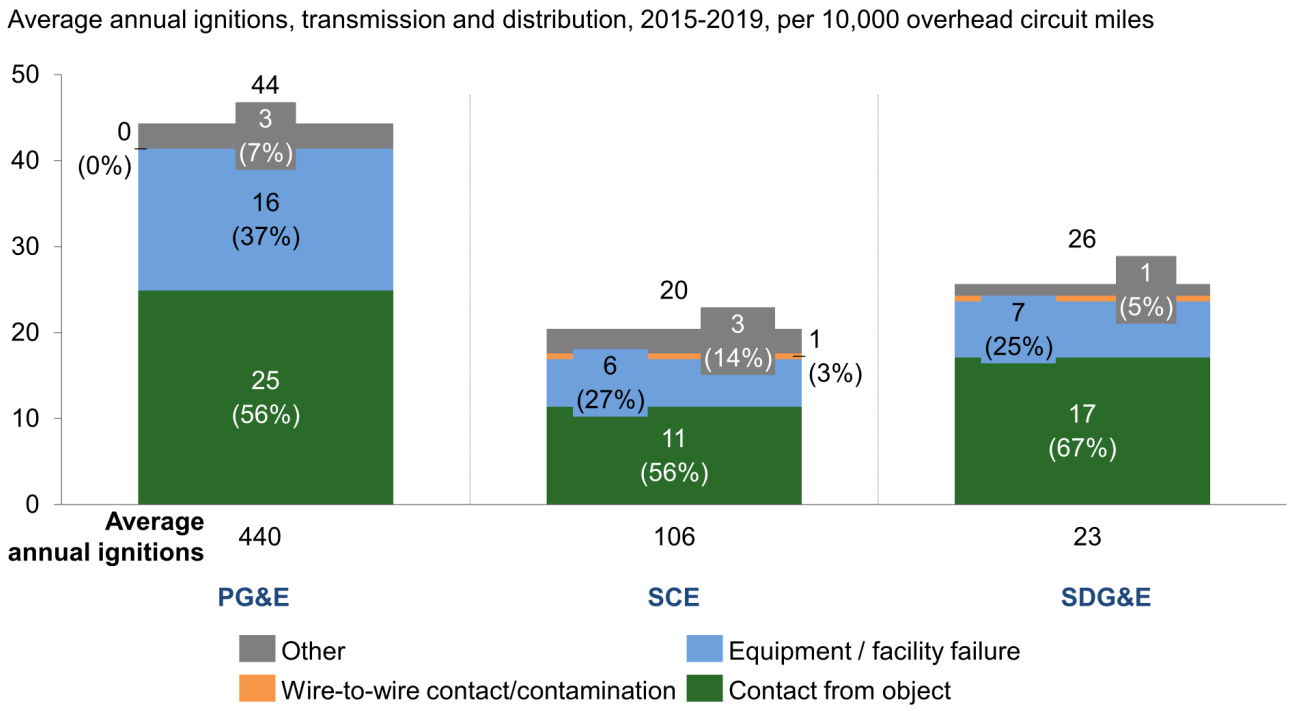
Note: Ignitions in Zone 1 HFTD areas make up less than 1% of total ignitions.
Source: Table 2 from utility WMPs

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



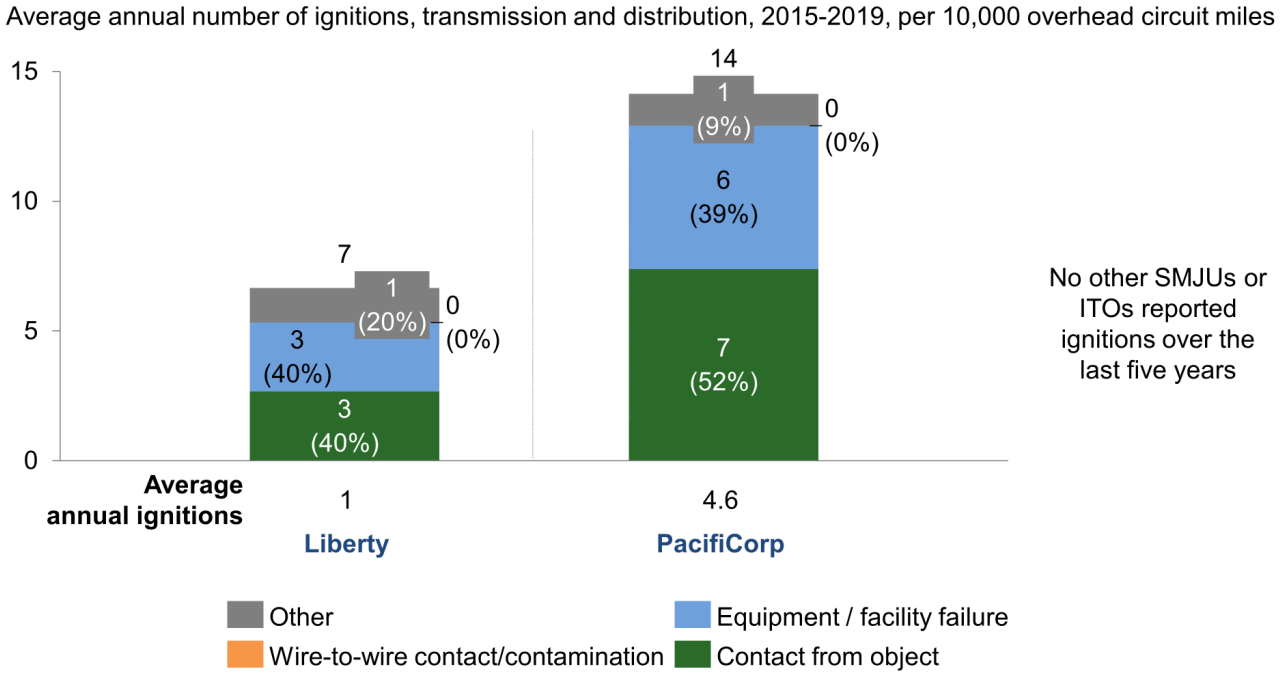
Note: Ignitions in Zone 1 HFTD areas make up less than 1% of total ignitions.
Source: Table 2 from utility WMPs

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.

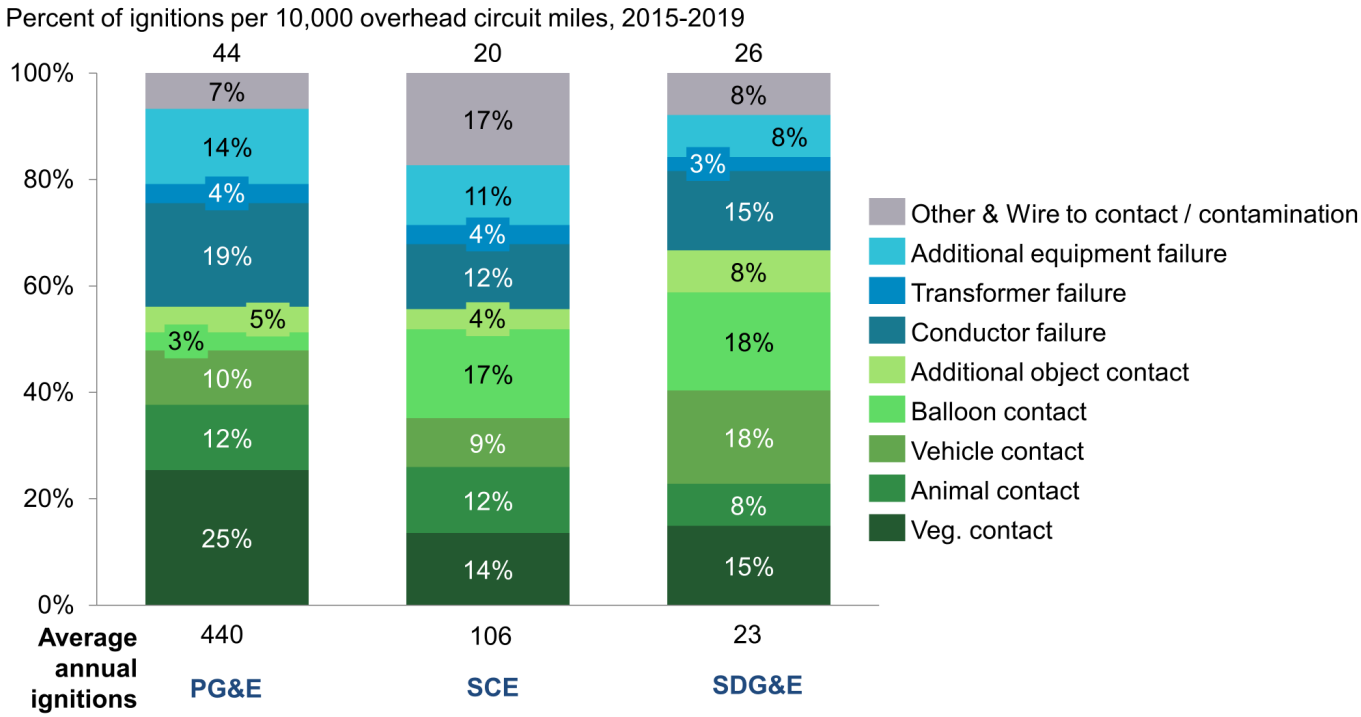
Figure 2.5b: Ignitions by ignition probability driver type (Small utilities)



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.

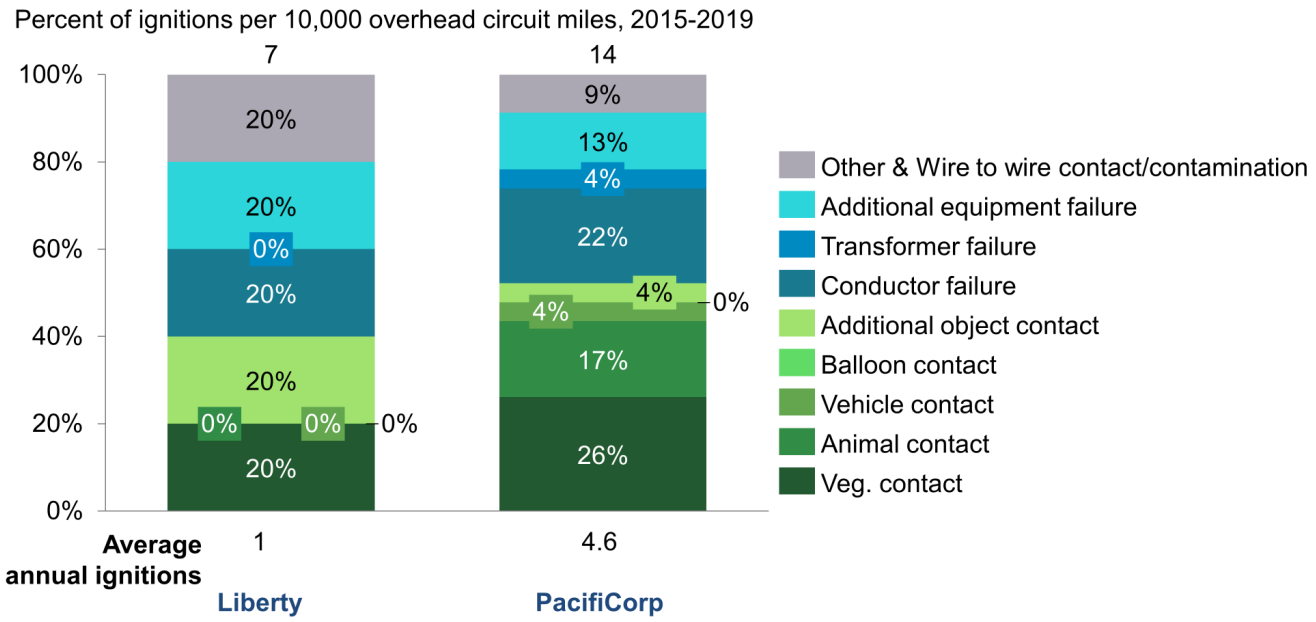
Figure 2.6a: Detail: Share of ignitions due to each ignition probability driver (Large utilities)



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)

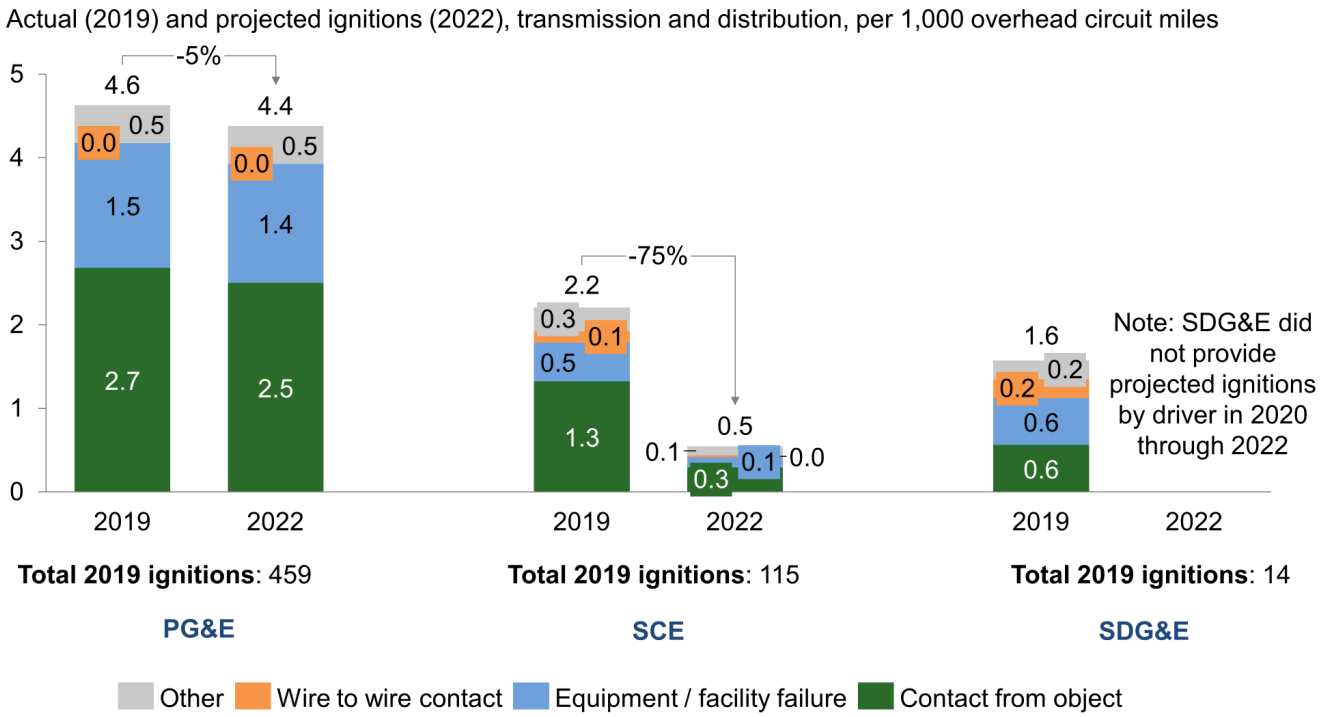


No other small utilities reported ignitions over the last five years

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



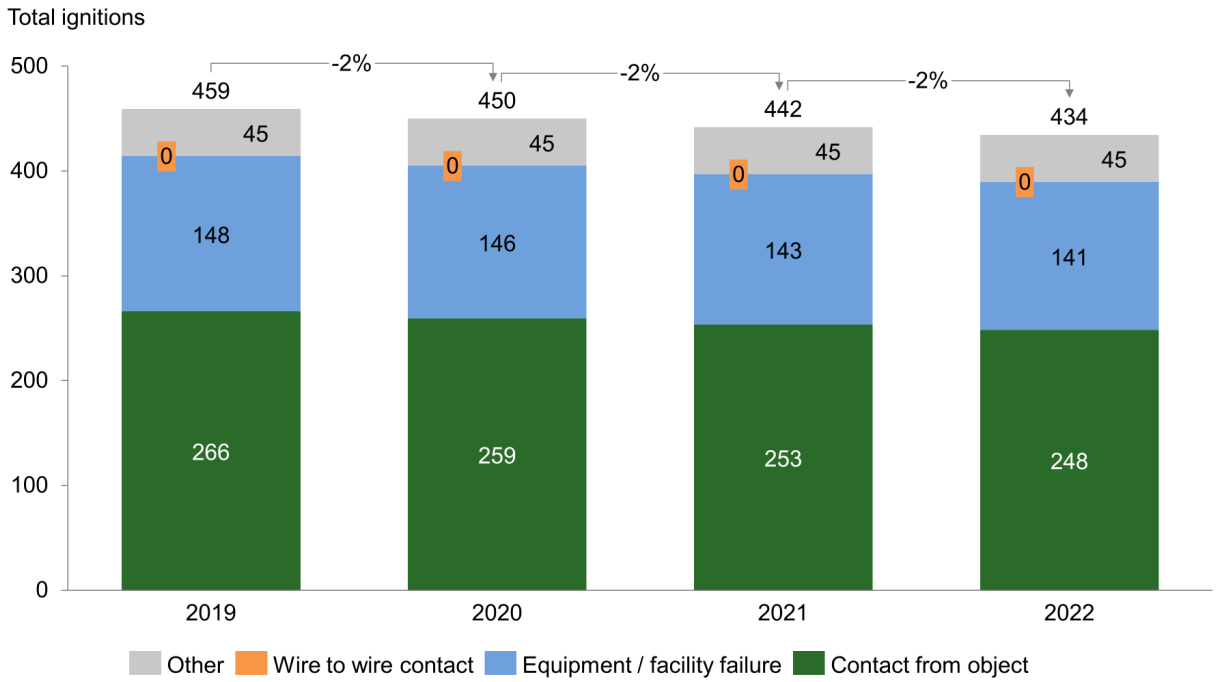
Note: Projections assume WMP implementation acording to plan and weather pattens consistent with 5 year historical average. See the 2020 WMP Guidelines for further detail.

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

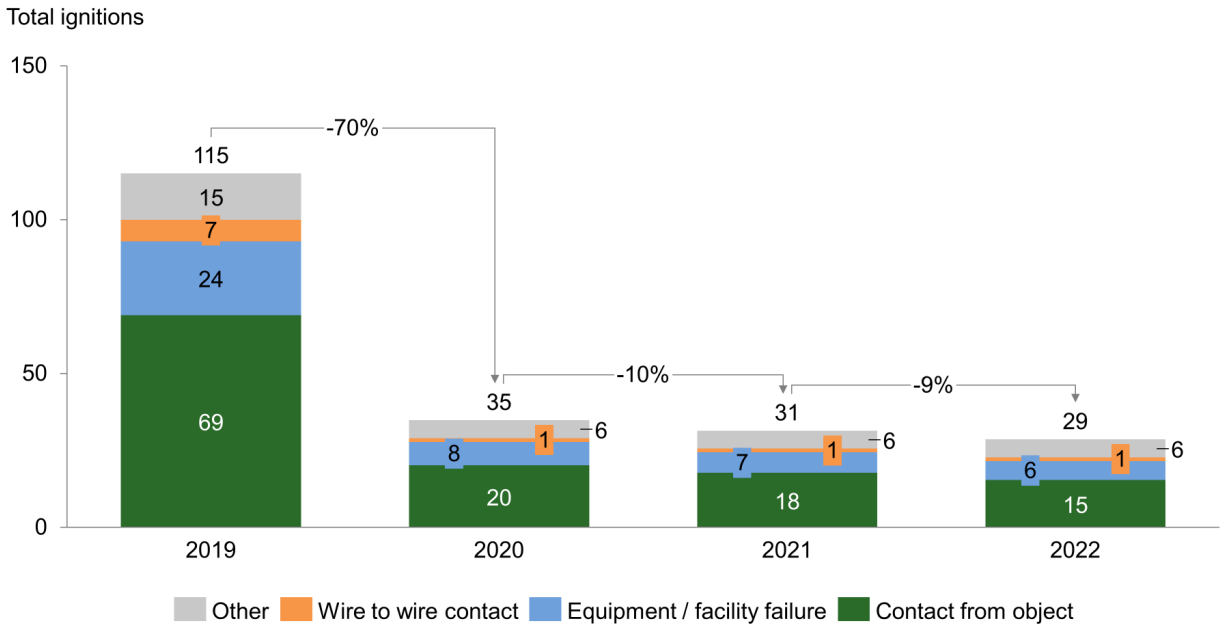


Note: Projections assume WMP implementation according to plan and weather patterns consistent with 5 year historical average. See the 2020 WMP Guidelines for more information on assumptions made.

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

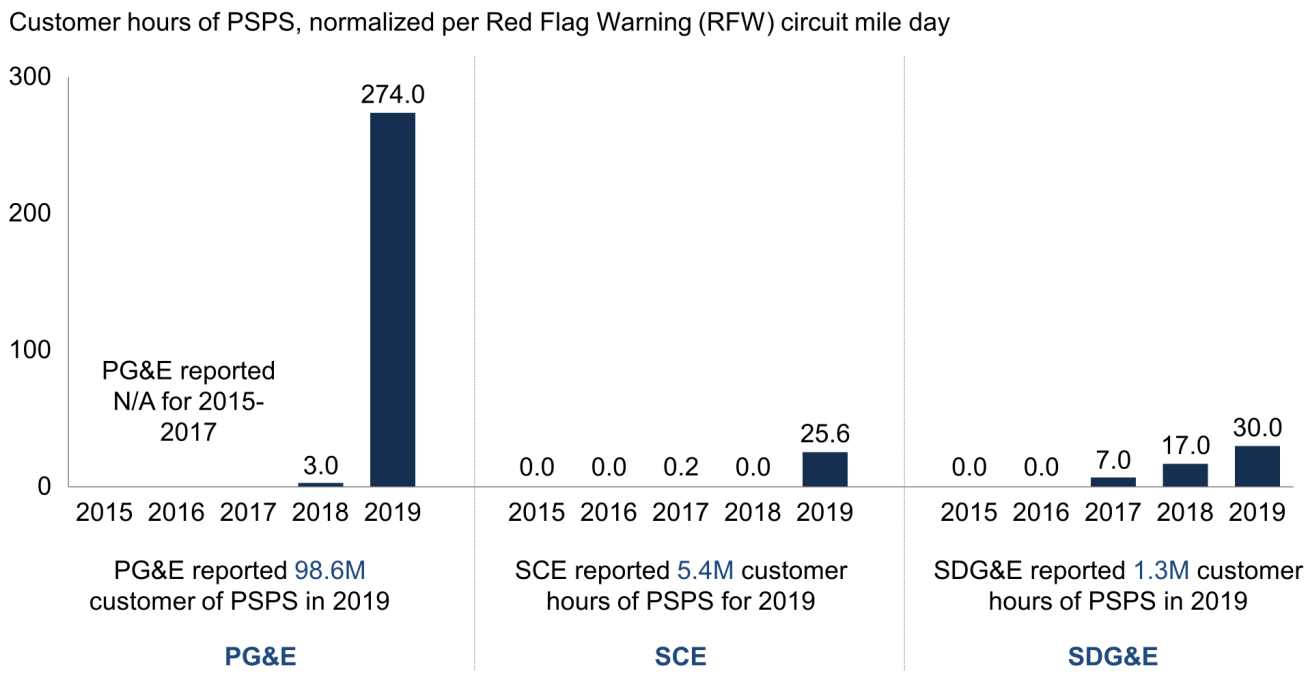
Figure shows reported 2019 ignitions and projected future ignitions by driver category, for transmission and distribution



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)

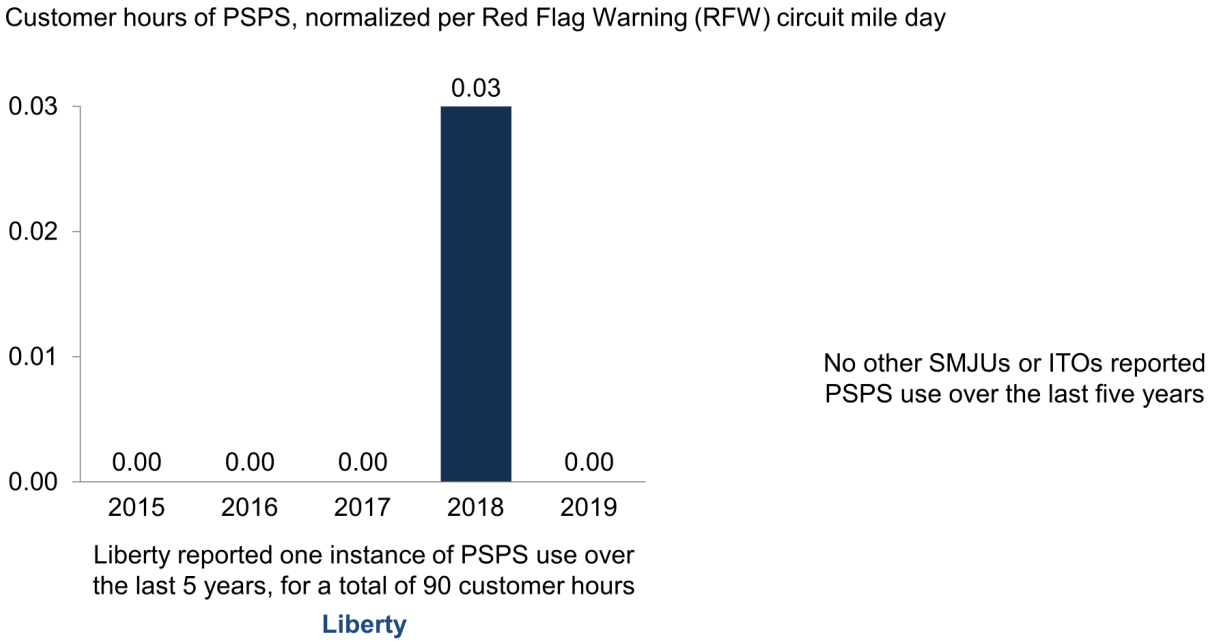


Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric; more detail is necessary to address potential inconsistencies in how each utility calculates this figure. A "Red Flag Warning (RFW) Circuit Mile Day" is intended to capture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

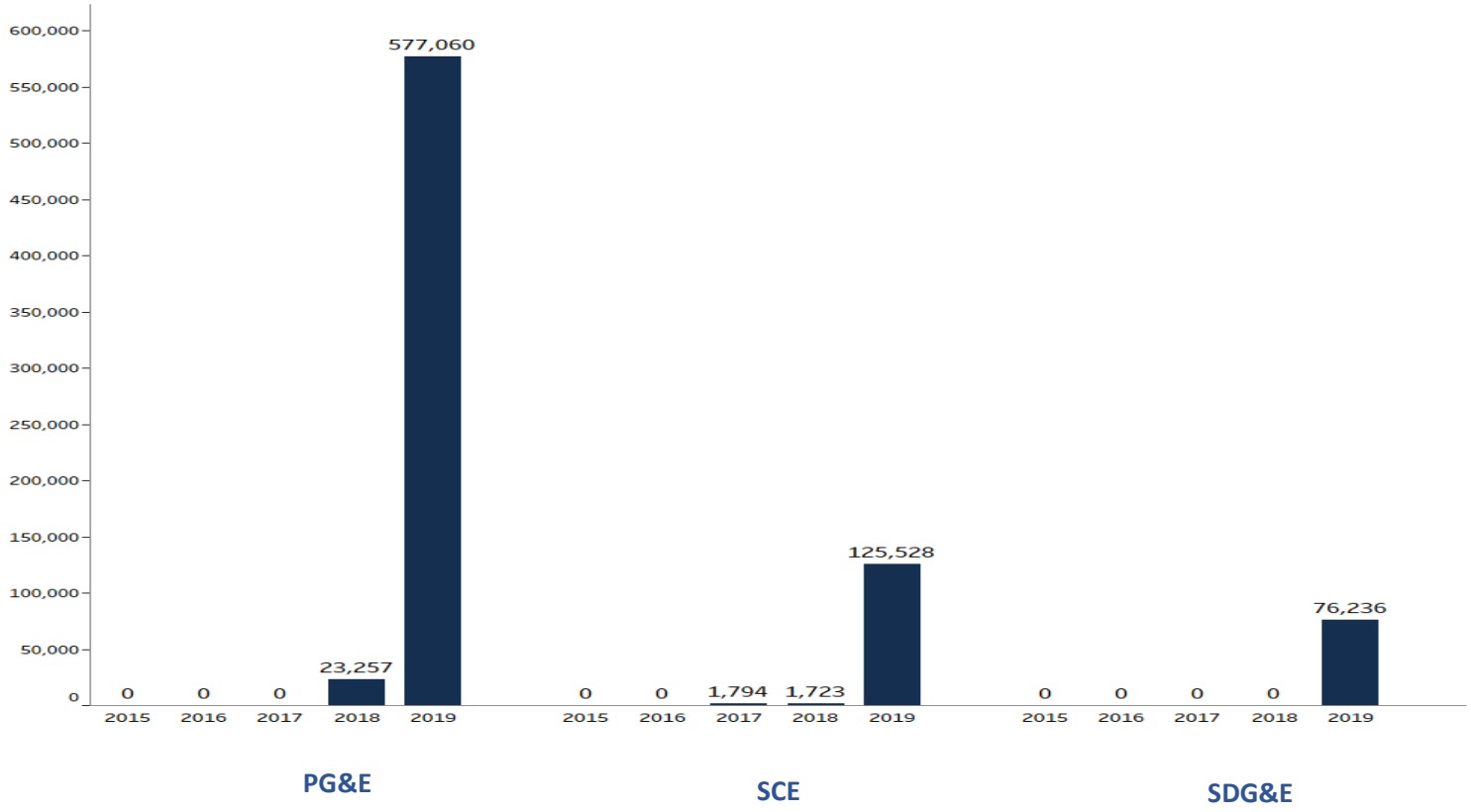


Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric; more detail is necessary to address potential inconsistencies in how each utility calculates this figure. A "Red Flag Warning (RFW) Circuit Mile Day" is intended to capture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

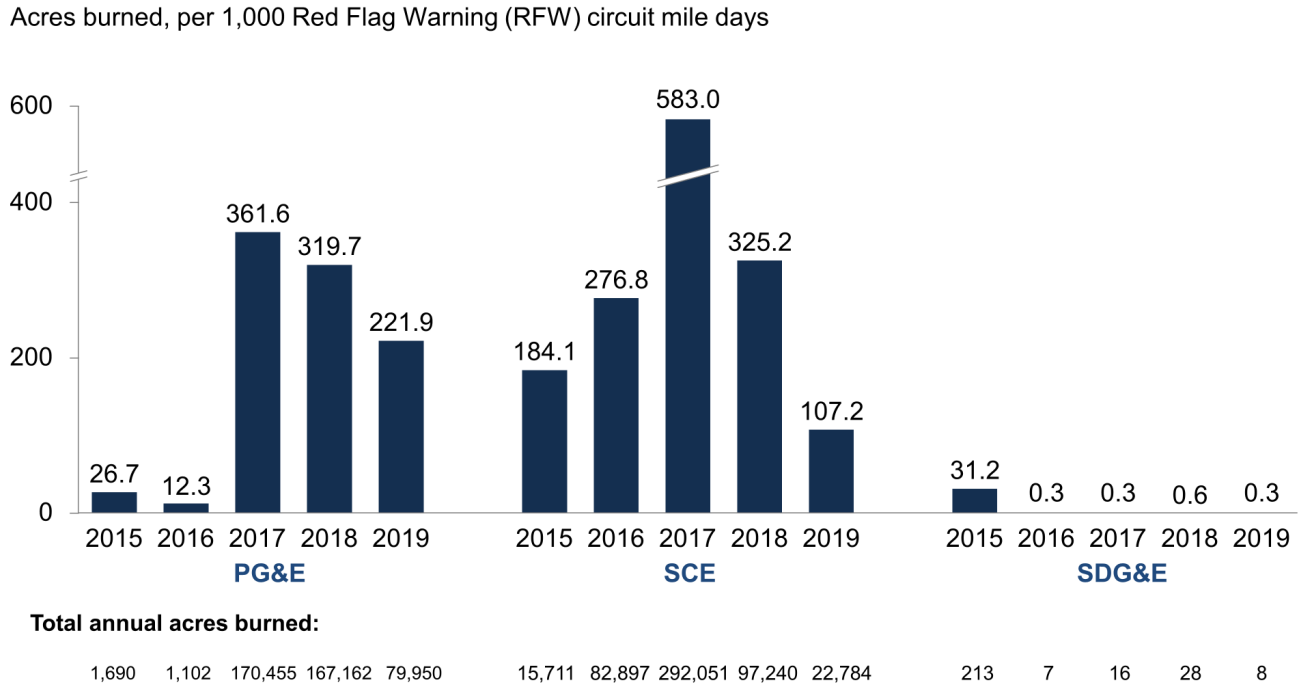
Figure 2.8c: PSPS impacts on critical infrastructure



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

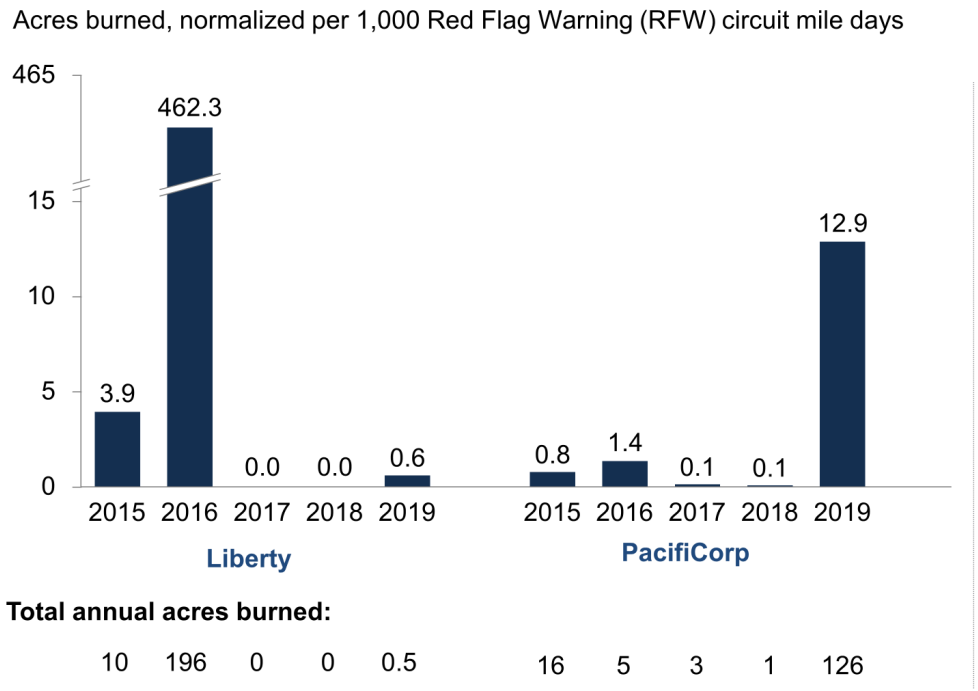
Figure 2.9a: Normalized area burned by utility ignited wildfire (Large utilities)



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)

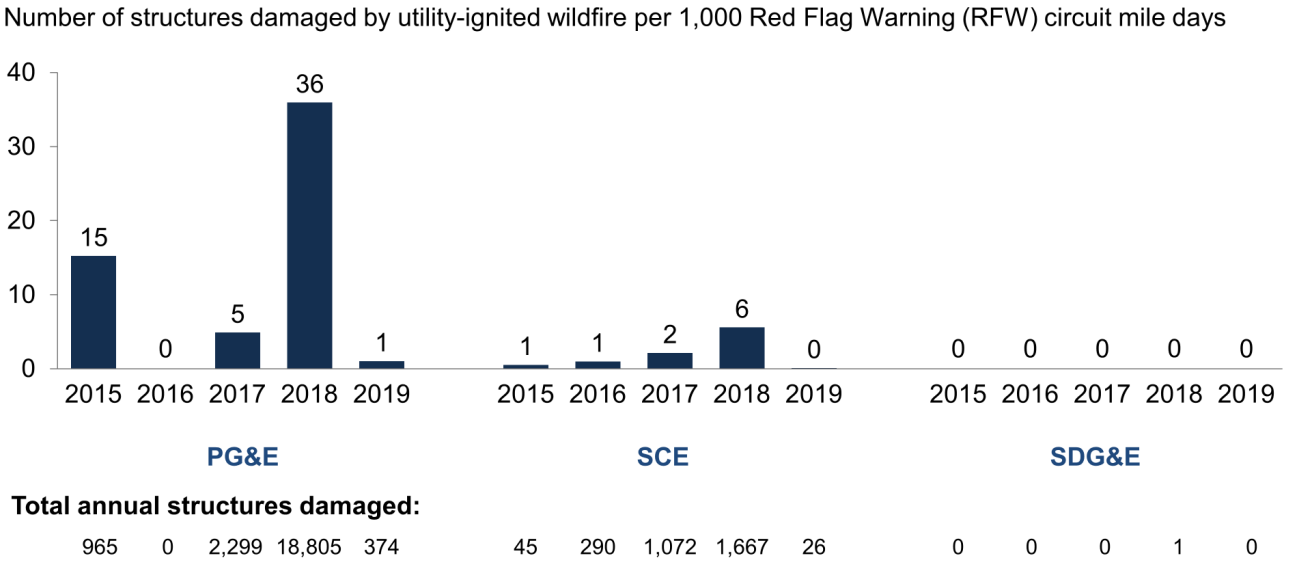


No other SMJUs or ITOs reported any area burned over the last 5 years

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



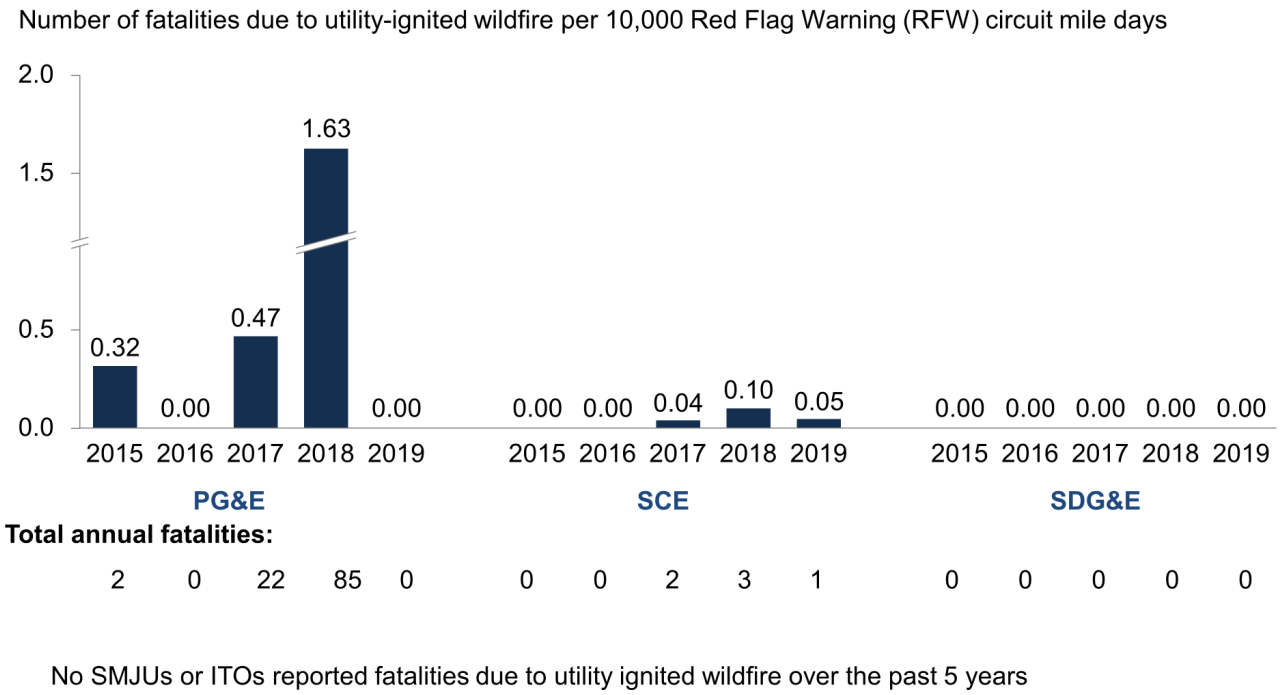
No SMJUs or ITOs reported number of structures damaged over the past 5 years

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)

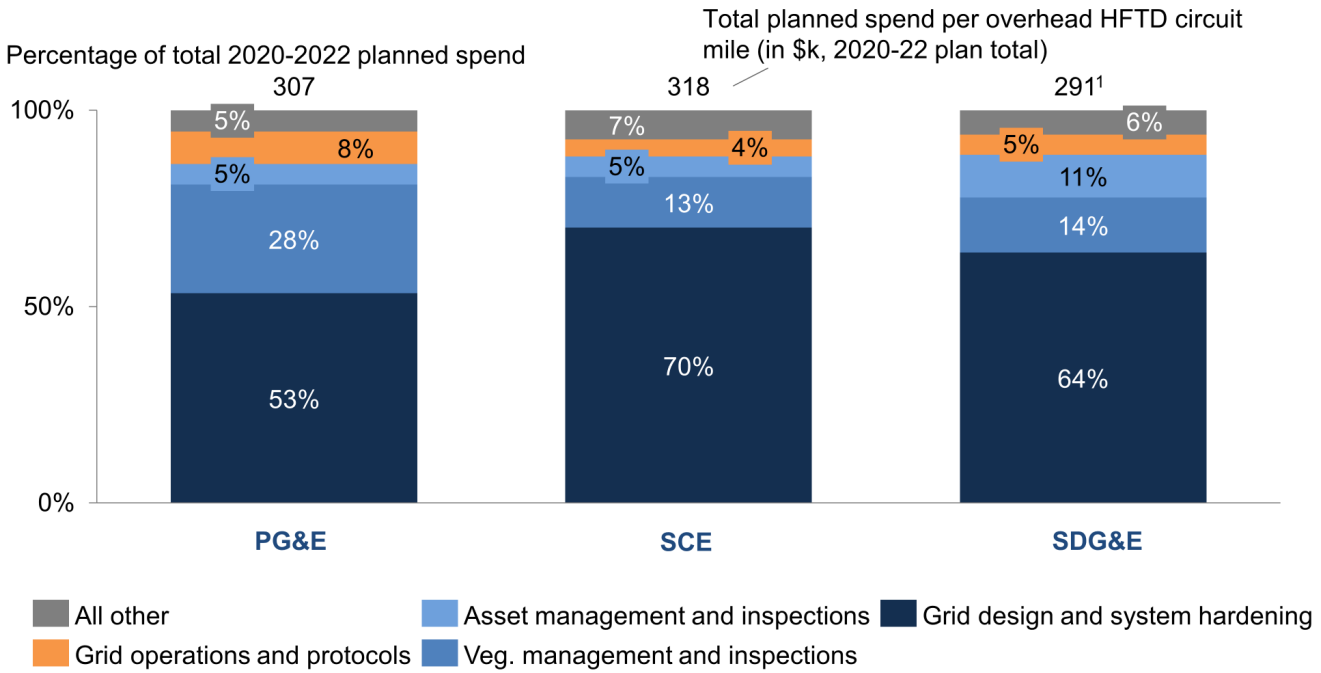
		Liberty	PacifiCorp	Bear Valley	Horizon West	Trans Bay Cable
Total spend	2019 planned spend	$4M	$1M	$12M	$0M	$0M
	2019 actual spend	$7M	$13M	$12M	$0M	$0M
	2020 planned spend	$30M	$26M	$84M	$4M	$0M
	2021 planned spend	$32M	$38M	$79M	$4M	$0M
	2022 planned spend	$27M	$37M	$79M	$0M	$0M
	Total planned spend 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.

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

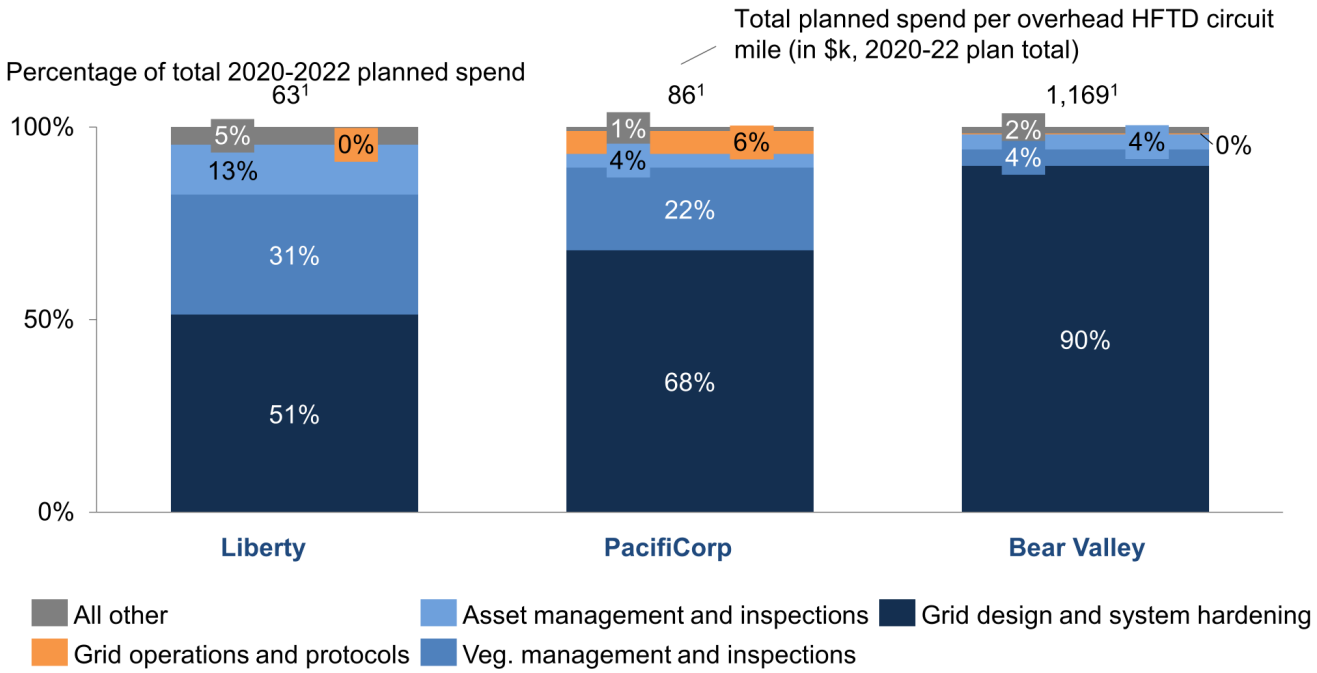
Figure 3.2a: Overview of total plan spend across utilities (Large utilities)



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.

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	
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.

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

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%**

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

Liberty Utilities Maturity Model Summary

0. Liberty Utilities: 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. Liberty Utilities: Maturity Model Summary

Contents

1.1 Liberty Utilities: 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: 1 2023: 1	• Liberty plans to increase its maturity level by 2023 in one of five capabilities. Specifically, by capability: • **1. Climate Scenario Modeling**: Liberty's survey responses project no growth in this capability but do indicate growth in two of the six relevant questions. Currently, Liberty is able to reliably estimate wildfire risk from various weather scenarios at the region-level. By 2023, Liberty plans to be able to categorize wildfire risk from weather by level of risk, as well as estimate risk with circuit-level granularity. • **2. Ignition Risk Estimation:** Liberty's survey responses project no growth in this capability and indicate no growth across the five relevant questions. Liberty uses a mostly automated tool with regional granularity that is based on characteristics and condition of lines, equipment, vegetation, and patterns to categorize the risk of ignition as high or low. • **3. Estimation of Wildfire Consequences for Communities:** Liberty's survey responses project growth in this capability. Currently, Liberty uses a partially automated tool to estimate the risk of ignition and does not translate this into potential consequences for communities. By 2023, Liberty plans to use a mostly automated tool to estimate risk of ignition, and then categorize ignition events as low or high risk to communities. • **4. Estimation of wildfire and PSPS risk-reduction impact:** Liberty's survey responses project no growth in this capability and indicate no growth across the five relevant questions. Liberty estimates wildfire and PSPS risk reduction impact of initiatives with regional granularity using a mostly automated tool that categorizes risk reduction categorically (e.g., high, medium, low). • **5. Risk maps and simulation algorithms**: Liberty's survey responses project no growth in this capability and indicate no growth across the five relevant questions. Liberty has no defined process for updating risk mapping algorithms and does not calculate deviations from risk model.
B. Situational awareness and forecasting Median automated maturity levels:	• Liberty plans to increase its maturity level by 2023 in one of five capabilities. Specifically, by capability: • **6. Weather variables collected:** Liberty's survey responses project no growth in this capability and indicate no growth across the four relevant questions. Liberty uses a range of accurate weather variables from multiple sources—as well as predicted values of other non-measured variables (e.g., fuel moisture content)—in its forecasting.

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020 2022 WMP period
2020: 1 2023: 2	• **7. Weather data resolution:** Liberty's survey responses project no growth in this capability but do indicate growth in one of four relevant questions. Currently, Liberty uses an automated process to collect data at least four times an hour in HFTD areas. By 2023, Liberty plans to use an automated process to collect data at least four times an hour along the entire grid in addition to all areas needed to predict weather across the grid. • **8. Weather forecasting ability:** Liberty's survey responses project no growth in this capability but do indicate growth in one of five relevant questions. Currently, Liberty has an independent weather forecasting ability that is sufficiently accurate to fulfill PSPS requirements. By 2023, Liberty plans to have the ability to use a combination of accurate weather stations and external weather data to make accurate forecasts. • **9. External sources used in weather forecasting:** Liberty's survey responses project no growth in this capability and indicate no growth across the three relevant questions. Liberty uses a combination of weather stations and external weather data to create a single visual configurable live map to help inform decision making. • **10. Wildfire detection processes and capabilities:** Liberty's survey responses project growth in this capability. Currently, Liberty does not have well-defined procedures for detecting ignitions along the grid. By 2023, Liberty plans to have well-defined procedures for detecting ignitions along the grid.
C. Grid design and system hardening Median automated maturity levels: 2020: 0 2023: 1	• Liberty plans to increase its maturity level by 2023 in two of five capabilities. Specifically, by capability: • **11. Approach to prioritizing initiatives across territory:** Liberty's survey responses project no growth in this capability and indicate no growth in the single relevant question. Liberty prioritizes risk reduction initiatives based on geography and conditions within only HFTD areas. • **12. Grid design for minimizing ignition risk:** Liberty's survey responses project no growth in this capability but do indicate growth in one of the four relevant questions. Currently, Liberty does not provide micro grids or islanding where traditional grid infrastructure is impracticable and wildfire risk is high. By 2023, Liberty plans to provide micro grids or islanding where traditional grid infrastructure is impracticable and wildfire risk is high. • **13. Grid design for resiliency and minimizing PSPS:** Liberty's survey responses project no growth in this capability and indicate no growth in the four relevant questions. Liberty's transmission architecture has many single points of failure and its distribution architecture—which is sectionalized to have switches in HFTD areas to individually isolate circuits—has (n-1) redundancy covering at least 50% of its customers in HFTD. • **14. Risk based hardening and cost efficiency:** Liberty's survey responses project growth in this capability. Currently, Liberty has no clear understanding of the relative risk spend efficiency of grid hardening initiatives.

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020 2022 WMP period
	By 2023, Liberty plans to have an accurate understanding of the relative cost and effectiveness of different initiatives. • **15. Grid design and asset innovation:** Liberty's survey responses project growth in this capability. Currently, Liberty has no established program for evaluating the risk spend efficiency of new grid hardening initiatives; results of pilot and commercial deployments are shared with a limited set of partners. By 2023, Liberty plans to evaluate new grid hardening initiatives based on installation into grid and measurement of direct reduction in ignition events; Liberty also plans to share results of pilot and commercial deployments extensively with industry players, academia, and other utilities.
D. Asset management and inspections Median automated maturity levels: 2020: 0 2023: 1	• Liberty plans to increase its maturity level by 2023 in three of five capabilities. Specifically, by capability: • **16. Asset inventory and condition assessments:** Liberty's survey responses project no growth in this capability but do indicate growth in all four relevant questions. Currently, there is no service territory-wide inventory of electric lines and equipment, and no system or approach is in place to detect or respond to malfunctions likely to cause ignition in HFTD areas. By 2023, Liberty plans to have an accurate inventory of equipment that may contribute to wildfire risk (with condition assessments updated annually at the asset-level) and to have a system and approach in place to reliably detect incipient malfunctions likely to cause ignition in HFTD areas. • **17. Asset inspection cycle:** Liberty's survey responses project no growth in this capability but do indicate growth in three of the eight relevant questions. Currently, patrol inspections are consistent with minimum regulatory requirements and are based on annual / periodic schedules; other inspections are also based on annual / periodic schedules. By 2023, Liberty plans to have patrol inspections above minimum regulatory requirements, with more frequent inspections for highest risk equipment, and to have scheduling be based on up-to-date static maps of equipment types and environments; other inspections are also planned to be scheduled based on up-to-date static maps of equipment types and environment. • **18. Asset inspection effectiveness:** Liberty's survey responses project growth in this capability. Currently, Liberty's patrol, detailed, and other inspection procedures and checklists do not include all items required by statute and regulations, are based on statute and regulatory guidelines only, and are customized at the span-level. By 2023, Liberty plans to include all items required by statute and regulations in its patrol, detailed, and other inspection procedures and checklists, and for the procedures and checklists to be based on vegetation type, equipment type, age, and condition; procedures and checklists are planned to be customized at the asset-level. • **19. Asset maintenance and repair:** Liberty's survey responses project growth in this capability. Currently, Liberty maintains lines and equipment as required by regulation, and procedures do not take wildfire risk, performance history, or past operating conditions into account. By 2023, Liberty plans to do additional

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020 2022 WMP period
	maintenance in areas of grid at highest risk of wildfire, and for procedures and checklists to take wildfire risk into account. • **20. QA/QC for asset management:** Liberty's survey responses project growth in this capability. Currently, there is a lack of controls for auditing completed contractor work, and workforce management software tools are not used. By 2023, Liberty plans to audit contractor activity through an established process, using workforce management software tools as well as QA/QC information to identify deficiencies in quality of work and inspections performance.
E. Vegetation management and inspections Median automated maturity levels: 2020: 0.5 2023: 1.5	• Liberty plans to increase its maturity level by 2023 in two of six capabilities. Specifically, by capability: • **21. Vegetation inventory and condition assessments:** Liberty's survey responses project growth in this capability. Currently, inspections are not independently verified by third party experts. By 2023, Liberty plans for inspections to be independently verified by third party experts. • **22. Vegetation inspection cycle**: Liberty's survey responses project no growth in this capability but do indicate growth in one of the three of the relevant questions. Currently, all types of vegetation inspections are consistent with minimum regulatory requirements. By 2023, Liberty plans to have more frequent inspections in the highest risk areas. • **23. Vegetation inspection effectiveness**: Liberty's survey responses project no growth in this capability and do not indicate growth across the four relevant questions. Patrol, detailed, enhanced, and other procedures and checklists include all items required by statute and regulations, are based on predictive modeling, and are customized across the service area. • **24. Vegetation grow-in mitigation**: Liberty's survey responses project no growth in this capability and do not indicate growth across the nine relevant questions. Liberty meets minimum statutory and regulatory clearances around all lines and equipment's during all seasons. • **25. Vegetation fall-in mitigation**: Liberty's survey responses project no growth in this capability but do indicate growth across one of the seven relevant questions. Currently, Liberty systematically removes vegetation outside of its right of way but does not work with partners to identify new cost effective uses for vegetation. By 2023, Liberty plans to work with partners to identify new cost effective uses for vegetation, taking into consideration environmental impacts and emissions of vegetation waste. • **26. QA/QC for vegetation management**: Liberty's survey responses project growth in this capability. Currently, there is a lack of controls for auditing work completed by employees or subcontractors. By 2023, Liberty plans to audit contractor activity through an established process, using QA/QC information to identify deficiencies in quality of work and inspections performance.

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020 2022 WMP period
F. Grid operations and protocols Median automated maturity levels: 2020: 0.5 2023: 1	• Liberty plans to increase its maturity level by 2023 in one of six capabilities. Specifically, by capability: • **27. Protective equipment and device settings**: Liberty's survey responses project no growth in this capability and do not indicate growth across the three relevant questions. Liberty uses a manual process to adjust sensitivity of risk reduction elements during high threat weather conditions. • **28**. **Incorporating ignition risk factors in grid control:** Liberty's survey responses project no growth in this capability and do not indicate growth across the four relevant questions. Liberty has a clearly explained process for determining whether to operate the grid beyond current or voltage decisions. • **29. PSPS op. model and consequence mitigation:** Liberty's survey responses project no growth in this capability but do indicate growth across one of the six relevant questions. Currently, Liberty forecasts PSPS events accurately, with fewer than 25% of predictions being false positives, but does not provide all affected customers with resources to alleviate the impact of the power shutoff. By 2023, Liberty plans to continue forecasting PSPS events accurately, with fewer than 25% of predictions being false positives, and to provide all affected customers with resources to alleviate the impact of the power shutoff. • **30. Protocols for PSPS initiation:** Liberty's survey responses project no growth in this capability but do not indicate growth across the four relevant questions. Liberty has explicit policies and explanation for the thresholds above which PSPS is activated as a measure of last resort, which take into account a partially automated system which recommends circuits for which PSPS should be activated. • **31. Protocols for PSPS re-energization:** Liberty's survey responses project no growth in this capability but do indicate growth across one of the four relevant questions. Currently, there is an inadequate process for inspecting de-energized sections of the grid prior to re-energization. By 2023, Liberty plans to have an existing process for accurately inspecting de-energized sections of the grid prior to re-energization, augmented with sensors and aerial tools. • **32. Ignition prevention and suppression:** Liberty's survey responses project growth in this capability. Currently, Liberty has no policies governing crew's roles in suppressing ignition. By 2023, Liberty plans to have explicit policies about the role of crews (including contractors and subcontractors) at the site of ignition.
G. Data Governance Median automated maturity levels: 2020: 0.5 2023: 4	• Liberty plans to increase its maturity level by 2023 in four of four capabilities. Specifically, by capability: • **33. Data collection and curation**: Liberty's survey responses project growth in this capability. Currently, Liberty does not have a centralized database of situational, operational, and risk data. By 2023, Liberty plans to have a centralized database of situational, operational, and risk data that can be used to run advanced analytics to inform decision making and can ingest / share data in real-time with a variety of stakeholders. • **34. Data transparency and analytics:** Liberty's survey responses project growth in this capability. Currently, Liberty does not have a single document cataloguing all fire-related data, algorithms, analyses, and data processes. By 2023, Liberty plans to have this document, which will include an explanation of

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020 2022 WMP period
	sources, cleaning processes, and sensitivities for each type of analyses, as well as the capability to share across at least three levels of permissions. • **35. Near-miss tracking:** Liberty's survey responses project growth in this capability. Currently, Liberty is not able to simulate wildfire potential given an ignition with certain characteristics based on near miss data. By 2023, Liberty plans to be able to simulate wildfire potential given an ignition with certain characteristics based on near miss data and plans to use data from near misses to change grid operation protocols in real time. • **36. Data sharing with research community:** Liberty's survey responses project growth in this capability. Currently, Liberty does not participate in collaborative research or promote best practices based on research. By 2023, Liberty plans to participate in collaborative research addressing utility ignited wildfires and risk reduction initiatives and plans to promote best practices based on latest research.
H. Resource allocation methodology Median automated maturity levels: 2020: 0 2023: 2	• Liberty plans to increase its maturity level by 2023 in six of six capabilities. Specifically, by capability: • **37. Scenario analysis across different risk levels**: Liberty's survey responses project growth in this capability. Currently, Liberty does not project proposed initiatives or cost across different levels of scenarios. By 2023, Liberty plans to provide risk reduction and cost estimates for its accurate high- and low-risk reduction scenarios, in addition to its proposed scenario. • **38. Presentation of relative risk spend efficiency for portfolio of initiatives:** Liberty's survey responses project growth in this capability. Currently, Liberty does not have accurate qualitative rankings for its initiatives by risk spend initiative. By 2023, Liberty plans to present accurate qualitative rankings for its initiatives by RSE, including figures for present value cost, risk reduction, and an explanation of each investment. • **39. Process for determining risk spend efficiency of vegetation management initiatives:** Liberty's survey responses project growth in this capability. Currently, Liberty does not understand cost and effectiveness associated with producing a reliable RSE estimate of commonly deployed vegetation management initiatives. By 2023, Liberty plans to include most vegetation management initiatives in its evaluation process and to estimate RSEs vegetation management initiatives with circuit-level granularity. • **40. Process for determining risk spend efficiency of system hardening initiatives:** Liberty's survey responses project growth in this capability. Currently, Liberty does not understand cost and effectiveness associated with producing a reliable RSE estimate of commonly deployed grid hardening initiatives. By 2023, Liberty plans to include most commercially available grid hardening initiatives in the RSE analysis, and to have an accurate quantitative understanding of cost and effectiveness to produce a reliable RSE. • **41. Portfolio-wide initiative allocation methodology:** Liberty's survey responses project growth in this capability. Currently, Liberty does not base capital allocation on RSE. By 2023, Liberty plans to consider accurate RSEs for all initiatives when determining capital allocation within categories.

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020 2022 WMP period
	• **42. Portfolio-wide innovation in new wildfire initiatives:** Liberty's survey responses project growth in this capability. Currently Liberty has no program in place to develop and evaluate the efficacy or RSE of new wildfire initiatives. By 2023, Liberty plans to use pilots and measure direct reduction in ignition events and near misses to evaluate the efficacy of new wildfire initiatives, and to use total cost of ownership to develop and evaluate the RSE of new wildfire initiatives.
I. Emergency planning and preparedness Median automated maturity levels: 2020: 0 2023: 1	• Liberty plans to increase its maturity level by 2023 in three of five capabilities. Specifically, by capability: • **43. Wildfire plan integrated with overall disaster/emergency plan**: Liberty's survey responses project no growth in this capability but do indicate growth in two of the five relevant questions. Currently, Liberty does not audit the viability and execution of its wildfire plans, and its wildfire plan is not integrated with plans of other relevant stakeholders. By 2023, Liberty plans to run drills to audit the viability and execution of its wildfire plans and to work with relevant stakeholders to integrate its wildfire plans with its. • **44. Plan to restore service after wildfire related outages:** Liberty's survey responses project growth in this capability. Currently, there are no detailed and actionable procedures in place to restore service after a wildfire related outage. In 2023, these procedures will be in place to restore service after a wildfire related outage. • **45. Emergency community engagement during and after wildfire:** Liberty's survey responses project growth in this capability. Currently >95% of affected customers and >99% of affected medical baseline customers receive available details during a wildfire. By 2023, Liberty plans for >98% of affected customers and >99.0% of affected medical baseline customers to receive available details during a wildfire • **46. Protocols in place to learn from wildfire events:** Liberty's survey responses project growth in this capability. Currently, there is no protocol in place to record the outcome of emergency events or incorporate learnings into the emergency plan. By 2023, Liberty plans to have such a protocol in place and to have dry runs to test plans updated based on learning. • **47. Processes for continuous improvement after wildfire and PSPS:** Liberty's survey responses project no growth in this capability and do not indicate growth in any of the nine relevant questions. Liberty conducts an evaluation / debrief after a wildfire but does not make feedback or recommendations widely available to the public.
J. Stakeholder cooperation and community engagement	• Liberty plans to increase its maturity level by 2023 in three of five capabilities. Specifically, by capability: • **48. Cooperation and best practice sharing with other utilities**: Liberty's survey responses project growth in this capability. Currently, Liberty does not actively work to identify best practices from other utilities through a clearly defined process and does not seek to share best practices / lessons learned in a consistent format. By 2023, Liberty plans to use a defined process and format work to identify best practices from other California utilities and to share best practices / lessons learned.

Maturity Model Category	Summary of Maturity Assessment Focused on areas where utility plans to grow over the 2020 2022 WMP period
Median automated maturity levels: 2020: 0 2023: 2	• **49**. **Engagement with communities on utility wildfire mitigation initiatives:** Liberty's survey responses project no growth in this capability but do indicate growth in two of the six relevant questions. Currently, Liberty does not have a clear and actionable plan to develop or maintain a collaborative relationship with local communities. By 2023, Liberty plans to have a plan to develop and maintain a collaborative relationship with local communities. • **50. Engagement with LEP[1] and AFN[2] populations:** Liberty's survey responses project growth in this capability. Currently, Liberty does not provide a plan to partner with organizations representing LEP[1] and AFN[2] communities. By 2023, Liberty plans to provide a plan to partner with LEP and AFN communities, and outline how partnerships with these communities will create pathways for implementing suggested activities that address the needs of these communities. • **51. Collaboration with emergency response agencies:** Liberty's survey responses project growth in this capability. Currently, Liberty does not cooperate with suppression agencies by notifying them of ignitions. By 2023, Liberty plans to do so. • **52. Collaboration on wildfire mitigation plan with stakeholders:** Liberty's survey responses project no growth in this capability but do indicate growth in two of the four relevant questions. Currently, Liberty shares fuel management plans with other stakeholders but does not fund local groups to support fuel management. By 2023, Liberty plans to share fuel management plans with other stakeholders, and coordinate fuel management activities to cooperate with other stakeholders state-wide to focus on high risk areas; Liberty also plans to fund local groups to support fuel management. 1. Limited English Proficiency 2. Access and Functional Needs

1.2 Liberty Utilities: 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. Wildfire risk from various weather scenarios can be reliably estimated based on weather and its impacts b. Scenarios are assessed by independent experts, and supported by historical data of incidents and near misses c. Climate scenario modeling is done with regional-level granularity d. Climate scenario modeling tool is fully automated e. Climate scenario tool also accounts for how weather effects failure modes and propagation f. Future risk estimates take into account generally higher wildfire risk across entire service territory due to changing climate	**a. Wildfire risk for various weather scenarios is planned to be reliably categorized by level of risk** b. Scenarios are planned to be assessed by independent experts, and to be supported by historical data of incidents and near misses **c. Climate scenario modeling is planned to be done with circuit-level granularity** d. Climate scenario modeling tool is planned to be fully automated e. Climate scenario tool is planned to account for how weather effects failure modes and propagation f. Future risk estimates are planned to take into account generally higher wildfire risk across entire service territory due to changing climate
	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 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. Tools and processes can reliably categorize the risk of ignition across the grid into at least two categories based on characteristics and condition of lines, equipment, surrounding vegetation, and localized patterns b. Ignition risk estimation tool is mostly (>=50%) automated c. Ignition risk estimation tool has regional granularity d. Ignition risk estimation is confirmed by experts and historical data e. Ignition risk estimation uses >60% or no quantified confidence interval	a. Tools and processes are planned to be able to reliably categorize the risk of ignition across the grid into at least two categories based on characteristics and condition of lines, equipment, surrounding vegetation, and localized weather patterns b. Ignition risk estimation tool is planned to be mostly (>=50%) automated c. Ignition risk estimation tool is planned to have regional granularity d. Ignition risk estimation is planned to be confirmed by experts and historical data e. Ignition risk estimation is planned to use >60% confidence interval
	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. No translation of ignition risk estimates to potential consequences for communities b. Consequence of ignition risk is estimated as a function of at least one of the following: potential fatalities, structures burned, or areas burned c. Ignition risk impact analysis is available for all seasons d. Ignition risk estimation process is partially (<=50%) automated e. Ignition risk estimation process is done with regional 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	**a. Consequence of ignition events is planned to be categorized as low or high risk to communities** b. Consequence of ignition risk is planned to be estimated as a function of at least one of the following: potential fatalities, 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 regional granularity f. Outputs of consequence estimation is planned to be independently assessed by experts g. Estimation of wildfire consequences plans to use level and conditions of vegetation and weather, including the vegetation specifics immediately surrounding the ignition site
	Criteria missing to reach a maturity level of 1 or more: • Partially automated tools to reliably categorize ignition events as high or low risk to communities	**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 categorically (e.g., High, Medium, Low) b. Estimation of wildfire and PSPS reduction impact is mostly (>=50%) automated c. Estimation of wildfire and PSPS reduction impact is done with regional granularity d. Ignition risk reduction assessment tool estimates are assessed with evidence and logical reasoning e. Estimation of wildfire and PSPS reduction impact accounts for existing hardware type and condition	a. Approach is planned to reliably estimate risk reduction potential of initiatives categorically (e.g., High, Medium, Low) 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 be done with regional granularity d. Ignition risk reduction assessment tool estimates are planned to be assessed with evidence and logical reasoning e. Estimation of wildfire and PSPS reduction impact plans to account for existing hardware type and condition
	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. No defined process for updating risk mapping algorithms b. Decision to update algorithms based on deviations is not automated c. Deviations from risk model to ignitions and propagations are not currently calculated d. Decisions to update algorithms are not currently evaluated e. Neither current/historic ignition and propagation data, nor near-miss data is used to decide whether to update algorithms	a. No plans for a defined process for updating risk mapping algorithms b. Decision to update algorithms based on deviations is not planned to be automated c. Deviations from risk model to ignitions and propagations are not planned to be calculated d. Decisions to update algorithms are not planned to be evaluated e. Neither current/historic ignition and propagation data, nor near-miss data is planned to be used to decide whether to update algorithms
	Criteria missing to reach a maturity level of 1 or more: • Risk mapping updated at least bi-annually • Decisions based on manually detected deviations of risk model to actual ignitions and wildfire propagation	**Criteria missing to reach a maturity level of 1 or more:** • Risk mapping updated at least bi-annually • Decisions based on manually detected deviations of risk model to actual ignitions and wildfire propagation

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			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. 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
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

1.2.2.2 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 b. Weather data collected at least four times per hour c. Weather data resolution is done with region-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 four times per hour c. Weather data resolution is planned to be done with region-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 independent weather forecasting ability sufficiently accurate to fulfill PSPS requirements b. Accurate forecasts prepared less than two weeks in advance c. Weather forecasts have region-based granularity d. Forecast results are error checked against historical weather patterns e. Forecast process is fully automated	**a. Utility plans to have the ability to use a combination of accurate weather stations and external weather data to make accurate forecasts** b. Accurate forecasts are planned to be prepared less than two weeks in advance c. Weather forecasts are planned to have region-based granularity d. Forecast results are planned to be error checked against historical weather patterns e. Forecast process is planned to be fully automated
	Criteria missing to reach a maturity level of 1 or more: • Weather forecasting ability sufficiently accurate to fulfill PSPS requirements at circuit level	**Criteria missing to reach a maturity level of 1 or more:** • Weather forecasting ability sufficiently accurate to fulfill PSPS requirements at circuit level

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 b. Utility uses mostly manual processes for error checking weather stations with external data sources c. Weather data is used to create a single visual configurable live map that can be used to help make decisions	a. Utility plans to use a combination of accurate weather stations and external weather data b. Utility plans to use a mostly manual processes for error checking weather stations with external data sources **c.** Weather data is planned to be used to create a single visual 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 do not exist b. Well-defined equipment for detecting ignitions along grid, including remote detection equipment including cameras 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 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: • Well-defined procedures and equipment for detecting ignitions along grid	**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			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. Plan prioritizes risk reduction initiatives based on local geography and conditions within only HFTD areas	a. Liberty plans to prioritize risk reduction initiatives based on local geography and conditions within only HFTD areas
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

1.2.3.2 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 3 2 1 0	a. Grid topology meets minimum G095 requirements and loading standards in HFTD areas b. Utility does not provide 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 have been made across the entire service area to incorporate the latest asset management strategies and new technologies into grid topology	a. Grid topology is planned to meet minimum G095 requirements and loading standards in HFTD areas **b. Utility plans to provide micro grids or islanding where traditional grid infrastructure is impracticable and wildfire risk is high** c. Routing of new portions of the grid plans to take wildfire risk into account d. Liberty plans to make efforts across the entire service area to incorporate the latest asset management strategies and new technologies into grid topology
	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 many single points of failure 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 d. Utility does not consider egress point in its grid topology	a. Utility's transmission architecture is planned to have many single points of failure b. Utility's distribution architecture is planned to have (n-1) redundancy covering at least 50% of customers in HFTD c. Utility's distribution architecture is planned to be sectionalized to have switches in HFTD areas to individually isolate circuits **d.** Utility is not planned to consider egress point in its grid topology
	Criteria missing to reach a maturity level of 1 or more: • Grid architecture include (n-1) redundancy for transmission circuits subject to PSPS	**Criteria missing to reach a maturity level of 1 or more:** • Grid architecture includes (n-1) redundancy for transmission circuits subject to PSPS

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 no clear understanding of the relative risk spend efficiency of hardening initiatives b. Estimates can be prepared with asset-based 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 combinations of various initiatives	**a. Utility plans to have an accurate understanding of the relative cost and effectiveness of different initiatives** b. Estimates are planned to be prepared with asset-based granularity c. Estimates are planned to be updated annually or more frequently d. Utility plans to have all grid hardening initiatives included within its evaluation e. Utility does not plan to evaluate risk reduction synergies from combinations of various initiatives
	Criteria missing to reach a maturity level of 1 or more: • Utility has accurate relative understanding of • Cost • And feasibility of producing • A reliable risk spend efficiency estimate of grid hardening 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

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. No established program for evaluating the risk spend efficiency of new grid hardening initiatives b. Results of pilot and commercial deployments, including project performance, project cost, geography, climate, vegetation, etc. are shared with a limited set of partners c. Performance of new initiatives is not independently audited	**a. New grid hardening initiatives are evaluated based on installation into grid and measurement of direct reduction in ignition events** **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 not planned to be independently audited
	Criteria missing to reach a maturity level of 1 or more: • New initiatives developed and evaluated based on installation of hardening initiatives into grid • New initiatives developed and evaluated by measuring direct reduction in ignition events	**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 no service territory-wide inventory of electric lines and equipment including their state of ware or disrepair b. Condition assessment is never updated c. No system or approach is in place to detect or respond to malfunctions likely to cause ignition in HFTD areas d. Inventory is kept at the span level	**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** **b. Condition assessment is planned to be updated annually** **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 planned to be kept with asset level granularity**
	Criteria missing to reach a maturity level of 1 or more: • Inventory database is updated within 90 days of equipment inventory or conditions being collected • Inventory includes equipment that may contribute to wildfire risk • Inventory includes equipment age, state of wear, and expected lifecycle	**Criteria missing to reach a maturity level of 1 or more:** • Inventory database is updated within 90 days of equipment inventory or conditions being collected

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 consistent with minimum regulatory requirements b. Patrol inspections are based on annual or periodic schedules c. At least annually updated or verified static maps of equipment and environment are the inputs for scheduling patrol inspections d. Detailed inspections are consistent with minimum regulatory requirements 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 consistent with minimum regulatory requirements h. Other inspections are based on annual or periodic schedules i. At least annually updated or verified static maps of equipment and environment are inputs for scheduling patrol inspections	**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 consistent with minimum regulatory requirements 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 consistent with minimum regulatory requirements **h. Other inspections are planned to be based on up-to-date static maps of equipment types and environment** 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 do not include all items required by statute and regulations b. Procedures and inspection checklists are determined based on statute and regulatory guidelines only c. Checklists, training, and procedures are customized with span level granularity	**a. Patrol, detailed, enhanced, and other inspection procedures and checklists are planned to include all items required by statute and regulations** **b. Procedures and inspection checklists determined are planned to be based on vegetation and equipment type, age, and condition** c. **Checklists, training, and procedures are planned to be customized with asset level granularity**
	Criteria missing to reach a maturity level of 1 or more: • Patrol, detailed, enhanced, and other inspection procedures and checklists include all items required by statute and regulations	**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 b. Service intervals are not set based on wildfire risk in relevant circuit or area or real-time monitoring from sensors c. Maintenance and repair procedures do not take wildfire risk, performance history, or past operating conditions into account	**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 circuit** **c. Maintenance and repair procedures take only wildfire risk 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. There is a lack of controls for auditing contractor work completed, including inspections, for employees or subcontractors b. Contractors follow the same processes and standards as utility's own employees c. QA/QC information is never used to identify deficiencies in quality of work performance and inspections performance d. There is a lack of effective remediation for ineffective inspections or low-quality work e. Workforce management software tools are not 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** 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: • Established and demonstrably functioning post construction inspections of employee and contractor work • Established and demonstrably functioning follow-up and correction process and documentation and audit process to manage and confirm work completed by employees or subcontractors • QA/QC information is used periodically to identify deficiencies in quality of work and 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

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 not independently verified by third party experts d. Inventory has span-based 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 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 span-based 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 consistent with minimum regulatory requirements b. Vegetation inspections are scheduled based on up-to-date static maps of predominant vegetation species and environments c. At least annually updated static maps of vegetation and environment 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 up-to-date static maps of predominant vegetation species and environments **c.** At least annually updated static maps of vegetation and environment are the planned inputs 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 statue and regulations, and include vegetation types typically responsible for ignitions and near misses b. Procedures and checklists are based on predictive modeling based on statute and regulatory guidelines c. Checklists, training, and procedures are customized across the service area	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 across the service area
	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 3 2 1 0	a. Utility meets 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. Neither species growth rates nor species limb failure rates are used to guide clearance around lines and equipment e. Community organizations are not engaged in setting local clearances and protocols f. Utility does not remove vegetation waste along its right of way across the entire grid g. Utility removes vegetation waste along the right of way on the same day as cutting h. Utility works with local landowners to provide a cost effective use for cutting vegetation i. 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 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. Neither ignition risk modeling nor propagation risk modeling is planned to be used to guide clearances around lines and equipment d. Neither species growth rates nor species limb failure rates are planned to be used to guide clearance around lines and equipment e. Community organizations are not planned to be engaged in setting local clearances and protocols f. Utility does not plan to remove vegetation waste along its right of way across the entire grid g. Utility plans to remove vegetation waste along the right of way on the same day as cutting 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: i. Utility removes vegetation along right of ways across entire grid	**Criteria missing to reach a maturity level of 1 or more:** i. Utility removes vegetation along right of ways across entire grid

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 3 2 1 0	a. Utility systematically removes vegetation outside of right of way b. Potential vegetation that may pose a threat identified based on the height of trees with potential to make contact with electric lines and equipment c. Vegetation is removed with cooperation from the community d. Utility does not remove vegetation waste outside its right of way across the entire grid e. Utility removes vegetation outside its right of within 1 week or less of cutting f. Utility works with local landowners to provide a cost effective use for cutting vegetation j. Utility does not work 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 b. Potential vegetation that may pose a threat identified is planned to be based on the height of trees with potential to make contact with electric lines and equipment c. Vegetation is planned to be removed with cooperation from the community d. Utility does not plan to remove vegetation waste outside its right of way across the entire grid e. Utility plans to remove vegetation outside its right of way within 1 week or less of 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**
	Criteria missing to reach a maturity level of 1 or more: • Utility removes some vegetation outside of right of way	**Criteria missing to reach a maturity level of 1 or more:** • Utility removes some vegetation outside of right of way

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. Lack of controls for auditing work completed, including inspections, for employees or subcontractors b. Contractors follow the same processes and standards as utility's own employees c. QA/QC information is used sporadically 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 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** 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: • Established and demonstrably functioning post vegetation management inspections of employee and contractor work • Established and demonstrably functioning follow-up and correction process and documentation, and audit process to manage and confirm work completed by subcontractor • QA/QC information is used periodically to identify deficiencies in quality of work 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

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		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. Utility increases sensitivity of risk reduction elements during high threat weather conditions b. No automated process is used 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 b. No automated process is planned to adjust sensitivity of grid elements and evaluate effectiveness c. Liberty plans to have a predetermined protocol driven by fire conditions for adjusting sensitivity of grid elements
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

1.2.6.2 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 does not use predictive modeling to estimate the expected life and make equipment maintenance, rebuild, or replacement decisions based on grid operating history d. Utility operates the grid above rated voltage and current load only in conditions that are unlikely to cause wildfire	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 does not plan to use predictive modeling to estimate the expected life and make equipment maintenance, rebuild, or replacement decisions based on grid operating history d. Utility plans to operate the grid above rated voltage and current load only in conditions that are unlikely to cause 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

1.2.6.3 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 events generally forecasted accurately with fewer than 25% of predictions being false positives b. PSPS events are communicated to >99% of affected customers and >99.9% of medical baseline customers in advance of PSPS action c. 1% or more of customers complain during PSPS events d. Website does not go down during PSPS events e. Average downtime per customer is more than 1 hour f. Specific resources are not provided to all affected customers to alleviate the impact of the power shutoff (e.g., providing backup generators, supplies, batteries, etc.)	a. PSPS events are planned to be generally forecasted accurately with fewer than 25% of predictions being false positives b. PSPS events are planned to be communicated to >99% of affected customers and >99.9% of medical baseline customers in advance of PSPS action c. 1% or more 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 more 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: • Fewer than 1 hour of average PSPS time per customer per year • Utility has developed resources to mitigate PSPS consequence, including providing water, phone charging, and other resources to all affected by PSPS	**Criteria missing to reach a maturity level of 1 or more:** • Fewer than 1 hour of average PSPS time per customer per year

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 less than 5% probability of any large scale PSPS events affecting more than 10,000 people to occur in the coming year; grid is in sufficiently low risk condition that PSPS events will not be required, and the only circuits which may require de-energization have sufficient redundancy that energy supply to customers will not be disrupted	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 planned condition of the grid, utility expects less than 5% probability of any large scale PSPS events affecting more than 10,000 people to occur in the coming year; grid is in sufficiently low risk condition that PSPS events will not be required, and the only circuits which may require de-energization have sufficient redundancy that energy supply to customers will not be disrupted
	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. Inadequate process for inspecting de-energized sections of the grid prior to re-energization b. Manual process, no automated at all, for inspecting de-energized sections of the grid prior to re-energization c. Average time it takes to re-energize grid from a PSPS event once weather has subsided to below de-energization threshold is longer than 24 hours d. Utility has no 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 manual process, not automated at all, for inspecting de-energized sections of the grid prior to re-energization c. Average time it takes to re-energize grid from a PSPS event once weather has subsided to below de-energization threshold is planned to be longer than 24 hours d. Utility has no probability estimates for ignitions after PSPS events across the grid
	Criteria missing to reach a maturity level of 1 or more: • Grid is returned to service within 24 hours after weather has returned to below utility's PSPS threshold	**Criteria missing to reach a maturity level of 1 or more:** • Grid is returned to service within 24 hours after weather has returned to below utility's PSPS threshold

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 no policies governing what crews' roles are in suppressing ignitions b. Training and communications tools are provided to immediately report ignitions caused by workers or in immediate vicinity of 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 not 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 ignitions caused by workers or in immediate vicinity of workers; in addition, suppression tools and training to suppress small ignitions caused by workers or in immediate vicinity of workers are provided** c. No Cal/OSHA reported injuries or fatalities are planned to occur in events where workers have encountered an ignition d. Utility does not plan 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: • Utility has explicit policies about the role of personnel at the site of 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

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 does not have a centralized database of situational, operational, and risk data b. Utility is not able to use advanced analytics on its centralized database of situational, operational, and risk data to 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 not 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 f. Utility does not share 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		
	Criteria missing to reach a maturity level of 1 or more: i. Utility has centralized repository of accurate situational, operational, and risk data	**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. Analyses, algorithms, and data processing are not documented d. There is no system capable of sharing data in real time across multiple levels of permissions e. Most relevant wildfire related data algorithms are not disclosed	**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, including sensitivities for each type of analysis and data** **d. Liberty 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 is planned to be disclosed publicly in WMP upon request**
	Criteria missing to reach a maturity level of 1 or more: • All wildfire-related data and algorithms used by utility are catalogued in a single document, • including an explanation of the sources, and assumptions made; and • 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	a. Utility tracks near miss data for all near misses with wildfire ignition potential b. Utility is not 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 not able to predict the probability of a near miss in causing an ignition based on a set of event characteristics e. Utility does not use 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**
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

1.2.7.4 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 3 2 1 0	a. Utility makes required data disclosures, but does not share data beyond what is required b. Utility does not participate in collaborative research c. Utility research does not address utility ignited wildfires or risk reduction initiatives d. Utility does not promote 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 participates in collaborative research** **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**
	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 does not project proposed initiatives or costs across different levels of scenarios b. Utility provides projections for each scenario with region-level granularity c. Utility does not include a long term (e.g., 6-10 year) risk estimate in its scenarios d. Utility does not provide 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, in addition to its proposed 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: • Utility provides at least an accurate high-risk reduction and a low risk reduction scenario	**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 does not have accurate qualitative rankings for its initiatives by risk spend efficiency b. Common commercial initiatives are captured in the ranking of risk spend efficiency c. Utility does not 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 does not provide an explanation of its investment in each particular initiative 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. Common commercial 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: • Utility provides accurate qualitative ranking of initiatives by risk spend efficiency • Utility includes figures for estimated cost and projected risk reduction impact of each initiative • Utility includes an explanation of its investment in each initiative	**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 relative understanding of cost and effectiveness to produce 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 never updated d. No 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 cost, including sensitivities and effectiveness to produce a reliable risk spend efficiency estimate of vegetation management initiatives **b. Risk spend efficiency estimates of vegetation management initiatives 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. Most vegetation management initiatives are planned to be included within its evaluation** **e. Utility plans to evaluate risk reduction synergies from combination of various initiatives**
	Criteria missing to reach a maturity level of 1 or more: • Utility understands cost and effectiveness to produce a reliable risk spend efficiency estimate of commonly deployed vegetation management 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

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 relative understanding of cost and effectiveness to produce 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 never updated d. No 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 cost, including sensitivities, and effectiveness to produce a reliable risk spend efficiency estimate of system hardening initiatives** b. Risk spend efficiency of system hardening initiatives are planned to be prepared with circuit-based granularity **c. Estimates of system hardening initiatives are planned to be updated annually or more frequently** **d. Most commercially available grid hardening initiatives are planned to be included in the utility risk spend efficiency analysis** **a. Utility plans to evaluate risk reduction effects from the combination of various initiatives**
	Criteria missing to reach a maturity level of 1 or more: • Utility understands cost and effectiveness to produce a reliable risk spend efficiency estimate of commonly deployed grid hardening 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

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 does not base capital allocation on RSE b. Utility takes into account average estimate of RSE by initiative category when generating RSE estimates c. Utility does not verify RSE estimates 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 within categories only (e.g. to choose the best vegetation management initiative)** **b. Utility plans to take into account specific information by initiative, including state of equipment and location where initiative will be implemented when generating RSE estimates** **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: • 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. No program in place to develop and evaluate the efficacy of new wildfire initiatives b. No program in place to develop and evaluate the risk spend efficiency of new wildfire initiatives c. Utility measures efficacy of new wildfire initiatives across entire territory d. Reviews of innovative initiatives are not audited by independent parties e. Utility does not share the findings of its evaluation of innovative initiatives with other utilities, academia, and the general public	**a. Utility plans to use pilots and to measure 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: • New initiatives developed and evaluated on piloting • New initiatives developed and evaluated on measuring direct reduction in ignition events	**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			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. Wildfire plan is not integrated with overall disaster and emergency plans b. Utility does not run 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 not integrated with disaster and emergency preparedness plans of other relevant stakeholders (e.g., CAL FIRE, Fire Safe Councils, etc.) e. Utility does not take a leading role in planning, coordinating, and integrating plans across stakeholders	a. Wildfire plan is not planned to be integrated with 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 does not plan 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: • Wildfire plan is a component of overall disaster and emergency preparedness plan • Utility runs drills to audit the viability and execution of plans	**Criteria missing to reach a maturity level of 1 or more:** • Wildfire plan is a component of overall disaster and emergency preparedness plan

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 3 2 1 0	a. Detailed and actionable procedures are not 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 circuit-level granularity d. Customized procedure to restore service is not based on topography, vegetation, and community needs e. There is not an inventory of high risk spend efficiency resources available for repairs f. Wildfire plan is not integrated with 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 circuit-level granularity d. Customized procedure to restore service is not planned to be based on topography, vegetation, and community needs e. There is not planned to be an inventory of high risk spend efficiency resources available for repairs f. Wildfire plan is not planned to be integrated with overall disaster and emergency plans
	Criteria missing to reach a maturity level of 1 or more: • Detailed and actionable procedures in place to restore service after a wildfire related outage	**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 3 2 1 0	a. Utility provides clear and substantially complete communication of available information relevant to affected customers b. >95% of customers receive complete details of available information c. >99% 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 / at a toll-free telephone number e. Utility engages with other emergency management agencies in an ad hoc manner during emergency situations f. Utility does not communicate or coordinate 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 **b. >98% 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 / at a toll-free telephone number e. Utility plans to engage with other emergency management agencies in an ad hoc manner during emergency situations f. Utility does not plan to communicate and coordinate resources to communities during emergencies (e.g., shelters, supplies, transportation, 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

1.2.9.4 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 3 2 1 0	a. There is not a protocol in place to record the outcome of emergency events or to clearly and actionably document learnings and potential process improvements b. There is not a defined process and staff responsible for incorporating learnings into emergency plan c. Liberty does not use "dry runs" to test plans updated based on learnings and improvements to confirm its effectiveness d. There is not a defined process to solicit input from a variety of other stakeholders or incorporate learnings from other stakeholders into the emergency plan	**a. Liberty 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. Liberty plans to have a defined process and staff responsible for incorporating learnings into emergency plan** **c. Liberty plans to have "dry runs" to test plans updated based on learnings and improvements to confirm its effectiveness** d. **Liberty 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**
	Criteria missing to reach a maturity level of 1 or more: • Protocol in place to record outcome of emergency events • Protocol in place to clearly and actionably document learnings and potential process improvements • Protocol includes a defined process and staff responsible for incorporating learnings into emergency plan	**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			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. Utility conducts an evaluation or debrief process after a wildfire b. Utility conducts either a customer survey or utilizes partners to disseminate requests for stakeholder engagement (but not both) 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 not made public f. Utility conducts proactive outreach to local agencies and organizations to solicit additional feedback on what can be improved g. Utility does not have a clear plan for post-event listening and incorporating lessons learned from all stakeholders h. Utility does not track the implementation of recommendations and report upon their impact i. Utility does not have a process to conduct reviews after wildfires in other territories of other utilities and states to identify and address areas of improvement	a. Utility plans to conduct an evaluation or debrief process after a wildfire b. Utility plans to conduct a customer survey or utilize partners to disseminate requests for stakeholder engagement (but not both) 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 not 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 does not plan to have a clear plan for post-event listening and incorporating lessons learned from all stakeholders h. Utility does not plan to track the implementation of recommendations and report upon their impact i. Utility does not plan to have a process to conduct reviews after wildfires in other territories of other utilities and states to identify and address areas of improvement
3				
2				
1				
0				
			Criteria missing to reach a maturity level of 1 or more: • Utility conducts a customer survey and utilizes partners to disseminate requests for engagement • Feedback and recommendations on potential improvements are made public	**Criteria missing to reach a maturity level of 1 or more:** • Utility conducts a customer survey and utilizes partners to disseminate requests for engagement • Feedback and recommendations on potential improvements are made public

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 does not actively work to identify best practices from other utilities through a clearly defined operational process b. Utility successfully adopts and implements best practices identified from other utilities c. Utility does not seek to share best practices and lessons learned in a consistent format d. Utility does not share best practices and lessons via a consistent and predictable set of venues / media e. Utility does not participate in annual benchmarking exercises with other utilities to find other areas for improvement f. Utility has not 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 California 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 does not plan 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 does not plan 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: • Utility has a clearly defined operational process in place • To exchange best practices with other California utilities	**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

1.2.10.2 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 3 2 1 0	a. Utility does not have a clear and actionable plan to develop or maintain a collaborative relationship with local communities b. There are 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. More than 5% of landowners complain about utility initiatives (e.g., vegetation management) e. Utility does not 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 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. Liberty plans to have communities in HFTD areas where meaningful resistance is expected in response to efforts to mitigate fire risk (e.g., vegetation clearance) c. Liberty plans to have less than 1% of landowners non-compliant with utility initiatives (e.g., vegetation management) d. Liberty plans to have more than 5% 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
	Criteria missing to reach a maturity level of 1 or more: • Utility has a clear and actionable plan to develop or maintain a collaborative relationship with local communities • Utility has complaints from fewer than 5% of landowners	**Criteria missing to reach a maturity level of 1 or more:** • Utility has a clear and actionable plan to develop or maintain a collaborative relationship with local communities • Utility has complaints from fewer than 5% of landowners

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 3 2 1 0	a. Utility does not provide a plan to partner with organizations representing Limited English Proficiency (LEP) and Access & Functional Needs (AFN) communities b. Utility cannot outline how partnerships with LEP and AFN communities create pathways for implementing suggested activities to address the needs of these communities c. Utility cannot 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 does not have 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 does not plan 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 does not plan to have a specific annually-updated action plan to further reduce wildfires and PSPS risk to LEP & AFN communities
	Criteria missing to reach a maturity level of 1 or more: • Utility has a plan for partnering with organizations representing LEP and AFN communities • Utility is able to provide information about the nature of these partnerships	**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 does not cooperate with suppression agencies by notifying them of ignitions b. Utility is cooperating with suppression agencies throughout utility service areas c. Utility does not accurately predict and communicate the forecasted fire propagation path using available analytics resources and weather data d. Utility does not communicate 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 does not plan to be able to accurately predict and communicate the forecasted fire propagation path using available analytics resources and weather data d. Utility does not plan to be able to communicate fire paths to the community as requested e. Utility plans to assist suppression crews logistically where possible
	Criteria missing to reach a maturity level of 1 or more: • Utility cooperates with suppression agencies by calling in ignitions detected along length of grid	**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 throughout the service area b. Utility shares fuel management plans with other stakeholders, and works with other stakeholders conducting fuel management concurrently c. Utility does not cultivate a native vegetative ecosystem across territory that is consistent with lower fire risk d. Utility does not fund local groups (e.g., fire safe councils) to support fuel management	a. Utility 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 does not plan 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 Liberty Utilities: 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 Liberty'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)