

## PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE  
SAN FRANCISCO, CA 94102-3298



May 7, 2020

Agenda ID#: 18405

**TO: STAKEHOLDERS TO THE 2020 WILDFIRE MITIGATION PLANS**  
**Service List(s): R.18-10-007**

Enclosed is Draft Guidance Resolution WSD-002, which presents the Wildfire Safety Division's (WSD) guidance on the evaluation of the electrical corporations' 2020 Wildfire Mitigation Plans (WMPs). In addition to Draft Resolution WSD-002, the WSD presents seven additional Draft Resolutions, sequentially ordered as Draft Resolutions WSD-003 - WSD-009. These resolutions address the individual 2020 WMPs of Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas and Electric Company, Liberty Utilities, PacifiCorp, Bear Valley Electric Service, and, together, Trans Bay Cable, LLC, and Horizon West Transmission, LLC. The seven Draft Resolutions, along with the associated Action Statements and Draft Guidance Resolution WSD-002, represent the totality of WSD's evaluation of the 2020 WMPs. The Draft Guidance Resolution is presented to the Commission for ratification.

Pursuant to Rule 14.5 of the Commission's Rules of Practice and Procedure, stakeholders may submit comments on the Draft Guidance Resolution and Draft Resolutions WSD-002 - WSD-009. The WSD will accept one set of comments per stakeholder that collectively addresses the Draft Guidance Resolution and the individual electrical corporation Draft Resolutions WSD-002 - WSD-009.

Comments shall be limited to twenty (20) pages in length and should list the recommended changes to the Draft Resolutions. Comments shall focus on factual, legal or technical errors in the proposed Draft Resolutions.

Comments must be received by the Wildfire Safety Division by May 27, 2020. Comments should be submitted to the following email address: [wildfiresafetydivision@cpuc.ca.gov](mailto:wildfiresafetydivision@cpuc.ca.gov). The WSD will consider comments on the Draft Resolutions when finalizing its Action Statements for the WMPs.

Stakeholders submitting comments on the Draft Guidance Resolution must also serve their comments on the service list of R.18-10-007. Comments that are not

served on the service list of R.18-10-007 may not be considered. The WSD will post all comments received on the following website:

[www.cpuc.ca.gov/wildfiremitigationplans](http://www.cpuc.ca.gov/wildfiremitigationplans).

Replies to comments will not be accepted nor considered if submitted.

Draft Guidance Resolution WSD-002 will appear on the agenda at the next Commission meeting, which is at least 30 days after the date of this letter. The Commission may vote to ratify WSD's Draft Guidance Resolution at that time or it may postpone a vote until a later meeting.

Sincerely,

/s/ CAROLINE THOMAS JACOBS

Caroline Thomas Jacobs  
Director, Wildfire Safety Division

CTJ:gp2

Attachment

**PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA**

Resolution WSD-002  
Wildfire Safety Division  
[Date]

**R E S O L U T I O N**

RESOLUTION WSD-002 Guidance Resolution on 2020 Wildfire Mitigation Plans Pursuant to Public Utilities Code Section 8386.

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This Resolution gives overall guidance on the 2020 Wildfire Mitigation Plans (WMPs) submitted by the electrical corporations the Commission regulates. This Guidance Resolution is accompanied by individual Resolutions addressing each electrical corporation's WMP.

The Commission's most important responsibility is ensuring that its regulations keep Californians safe. Starting in 2007 with catastrophic wildfires in the San Diego area, the equipment of large electric utilities the Commission regulates has been implicated in the most devastating wildfires in our state's history. California's Legislature enacted several legislative measures requiring electrical corporations to submit, and the WSD to review, approve or otherwise act on WMPs designed to reduce the risk of utility-caused catastrophic wildfire. Key among the legislative measures are Senate Bill 901 (2018), Assembly Bill 1054 (2019), and Assembly Bill 111, discussed in detail below.

Along with this Resolution, which imposes requirements on all electrical corporations named below, the WSD is issuing separate Resolutions addressing the individual WMPs of Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, PacifiCorp, Liberty Utilities, Bear Valley Electric Service, and a single Resolution on the WMPs of independent transmission owners Trans Bay Cable, LLC and Horizon West Transmission, LLC. In conducting this evaluation, the

WSD considers and incorporates input from the Wildfire Safety Advisory Board, the public and other stakeholders.

Electrical infrastructure and equipment pose ongoing risks of starting wildfires due to the presence of electric current. There are three elements required to start a fire: fuel (such as dry vegetation), oxygen, and an ignition source (heat). A spark from electrical infrastructure and equipment can provide the ignition point from which a wildfire can spread and cause catastrophic harm to life, property, and the environment.

WMPs contain an electrical corporation's detailed plans to reduce the risk that equipment will ignite a wildfire. Electrical corporations are also required to demonstrate, through evaluation of a wildfire mitigation measure's "risk-spend efficiency," that California electric ratepayers' funds are only being spent on mitigation measures that are effective in reducing utility-caused wildfire risk.

Generally speaking, the key and most costly aspects of the individual WMPs consist of vegetation management; system hardening, such as widespread electric line replacement with covered conductors designed to lower wildfire ignition; new inspection programs; and "situational awareness" technology, such as weather stations, high definition cameras, and use of computer modeling, weather and wind data and machine learning to predict where wildfires are most likely to strike. In addition, de-energization of power lines, also called Public Safety Power Shutoff (PSPS), while potentially useful in the mitigation of wildfires, results in significant hardship and cost to utility customers. Individual WMP Resolutions focus most substantively on these issues and address deficiencies of the plans.

#### PROPOSED OUTCOME:

- Provides overarching guidance binding electrical corporations with regard to their 2020 WMPs
- Discusses the maturity of the electrical corporations as compared to their peers and utilities in the United States and around the world
- Discusses upcoming 2021 wildfire guidelines and the process for updating metrics

- Addresses impact of Covid-19 on WMPs.

#### SAFETY CONSIDERATIONS:

- Mitigation of catastrophic wildfires in California is among the most important safety challenges the Commission-regulated electrical corporations face. WMPs list all an electrical corporation's proposed actions to help prevent catastrophic wildfire, so comprehensive WMPs are essential to safety.
- By implementing measures such as vegetation management, system hardening (such as insulating overhead lines and removing or upgrading equipment most likely to cause fire ignition), improved inspection and maintenance, situational awareness (cameras, weather stations, and use of data to predict areas of highest fire threat), improved community engagement and awareness, and other measures, utility-caused catastrophic wildfire risk should be reduced over time.
- Wildfire Safety Division and Commission substantive and procedural changes for 2020 should increase California's ability to mitigate catastrophic wildfire caused by electrical corporations.

#### ESTIMATED COST:

- Nothing in this Resolution should be construed as approval of the costs associated with the WMP mitigation efforts. As set forth in Public Utilities Code §8386(g), and confirmed by Decision (D.) 19-05-036,<sup>1</sup> The Commission will consider recovery of costs related to WMPs in the electrical corporations' General Rate Cases.

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<sup>1</sup> See D.19-05-036 beginning at p. 21.

## Table of Contents

Summary .....	1
1. Background .....	1
2. Notice.....	3
3. Wildfire Safety Advisory Board Recommendations (WSAB) .....	3
4. Public And Stakeholder Comment.....	5
5. Discussion.....	6
5.1. COVID-19 Impact On Wildfire Mitigation Plans .....	6
5.2. Wildfire Safety Division Wildfire Mitigation Plan Guidelines And Process Improvements .....	7
5.2.1. Maturity Model .....	8
5.2.2. Data Standardization.....	11
5.2.3. Performance Metrics.....	12
5.2.4. Geographic Information Systems (GIS) Data .....	13
5.3. Evaluation Of Individual Electrical Corporations' WMPs .....	14
5.3.1. Structure Of Individual Electrical Corporation WMPs .....	14
5.3.2. Evaluation Of Electrical Corporations' WMPs .....	14
5.4. Common Deficiencies And Conditions Across 2020 WMPs.....	16
5.4.1. Analysis To Determine Most Effective Ways Of Mitigating Catastrophic Wildfire.....	17
5.4.2. WMP Initiative Impacts On PSPS .....	19
5.4.3. Aggregation Of Initiatives .....	20
5.4.4. Prevalence Of Equivocating Language -Failure Of Commitment .....	23
5.4.5. Pilot Program Discussions.....	24
5.4.6. Data And Metrics .....	25
5.4.7. Addressing Personnel Shortages.....	27
5.4.8. Long-Term Planning.....	27
5.5. Compliance With 2019 WMP Ordering Paragraphs .....	28
5.6. WMP Off Ramps .....	28
5.7. Consultation With Cal Fire Has Occurred.....	29
5.8. 2021 Wildfire Mitigation Plan And Data Schedule .....	29

5.9.	2021 Wildfire Mitigation Plan Guidelines, Performance Metrics, And Maturity Model Updates And Wsd Transition To California Natural Resources Agency .....	30
5.9.1.	WMP Guidelines, Performance Metrics and Maturity Model.....	30
5.9.2.	WSD Move To California Natural Resources Agency .....	31
6.	Comments.....	31
	Findings .....	32
	Order .....	34
Appendix A – Deficiencies and Conditions		
Appendix B – Detailed Figures & Charts		

## **SUMMARY**

This Resolution gives overall guidance on the 2020 Wildfire Mitigation Plans (WMPs) submitted by the electrical corporations the Commission regulates. In addition, this Guidance Resolution provides an overview of the framework used in 2020 for WMP submissions, including the Wildfire Safety Division's (WSD) 2020 WMP Guidelines, Utility Wildfire Mitigation Maturity Model, data standardization efforts, and performance metrics. Following this summary is a discussion of the WMP evaluation process used by WSD, including an overview of the deficiency/condition framework used in the Resolutions addressing each electrical corporation's 2020 WMP.

The Guidance Resolution continues by discussing common deficiencies found across the electrical corporations' WMPs and the WSD's plans to bring WMPs into compliance with the 2020 WMP Guidelines. Finally, this Guidance Resolution provides a discussion of the post-WMP reporting and off-ramp processes, and introduces the 2021 WMP evaluation process, including updates to the 2021 WMP Guidelines and the WSD transition to the California Natural Resources Agency (CNRA).

## **1. BACKGROUND**

Catastrophic wildfires in 2017-19 led the California Legislature to pass Senate Bill (SB) 901 in 2018 and its successor Assembly Bill (AB) 1054 in 2019, as well as AB 111. SB 901 and AB 1054 contain detailed requirements for electrical corporations' WMPs and provide a 90-day review cycle of WMPs by the Commission. AB 111 establishes a new WSD within the Commission. The duties of the WSD are contained in Public Utilities (Pub. Util.) Code Section 326(a), including to oversee and assure electrical corporations' compliance with wildfire safety requirements and to develop and recommend to the Commission performance metrics to achieve maximum feasible wildfire risk reduction.

SB 901 required a formal Commission proceeding for WMP review, and to that end the Commission reviewed the 2019 WMPs in Rulemaking (R.) 18-10-007. The decisions addressing the 2019 WMPs also added additional requirements for the 2020 WMPs. After the Commission issued its WMP decisions on May 30, 2019,<sup>2</sup> the Legislature enacted AB 1054 and AB 111, which established the WSD. AB 1054 contains similar WMP requirements to SB 901 but allows WMPs of a three-year, rather than one-year duration. AB 1054 also requires the

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<sup>2</sup> Decisions (D.) 19-05-036, D.19-05-037, D.19-05-038, D.19-05-039, D.19-05-040 and D.19-05-041 (May 30, 2019).



WSD to review and approve, deny or approve with conditions the electrical corporations' WMPs, with Commission ratification to follow thereafter. Further, AB 1054 requires establishment of a Wildfire Safety Advisory Board (WSAB), with appointees from the California Governor and Legislature, to provide comment on the 2020 WMPs. AB 1054 specifically requires the WSAB to develop and make recommendations related to the metrics used to evaluate WMPs in 2021 and beyond.<sup>3</sup> The WSD requested the WSAB provide recommendations on the 2020 WMPs, and WSD considered the WSAB's recommendations as part of its 2020 WMP evaluation process.

Building on lessons learned from the WMP review process in 2019, WSD developed and required all electrical corporations to conform their WMPs to a set of new WMP Guidelines starting in 2020.<sup>4</sup> In a change from the Commission's 2019 process, the WMP Guidelines add requirements on detail, data, and other supporting information, as discussed in detail below. The WMP Guidelines are designed: 1) to increase standardization of information collected on electrical corporations' wildfire risk exposure; 2) to enable systematic and uniform review of information each electrical corporation submits; and 3) to move electrical corporations toward an effective long-term wildfire mitigation strategy, with systematic tracking of improvements over time.

The Commission adopted Resolution WSD-001 setting forth the process for WSD and Commission review of the 2020 WMPs. The resolution called for electrical corporations to submit their 2020 WMPs on February 7, 2020. Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas and Electric Company (SDG&E), PacifiCorp, Liberty Utilities, Bear Valley Electric Service, Trans Bay Cable, LLC and Horizon West Transmission submitted WMPs on that date.

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

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<sup>3</sup> Pub. Util. Code § 8386.3 (Wildfire Safety Division), § 326.1 (Wildfire Safety Advisory Board).

<sup>4</sup> A ruling issued on December 19, 2019 in proceeding R.18-10-007 described and attached all of the material electrical corporations were required to use in submitting their 2020 WMPs.

hardening, risk-spend efficiency, emerging technology, and reduction of the scale and scope of Public Safety Power Shutoff (PSPS) events. Again, stakeholder and public input was offered.<sup>5</sup>

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

## **2. NOTICE**

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

## **3. WILDFIRE SAFETY ADVISORY BOARD RECOMMENDATIONS (WSAB)**

The WSAB provided recommendations on the WMPs on April 15, 2020.<sup>6</sup> The WSD has considered the WSAB's recommendations, and this Resolution and the utility-specific Resolutions incorporate WSAB's input throughout.

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

WSAB, in its evaluation of WMPs, did not recommend requiring resubmittal of 2020 WMP documents; rather, WSAB's recommendations are intended to be

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<sup>5</sup> Presentations, agendas and other details of the workshops appear on the Commission's WMP homepage, located at [www.cpuc.ca.gov/wildfiremitigationplans](http://www.cpuc.ca.gov/wildfiremitigationplans).

<sup>6</sup> See [www.cpuc.ca.gov/wsab](http://www.cpuc.ca.gov/wsab) for a complete copy of the WSAB's recommendations to the WSD.

additive guidance to inform the WSD's evaluation of 2020 WMPs and future wildfire mitigation efforts. The WSAB acknowledges that some recommendations may overlap efforts in other ongoing Commission proceedings but anticipates that recommendations for the improvement of wildfire mitigation work from multiple sources will be brought together under a utility's WMP.

WSAB recommends WSD consider the following:

1. Whether the utilities have provided adequate information to track and document their outreach efforts regarding emergency preparedness, event protocols, and post-event learnings.
2. Whether the utilities have provided adequate information to demonstrate that they are forming closer partnerships with city and county governments. This includes providing specific protocols for communicating with local fire departments and ensuring that utilities include a qualified local government liaison when an Incident Management Team is assembled in advance of a potential PSPS event.
3. The accessibility of the utilities' advanced weather modeling and fire modeling information and whether additional information should be made publicly available.
4. Whether the utilities should be required to submit pilot program implementation plans to be assessed for reasonableness and cost.
5. The sufficiency of information provided about utility vegetation treatment approaches including: A) whether vegetation treatment practices in non-forested areas are actually increasing wildfire risk; B) whether the utilities have developed programs to increase fuel moisture retention; C) whether the plans justify targeting certain at-risk species based on specific characteristics; and D) whether the fuel treatment programs that go beyond the requirements in General Order (GO) 95 follow best practices or have been scientifically reviewed.
6. Whether the utilities are effectively analyzing damage and potential ignition events that occur during PSPS to determine the effectiveness of their wildfire mitigation measures.
7. Whether the utilities are hiring asset inspectors with qualifications that go beyond basic knowledge of GO 95 requirements and whether the utilities are developing robust training programs.

8. Developing a deeper understanding of how the utilities are prioritizing certain line segments for exclusion from PSPS events.
9. Whether the utilities have completed an analysis of the High Fire Threat District (HFTD) maps to identify segments of the grid that may be excluded from PSPS events due to minimal fire risk. Further, strategies such as increased segmentation or switching generation sources should be considered to exclude low-risk downstream lines from PSPS events.
10. Whether the utilities factor the risk and cost to customers that result from a PSPS event into their risk spend efficiency calculations.
11. Whether the utilities should be required to develop specific re-energization timeframe goals. The utilities' wildfire mitigation measures should be designed to prioritize the quick re-energization of lines after a PSPS event.

#### **4. PUBLIC AND STAKEHOLDER COMMENT**

Various stakeholders submitted comments to WSD on the 2020 WMPs. Organizations that traditionally act as parties or respondents in formal proceedings pursuant to the Commission's Rules of Practice and Procedure submitted comments, including many organizations that are parties to R.18-10-007. Organizations and entities that submitted comments, some of which are parties to R.18-10-007, are: California Environmental Justice Alliance, Kevin Collins, East Bay Municipal Utility District, Energy Producers and Users Coalition, Green Power Institute, Joint Local Governments, Mussey Grade Road Alliance, Orange County Fire Authority, Perimeter Solutions, Protect our Communities Foundation, Public Advocates Office, Santa Clara County, Al Stein, and The Utility Reform Network. In addition, a significant number of members of the public submitted input focusing mostly on PG&E's 2019 PSPS actions, vegetation management programs and other issues. PG&E, SCE, SDG&E, Liberty Utilities, PacifiCorp, and Bear Valley Electric Service submitted reply comments. Most comments focused on individual utility WMPs and are addressed within each utility-specific Resolution. To the extent comments were applicable generally to all WMPs, that input is reflected within this Resolution.

## 5. DISCUSSION

### 5.1. COVID-19 IMPACT ON WILDFIRE MITIGATION PLANS

On March 19, 2020, the Governor of California signed Executive Order N-33-20 (stay-at-home order) requiring Californians to heed the order of the California State Public Health Officer and the Director of the California Department of Public Health that all individuals living in California stay home or at their place of residence, except as needed to maintain continuity of operation of the federal critical infrastructure sectors, in order to address the public health emergency presented by the COVID-19 disease.<sup>7</sup>

As articulated in the March 27, 2020 joint letters of the WSD, CAL FIRE and the California Governor's Office of Emergency Services regarding essential wildfire and PSPS mitigation work during COVID-19 sent to each electrical corporation, electrical corporations are expected to continue to prioritize essential safety work. The WSD expects the electrical corporations to make every effort to keep WMP implementation progress on track, including necessary coordination with local jurisdictions. Such effort is essential to ensuring that electrical corporations are prepared for the upcoming and subsequent wildfire seasons, while complying with COVID-19 restrictions requiring residents to shelter-in-place, practice social distancing, and comply with other measures that California's public health officials may recommend or that Governor Newsom or other officials may require in response to the COVID-19 pandemic.

Furthermore, the WSD expects the electrical corporations to continue to make meaningful progress on PSPS mitigation goals, including continuing with sectionalization projects, local outreach and coordination, establishing customer resource centers, and microgrid projects. Electrical corporations are expected to limit planned outage work during this time to wildfire mitigation, PSPS reduction, projects that immediately impact reliability if delayed, and emergency/public safety outages. In addition, electrical corporations are expected to undertake any other critical work related to operating a safe and reliable grid and to mitigate wildfire and/or PSPS risk. WSD expects that electrical corporations are thoroughly incorporating COVID-19 orders, response activities, and other considerations into their PSPS operations and protocols and will follow orders issued by the Commission in R.18-12-005 or any other Commission action pertaining to PSPS.

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<sup>7</sup> Executive Order N-33-20. Available at: <https://covid19.ca.gov/img/Executive-Order-N-33-20.pdf>.

## **5.2. WILDFIRE SAFETY DIVISION WILDFIRE MITIGATION PLAN GUIDELINES AND PROCESS IMPROVEMENTS**

In adopting the electrical corporations' 2019 WMPs, the Commission made clear it expected the WMP process to evolve moving forward:

The WMP decisions the Commission issues in this proceeding are but one action the state and its regulated electrical corporations will take to mitigate the risk of catastrophic wildfire. This will be an annual process, and we expect continuous improvement as our actions here are an important element of the collective state efforts to mitigate risks of catastrophic wildfires. As such, the annual WMP process will be iterative, and will require reporting, monitoring, evaluation and updating to ensure the electrical corporations are targeting the greatest risk with effective programs. D.19-05-036 at 36.

To further the objectives of AB 1054 and D.19-05-036, the Commission and the WSD implemented substantial changes to the 2020 WMP process to further enhance the depth, comparability and quality of utility WMP submissions. On December 16, 2020, the Commission issued 2020 WMP Guidelines via Administrative Law Judge's (ALJ) ruling in R.18-10-007. The WMP Guidelines required electrical corporations to follow a specific template for their 2020 WMPs and complete a survey assessing their maturity as compared to peers and other electric utilities, with responses forming part of a "maturity model."<sup>8</sup>

The 2020 WMP Guidelines provided for a standardized submission template, inclusion of a glossary of terms to ensure clarity and consistency, and structured data tables to identify relevant data and provide a systemic means of organizing data in WMP submissions. Other innovations include the requirement for electrical corporations, beginning in their 2021 WMPs, to provide certain standard data prior to WMP submission, develop a standard set of metrics for assessing whether electrical corporations are effectively mitigating the risk of

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<sup>8</sup> Following the December 16, 2019 ALJ Ruling, several clarifications and updates to survey questions and copy edit errors in the scoring rubric were addressed. These changes are reflected in redlines to these documents and are available at: [www.cpuc.ca.gov/wildfiremitigationplans](http://www.cpuc.ca.gov/wildfiremitigationplans).

catastrophic wildfire, and submit wide-ranging geographic information system (GIS) files and data to support the reported information.

The 2020 WMP Guidelines structure 2020 WMP submissions into six sections, as follows:

- 1) Persons responsible for executing the plan
- 2) Metrics and underlying data
- 3) Baseline ignition probability and wildfire risk exposure
- 4) Inputs to the plan and directional vision for wildfire risk exposure,
- 5) Wildfire mitigation activity for each year of the 3-year plan term, including expected outcomes
- 6) Utility GIS attachments

Parties to R.18-10-007 were invited to comment on the 2020 WMP Guidelines on January 7, 2020; however, due to the compressed 90-day timeline under which WSD had to act upon 2020 WMPs to ensure new WMPs are in place before the 2020 wildfire season, the WSD was unable to incorporate party comments into the 2020 WMP Guidelines. The WSD will therefore incorporate comments into its 2021 WMP Guideline revision, as well as soliciting further stakeholder input for those guidelines.

#### **5.2.1. MATURITY MODEL**

One significant enhancement to the 2020 WMP process relates to a first-of-its-kind maturity model that provides a method to assess utility wildfire risk reduction capabilities and examine the relative maturity of individual wildfire mitigation programs. In keeping with its core value of accountability through transparency and to enhance its focus on safety, the WSD has developed the Utility Wildfire Mitigation Maturity Model (“Maturity Model” or “Model”) to use in the evaluation of electrical corporations’ current and projected activities, capabilities and plans to address the wildfire risk in their service territories across a broad range of categories. These categories include:

- 1) Risk assessment and mapping;
- 2) Situational awareness and forecasting;
- 3) Grid design and system hardening;
- 4) Asset management and inspections;

- 5) Vegetation management and inspections;
- 6) Grid operations and protocols;<sup>9</sup>
- 7) Data governance;
- 8) Resource allocation methodology;
- 9) Emergency planning and preparedness; and
- 10) Stakeholder cooperation and engagement.<sup>10</sup>

These 10 categories encompass a set of 52 unique capabilities that together form the basis of a robust utility wildfire mitigation program. The WSD assessed the maturity of each electrical corporation's ability to mitigate its wildfire risk by analyzing their responses to a detailed survey with over 200 questions pertaining to the 52 capabilities that build on the foregoing 10 elements and evaluating utility responses against the initiatives contained in each electrical corporation's WMP.<sup>11</sup> The results of this assessment enable the WSD to determine how "mature" the electrical corporation is with regard to the capability addressed in its wildfire mitigation program, and how much the electrical corporation plans to improve its efforts over the three-year plan period. In general, the maturity model assessment process outlines numerous elements that an electrical corporation must meet to reach a particular level of maturity, and the sophistication of requirements related to a capability typically increase in parallel to the increase in maturity level.

In order to determine "maturity" in any one capability, the WSD assigned levels to each aspect of the electrical corporations' wildfire mitigation efforts. Each capability was assigned a level, from 0 – 4 range, with 0 being the lowest and 4 the highest. The WSD calculated a maturity level, in accordance with the required elements to achieve each level, as outlined in the maturity model rubric.<sup>12</sup> The levels were calculated using an "all or nothing" binary approach. That is, levels are reported as whole numbers only. Thus, in order to reach a

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<sup>9</sup> PSPS plans, capabilities, and initiatives are addressed in this category.

<sup>10</sup> These 10 categories correlate to the categories of detailed wildfire mitigation programs contained in Section 5.3 of electrical corporation WMPs.

<sup>11</sup> Verified utility responses to the maturity model survey are available at: <https://www.cpuc.ca.gov/wildfiremitigationplans/>.

<sup>12</sup> The complete maturity model and supporting documents are available at: <https://www.cpuc.ca.gov/wildfiremitigationplans/>.



specific maturity level, an electrical corporation would have to meet 100 percent of the threshold requirements for that level, as detailed in the maturity model rubric. In general, the maturity model rubric outlines numerous elements that are required to be met to achieve a given level, and the sophistication of requirements to reach a level typically increases with each successively higher maturity level.

For example, to obtain a level of 1 in Capability 24 of the 52 total capabilities, titled “Vegetation grow-in mitigation,” the electrical corporation (or utility) must demonstrate the following: “[u]tility maintains vegetation around lines and equipment according to minimum statutory and regulatory clearances. Utility: i) removes vegetation waste along right of ways and ii) within 1 week of cutting vegetation across entire grid.”<sup>13</sup> Thus, in order to receive a maturity level of 1 for Capability 24, an electrical corporation would not only have to maintain minimum regulatory clearances around its overhead lines but also remove the vegetation waste along its right of ways within one week of conducting vegetation clearance work. If an electrical corporation meets only one of these requirements, then it would be assigned the next lowest level. In this example, a level of 0 would be assigned and the electrical corporation would not receive “partial credit” towards a level of 1.

Accordingly, the maturity model results require context and should not be interpreted as the final word on an electrical corporation’s wildfire mitigation capabilities without an understanding of this assessment process. Therefore, each electrical corporation’s maturity model results should be viewed as levels or thresholds – they are not absolute scores. As shown in the previous example, while the quantitative maturity levels generated from the model are useful in providing a standardized basis for comparison across utility wildfire mitigation programs, the levels themselves do not tell the whole story. Consequently, one must be cautious when assessing and comparing numerical maturity levels to ensure the full context of the maturity model rubric requirements for that capability are understood.

A review of the maturity model results reveals that certain electrical corporations are currently at the low end of the range for various capabilities. The WSD’s

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<sup>13</sup> The complete maturity model and supporting documents are available at: <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M322/K150/322150488.PDF>.

intent in providing clear review and evaluation of performance (including identifying weaknesses) is to drive electrical corporations to improve their wildfire mitigation programs. The WSD does not intend to use the maturity model to immediately penalize electrical corporations for poor performance, but the WSD expects improvement and advancements in maturity over time. The first maturity model assessment establishes a starting point for each electrical corporation. The WSD will use this baseline to gauge each electrical corporation's willingness and ability to become industry leaders in wildfire mitigation planning and response. The maturity model provides specific elements that the electrical corporation can add to its toolbox to improve its wildfire mitigation capabilities, which in turn will produce a higher level of maturity (*i.e.*, a more mature wildfire mitigation program) in the future.

Given that the maturity model is new, further refinement and calibration of the rubric requirements may be necessary. As noted, use of the maturity model in 2020 allows the WSD to establish a baseline in order to track improvement in wildfire mitigation programs over time. The WSD will study and assess the model used in 2020 to determine whether alternative approaches may better drive utility improvements or align with Commission and WSD objectives. To do so, the WSD will facilitate model improvement by identifying best practices, strengths and weaknesses across the utility landscape that the model should reflect, taking into account the best interests of ratepayers, other key stakeholders and the electrical corporations. Any enhancements to the model will be addressed in WSD's publication of 2021 WMP Guidelines. The WSD intends to work with the electrical corporations and other stakeholders to refine and update the maturity model in 2021 and future years.

A detailed summary of maturity model assessments and outputs are provided as appendices to the individual utility Resolutions being issued concurrently with this Guidance Resolution.

### **5.2.2. DATA STANDARDIZATION**

Another improvement over the 2019 WMP process includes standardization, structuring and expansion of WMP data collection and reporting. To ensure clarity and consistency among WMPs, the 2020 WMP Guidelines include a glossary of terms. Establishing consistent definitions for key terminology allows for better standardization across the WMP submissions and provides a clear reference and additional detail for interested stakeholders. In addition to

clarifying and defining terminology, the 2020 WMP Guidelines include 31 tables for filers to complete. The tables require electrical corporations to provide data in a consistent format, allowing for quicker review and comparison given the short three-month review and approval deadline imposed by California Public Utilities Code Section 8386.3(a). The WSD will continue to pursue improvements that enhance the WMP review and approval process.

### **5.2.3. PERFORMANCE METRICS**

To supplement the foregoing changes in data structure and standardization, the 2020 WMP Guidelines also require reporting of outcome and progress metrics to measure efficacy and track plan progress. In D.19-05-036, the Commission found that the effectiveness of wildfire mitigation activities contained in electrical corporations' WMPs could not be determined through the use of "program targets," e.g., number of miles of covered conductor installed or number of trees trimmed. Further, the Commission found that "program targets" did not meet the requirements of Public Utilities Code 8386 to establish metrics to evaluate WMP performance. To remedy this shortcoming in 2019 WMPs, for 2020, the WMP Guidelines require filers to group metrics and program targets as follows.

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

In addition to these metrics, the 2020 WMP Guidelines implement a set of parameters to normalize reported data across utility submissions for comparison purposes. Due to its direct linkage to utility wildfire risk, one normalizing parameter is geographic location – specifically, location of assets in the Commission's High Fire-Threat District (HFTD). This allows for concentrated

focus on locations within the state at elevated or extreme risk of catastrophic wildfire in the event of utility ignition. Another normalizing parameter is circuit mileage for various types of power lines (*i.e.*, overhead vs. underground). Normalizing over circuit mileage accounts for differences in size across different utilities. The final normalizing parameter used is Red Flag Warning (RFW) circuit mile days, a newly-created measure that examines the miles of utility grid subject to RFW each day over the year, and is intended to account for temporal and geographic variances in fire weather potential across different utility service territories.

A detailed summary and comparison of performance metrics, current state of utility service territories, and resource allocation across “peer utilities” is provided in Appendix B. In this context, peer utilities are grouped into large electrical corporations (PG&E, SCE, and SDG&E) and other filers (Liberty Utilities, PacifiCorp, Bear Valley Electric Service (collectively, small and multijurisdictional utilities, or SMJUs), and Horizon West Transmission and Trans Bay Cable, LLC (collectively independent transmission operators, or ITOs).

#### **5.2.4. GEOGRAPHIC INFORMATION SYSTEMS (GIS) DATA**

GIS data is used to spatially and visually evaluate information, produce custom maps, and conduct analysis that adds value for decision-makers, utility providers, and the public. The 2019 WMP reviews and the rapid emergence of widespread PSPS implementation in California revealed both the lack of electric utility GIS data available to California state agencies and the vital importance of having such data. Therefore, the 2020 WMP Guidelines included a list of GIS data to be submitted by each electrical corporation.

In response, electrical corporations submitted a large amount of useful GIS data that the Commission and the WSD had never received at such a scale. A significant portion of this data was posted on the electrical corporations’ public websites at the same time it was submitted to the Commission, thus providing interested stakeholders access to unprecedented amounts of utility GIS data.

Up until the submission of 2020 WMPs in February 2020, publicly available transmission line data was the only California electric utility GIS data widely available to the Commission. Utility GIS data is critical in enabling agencies to effectively regulate the safety of the electrical system and inform planning of wildfire mitigation initiatives, such as fire-safe fuel treatments and prescribed

burns. A wide range of electric utility GIS data also enables agencies to effectively respond to large damaging wildfires and other disasters and enhances efforts to assist the public with evacuation and recovery tied to such events.

The quantity and quality of data submitted in 2020 is a substantial improvement over the past. However, the electrical corporations still have significant room for improvement. To that end, a detailed discussion of the common deficiencies in the 2020 WMP data submissions is provided in Section 5.4.6, and related efforts by the WSD for further refinement of the 2021 WMP data strategy is provided in Section 5.9.1, below.

### **5.3. EVALUATION OF INDIVIDUAL ELECTRICAL CORPORATIONS' WMPs**

#### **5.3.1. STRUCTURE OF INDIVIDUAL ELECTRICAL CORPORATION WMPs**

In addition to this Guidance Resolution, the WSD issues six Resolutions addressing the WMPs of PG&E, SCE, SDG&E, Bear Valley Electric Service, Liberty Utilities and PacifiCorp. WSD issues one additional Resolution addressing the WMPs of both Trans Bay Cable, LLC and Horizon West Transmission. The Resolutions addressing individual electrical corporations' WMPs share a common format and are structured according to the five main sections of the 2020 WMP Guidelines, excluding GIS data: 1. Persons responsible for executing the plan, 2. Metrics and underlying data, 3. Baseline ignition probability and wildfire risk exposure, 4. Inputs to the plan and directional vision for wildfire risk exposure, 5. Wildfire mitigation activity for each year of the 3-year plan term, including expected outcomes. Following these five sections, individual Resolutions contain a section discussing maturity model results. The evaluation methodology, including the concept of "Deficiencies" with each WMP and associated "Conditions" that must be fulfilled as a component of approval, is discussed in the following section.

#### **5.3.2. EVALUATION OF ELECTRICAL CORPORATIONS' WMPs**

The changes made to the 2020 WMP Guidelines and process helped steer WSD's review and disposition of electrical corporations' 2020 WMPs. The standardization of terminology and data submissions through structured data tables allowed for greater clarity, transparency and comparability across utilities. The maturity model provided an objective means of establishing and understanding electrical corporations' current and planned advancement in key capabilities, allowing for assessment of electrical corporations' baseline maturity

and ambitiousness of their WMPs, as reflected through projected maturity growth.

WSD used electrical corporations' 2020 WMP submissions and subsequent updates, responses to WSD data requests, and responses to the maturity model survey questions in its assessment of 2020 WMPs. The WSD evaluated 2020 WMPs according to the following factors:

- i. Completeness: The WMP is complete and comprehensively responds to the WMP requirements;
- i. Technical feasibility and effectiveness: Initiatives proposed in the WMP are technically feasible and are effective in addressing the risks that exist in the utility's territory;
- i. Resource use efficiency: Initiatives are an efficient use of utility resources;
- i. Forward looking growth: The utility is targeting maturity growth.

Upon completion of this review, WSD then determined whether each utility's 2020 WMP should either be:

- 1) Approved without conditions (Full Approval)
- 2) Approved with conditions (Conditional Approval)
- 3) Denied (Denial)

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

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

Class A deficiencies are of the highest concern and require an electrical corporation to develop and submit to the WSD, within 45 days of Commission ratification of the WMP Resolutions, a remedial compliance plan (RCP) to resolve the identified deficiency. An RCP must present all missing information and/or

articulate the electrical corporation's plan, including proposed timeline, to bring the electrical corporation's WMP into compliance. RCPs shall be named "[Name]'s 2020 Wildfire Mitigation Plan Remedial Compliance Plan."

Class B deficiencies are of moderate concern and require reporting on a quarterly basis by the electrical corporation to provide missing data or update its progress in a quarterly report. Such information shall be submitted either one time in the first quarterly report or on an ongoing basis as specified by each condition. The quarterly reports shall be named "[Name]'s Quarterly Report on 2020 Wildfire Mitigation Plan for [period covered]." Each electrical corporation shall submit its initial quarterly report 90 days after the Commission ratifies the WSD Resolutions, and every three months thereafter. In some cases, individual Resolutions impose other additional reporting requirements, and the Resolutions contain relevant detail for those reports.

Finally, Class C deficiencies require the electrical corporation to submit additional detail and information or otherwise come into compliance in its 2021 annual WMP update. Each deficiency and corresponding condition are uniquely numbered for ease of use and tracking purposes.

Submission of all reports shall be by e-mail to the Director of the WSD at [WildfireSafetyDivision@cpuc.ca.gov](mailto:WildfireSafetyDivision@cpuc.ca.gov). The electrical corporations shall concurrently serve all reports on the Department of Forestry and Fire Protection at [Mike.Wilson@fire.ca.gov](mailto:Mike.Wilson@fire.ca.gov) and on the service list in R.18-10-007 consistent with the procedures set forth in Rules 1.9 and 1.10 of the Commission's Rules of Practice and Procedure.

A list of all deficiencies and conditions identified in an electrical corporation's WMP is attached to the resolution on that electrical corporation's WMP. Each electrical corporation must meet the listed conditions specific to its WMP in full in order for its WMP to be deemed in compliance with statute and WMP Guidelines.

#### **5.4. COMMON DEFICIENCIES AND CONDITIONS ACROSS 2020 WMPS**

Development and execution of WMPS are essential to reduce utility wildfire related risk. While individual Resolutions address each WMP in detail, noting where each WMP is strong and detailing specific deficiencies and conditions that bind the relevant electrical corporation, there were common areas of weakness across all WMPS.

The key areas of weakness across all WMPs are discussed below, including deficiencies and associated conditions. The deficiencies and associated conditions herein do not apply to Horizon West Transmission, LLC and Trans Bay Cable, LLC.

#### **5.4.1. ANALYSIS TO DETERMINE MOST EFFECTIVE WAYS OF MITIGATING CATASTROPHIC WILDFIRE**

The WMP Guidelines and statutory requirements require electrical corporations to prove that they are choosing mitigation measures that present the greatest utility-caused wildfire risk reduction at the least cost. Most WMPs, however, fall far short in this area. Key deficiencies are the following:

- Failure to analyze each WMP initiative to determine whether it is an effective use of resources;
- Lack of detail and analysis to explain how the chosen portfolio of WMP initiatives will achieve goals to reduce the scope, frequency and impact of PSPS events;
- Lack of detail and discussion of how electrical corporations use risk modeling efforts to support utility decision-making to prioritize WMP initiatives;
- Limited discussion of alternatives analysis for chosen WMP initiatives;
- Where risk analysis is present, failure to use Risk Spend Efficiency (RSE), which is the type of analysis already adopted by the Commission for use in the Risk Assessment and Management Phase (RAMP) of utility General Rate Cases (GRCs), including in the Safety Model Assessment Proceeding (S-MAP);
- Aggregation of initiatives into broader programs and reporting WMP required data at program levels instead of individually for each initiative; and
- Inconsistencies and gaps in data submissions.

*Deficiency (Guidance-1, Class B): Lack of RSE information.*

2020 WMP submissions contain sparse and sporadic detail regarding the RSE of WMP initiatives. RSE calculations are critical for determining whether utilities are effectively allocating resources to initiatives that provide the greatest risk reduction benefits per dollar spent, thus ensuring responsible use of ratepayer



funds. Although RSE concepts have been considered for several years through Commission GRCs, utilities still display unrefined and limited abilities to produce such information. Considering that utilities propose to spend billions of dollars on WMP initiatives, not having quantifiable information on how those initiatives reduce utility ignition risk relative to their cost severely limits the WSD's ability to evaluate the efficacy of such initiatives and each utility's portfolio of initiatives, as outlined in 2020 WMPs.

**Condition (Guidance-1, Class B):** In its first quarterly report, each electrical corporation shall provide the following:

- i) Its calculated reduction in ignition risk for each initiative in its 2020 WMP;
- ii) Its calculated reduction in wildfire consequence risk for each initiative in its 2020 WMP; and
- iii) The risk models used to calculate (i) and (ii) above.

**Deficiency (Guidance-2, Class B):** *Lack of alternatives analysis for chosen initiatives.*

2020 WMP submissions contain little to no detail regarding utilities' process for comparing potential WMP initiatives. While most WMP initiatives are generally assumed to reduce utility wildfire risk, there are typically several alternatives that can address specific drivers of utility ignitions and near misses. However, 2020 WMPs generally do not include any discussion of which alternatives were considered, how the utility evaluated the efficacy of each alternative, and how the utility ultimately decided upon the suite of initiatives presented in its 2020 WMP.

**Condition (Guidance-2, Class B):** In its first quarterly report, each electrical corporation shall provide the following:

- i) All alternatives considered for each grid hardening or vegetation management initiative in its 2020 WMP;
- ii) All tools, models, and other resources used to compare alternative initiatives;
- iii) How it quantified and determined the risk reduction benefits of each initiative; and
- iv) Why it chose to implement each initiative over alternative options.

***Deficiency (Guidance-3, Class A):*** Lack of risk modeling to inform decision-making.

Electrical corporations do not provide sufficient detail in their 2020 WMPs to demonstrate how they are leveraging risk models to target the highest risk portions of the grid. While most utilities indicate current progress and work on developing models to estimate risk across their service territories, there is a lack of focus on how these models can be used in practice to prioritize initiatives to address specific ignition drivers and geographies. Specifically, utilities fail to outline in detail how they determine where to prioritize to improve asset management or determine portions of circuits that would benefit the most from hardening and vegetation management.

By continuing to improve wildfire risk modeling and basing its wildfire mitigations on its wildfire risk modeling outputs, electrical corporations can potentially achieve a greater level of risk reduction with the same resources.

***Condition (Guidance-3, Class A):*** Each electrical corporation shall submit in its remedial correction plan (RCP) the following:

- i) How it intends to apply risk modeling and risk assessment techniques to each initiative in its WMP, with an emphasis on much more targeted use of asset management, vegetation management, grid hardening and PSPS based on wildfire risk modeling outputs;
- ii) Identify all wildfire risk analyses it currently performs (including probability and consequence modeling) to determine which mitigation is targeted to circuits and assets where initiatives will provide the greatest benefit to wildfire risk reduction;
- iii) A timeline to leverage its risk modeling outputs to prioritize and target initiatives and set PSPS thresholds, including at least asset management, grid operations, vegetation management, and system hardening initiatives;
- iv) How it intends to incorporate future improvements in risk modeling into initiative prioritization and targeting processes; and
- v) How it intends to adapt its approach based on learnings going forward.

#### **5.4.2. WMP INITIATIVE IMPACTS ON PSPS**

Across 2020 WMP submissions, utilities indicate goals of reducing the scope, frequency and duration of PSPS events but also indicate intentions of continuing to implement PSPS as a wildfire mitigation measure. Considering the rapid expansion of PSPS use as a wildfire mitigation measure, and the numerous

hardships, inconveniences and hazards created by vast implementation, it is concerning that 2020 WMPs provide minimal to no discussion of how the chosen portfolio of initiatives will allow the utility to achieve its goals for reducing PSPS impacts.

***Deficiency (Guidance-4, Class B): Lack of discussion on PSPS impacts.***

Across 2020 WMP submissions, utilities indicate goals of reducing the scope, frequency and duration of PSPS events but also indicate intentions of continuing to implement PSPS as a wildfire mitigation measure in the immediate future. Considering the rapid expansion of PSPS use as a wildfire mitigation measure, and the numerous hardships, inconveniences and hazards created by its vast implementation, it is concerning that 2020 WMPs provide no discussion of how the chosen portfolio of initiatives will allow the utility to achieve its goals for reducing PSPS impacts. Specifically, no 2020 WMPs discuss the relationship between various grid hardening, vegetation management, and asset management initiatives and the corresponding impacts on thresholds for initiating PSPS events.

***Condition (Guidance-4, Class B):*** In its first quarterly report, each electrical corporation shall detail whether and how each initiative in its WMP:

- i) Affects its threshold values for initiating PSPS events;
- ii) Is expected to reduce the frequency (i.e. number of events) of PSPS events;
- iii) Is expected to reduce the scope (i.e. number of customers impacted) of PSPS events;
- iv) Is expected to reduce the duration of PSPS events; and
- v) Supports its directional vision for necessity of PSPS, as outlined in Section 4.4 of its WMP.

#### **5.4.3. AGGREGATION OF INITIATIVES**

A common deficiency in 2020 WMPs relates to the practice of aggregating initiatives into broader programs and reporting of data and information at the program level, thus preventing the WSD from evaluating the efficacy of individual initiatives.

***Deficiency (Guidance-5, Class B): Aggregation of initiatives into programs.***

In their 2020 WMP submissions, electrical corporations often combine various initiatives into broader programs and report cost, risk and other related data at the program level. This aggregation of initiatives and bundled reporting creates several issues. First, because cost data is typically reported across programs and not individual initiatives, it is not possible for the WSD to evaluate the efficacy of each initiative. Second, when initiatives are bundled and reported together as programs, it prevents WSD from being able to assess which initiatives are effectively reducing utility wildfire risk. Consequently, this creates the challenge that ineffective elements of broad programs cannot be determined and future considerations of initiatives within programs can only be done collectively.

***Condition (Guidance-5, Class B):*** In its first quarterly report, each electrical corporation shall:

- i) Break out its programs outlined in section 5.3 into individual initiatives;
- ii) Report its spend on each individual initiative;
- iii) Describe the effectiveness of each initiative at reducing ignition probability or wildfire consequence;
- iv) List all data and metrics used to evaluate effectiveness described in (iii), including the threshold values used to differentiate between effective and ineffective initiatives; and
- v) Provide the information required for each initiative in section 5.3 of the Guidelines.

If an electrical corporation does not have the relevant data for each initiative, it shall: i) explain the difference between what it reports and what the WMP Guidelines require, ii) explain why it cannot meet the WMP Guidelines, and iii) develop a plan to obtain and share the relevant initiative information at the initiative level rather than the program level, including a timeline of when such information will be provided.

***Deficiency (Guidance-6, Class B): Failure to disaggregate WMP initiatives from standard operations.***

While WMPs are designed to outline and detail filer's plans and initiatives for mitigating wildfire risk, many existing programs also provide wildfire risk reduction benefits. For example, General Order (GO) 165 requires annual patrol

inspections and detailed inspections every five years for electrical infrastructure. These programs and initiatives are often referenced in 2020 WMPs as “supporting,” “routine,” “enabling,” “standard,” or “foundational” work. For these types of programs, in most cases, electrical corporations do not report cost or risk reduction data, as the work is considered part of their electric operations and it is indicated that this information is not tracked independently.

Several electrical corporations state that their programs for inspecting and maintaining crossarms, poles, transformers, transmission towers and similar infrastructure, which also reduce wildfire risk, are embedded within standard maintenance programs litigated in GRCs. Consequently, it is difficult to determine whether and how these programs incrementally impact wildfire risk reduction or if related WMP initiatives are redundant and unnecessary. While utilities may not have historically considered the costs and effectiveness of such programs and initiatives, given that numerous WMP initiatives have apparent overlap or potential redundancy, it is imperative that utilities provide such data to validate the need for and effectiveness of additional programs.

It is not clear how electrical corporations are tracking their WMP activities in memorandum accounts if they do not budget for them by type of initiative. The Commission will scrutinize electrical corporations’ memorandum accounts for WMP carefully, and if all costs are simply lumped together or included in general operations and maintenance accounts, electrical corporations risk failing to provide entitlement to cost recovery.

***Condition (Guidance-6, Class B):*** In its first quarterly report, each electrical corporation shall:

- i) Clearly identify each initiative in Section 5.3 of its WMP as “Standard Operations” or “Augmented Wildfire Operations;”
- ii) Report WMP required data for all Standard Operations and Augmented Wildfire Operations;
- iii) Confirm that it is budgeting and accounting for WMP activity of each initiative; and
- iv) Include a “ledger” of all subaccounts that show a breakdown by initiative.

**Deficiency (Guidance-7, Class B):** *Lack of detail on effectiveness of “enhanced” inspection programs.*

Utilities engage in numerous ‘enhanced’ inspection programs, but it is unclear if such ‘enhanced’ programs are incrementally effective over routine patrol and detailed inspections, particularly if patrol and detail inspections are scheduled based on risk rather than GO 95 minimums.

**Condition (Guidance-7, Class B):** In its first quarterly report, each electrical corporation shall detail:

- i) The incremental quantifiable risk identified by such ‘enhanced’ inspection programs;
- ii) Whether it addresses the findings uncovered by ‘enhanced’ programs differently than findings discovered through existing inspections; and
- iii) A detailed cost-benefit analysis of combining elements of such ‘enhanced’ inspections into existing inspection programs.

#### **5.4.4. PREVALENCE OF EQUIVOCATING LANGUAGE -FAILURE OF COMMITMENT**

A continuing issue from 2019 that persists in 2020 WMPs is the extensive use of non-committal equivocating language. The prevalent use of equivocating language results in sparse commitment from utilities for achieving the intended goal of WMPs – reducing the risk of catastrophic wildfire posed by electrical lines and equipment.

**Deficiency (Guidance-8, Class C):** *Prevalence of equivocating language – failure of commitment.*

While there have been many improvements and advancements reflected in 2020 WMPs, a key concern remains regarding discussion of WMP objectives and the prevalent use of “equivocating language” to avoid making measurable, quantifiable, and verifiable commitments. While electrical corporations make promises to quantifiably reduce PSPS impacts and the frequency of near misses and ignitions, other promises are far less specific. Terms such as, “track,” “assess,” “evaluate,” and “evolve” are repeated hundreds of times throughout the 2020 WMPs. Without sufficient details, none of these terms provide the WSD or the public with a measurable, quantifiable, and verifiable goal against which electrical corporations could be held.

**Condition (Guidance-8, Class C):** In its 2021 WMP update, each electrical corporation shall:

- i) Include objectives for each of its initiatives that are measurable, quantifiable, and verifiable by the WSD;
- ii) Provide targets and timelines for all strategies, plans, and approaches to wildfire mitigation that are measurable, quantifiable and verifiable by the WSD; and
- iii) Dispense with empty rhetoric and not use terms that are ambiguous, misleading, or otherwise have the result of diluting commitments. Continued use of equivocating language may result in denial of future WMPs.

#### **5.4.5. PILOT PROGRAM DISCUSSIONS**

During WMP workshops in February 2020 and throughout the WMPs, electrical corporations mentioned implementing numerous pilot programs to test and evaluate new, emerging and pre-commercial technology. A variety of these technologies show potential in reducing utility wildfire risk. In fact, during the WMP workshops in February 2020, a panel of utility experts discussing emerging technologies unanimously indicated that early/advance fault detection technologies show the most promise in reducing utility wildfire risk in the near-term. Although it is encouraging that utilities indicate they are engaging in pilot studies and evaluating different technologies, discussion and communication of those efforts lacks detail and specificity.

**Deficiency (Guidance-9, Class B):** *Insufficient discussion of pilot programs.*

Electrical corporations do not describe how they will evaluate and expand the use of successfully piloted technology or which piloted technology has proven ineffective. To ensure pilots that are successful result in expansion, if warranted and justified with quantitative data, electrical corporations must evaluate each pilot or demonstration and describe how it will expand use of successful pilots.

**Condition (Guidance-9, Class B):** In its quarterly report, each electrical corporation shall detail:

- i) All pilot programs or demonstrations identified in its WMP;
- ii) Status of the pilot, including where pilots have been initiated and whether the pilot is progressing toward broader adoption;

- iii) Results of the pilot, including quantitative performance metrics and quantitative risk reduction benefits; and
- iv) A proposal for how to expand use of the technology if it reduces ignition risk materially.

#### **5.4.6. DATA AND METRICS**

The 2019 WMP decisions made clear that electrical corporations had to demonstrate that their mitigation measures are effective in mitigating utility-caused wildfire risk. The WMP statute requires the use of metrics to demonstrate effectiveness, but the metrics must be meaningful. In this regard, the 2019 decisions and the 2020 WMP Guidelines stress that relevant metrics do not simply count the number of mitigations and assume effectiveness. Thus, for example, setting and achieving a goal of trimming a million trees or installing 1,000 circuit miles of covered conductor does not prove that the electrical corporation is actually reducing wildfire risk. Rather, to demonstrate the effectiveness of such measures, the electrical corporation must show a reduction in ignitions at times when winds are high, vegetation is dry, or its region is experiencing high heat or RFW events.

While the electrical corporations' submission of large amounts of GIS and other data marks a seminal evolution in data transparency and sharing, the 2020 WMP process has highlighted the need for additional refinement and improvement across all electrical corporation data submissions to ensure compatibility, completeness and usefulness. The WSD intends to address most areas for improvement in the 2021 WMP updates described in Section 9, including standardized file formats, more comprehensive metadata that define fields and better software compatibility for certain files.

Over the past several months, the WSD has been working on the development of an enterprise data strategy to better support WMP reviews and utility-caused wildfire risk reduction. Through lessons learned from the 2019 WMP process and those learned during the expanded data reporting efforts for 2020 WMPs, the WSD is creating a master data taxonomy and data schema. In other words, the WSD is determining how to name and format each type of data and designing a way of organizing the data so that it is consistent across electrical corporations. The master data taxonomy will serve as a central ledger of spatial and non-spatial data related to utility wildfire mitigation and WMPs. The data



schema will provide standardized guidelines to inform future WMP data submissions.

Finalization of these documents requires additional refinement through discussion with electrical corporations and other stakeholders, in addition to further study of existing datasets. The WSD expects to engage in these discussions and publish refinements through updated 2021 WMP Guidelines expected later this year. The WSD may ask certain stakeholders with expertise in data and data analysis to form a working group to ensure data are collected and updated in a way that facilitates efficient comparison and analysis.

***Deficiency (Guidance-10, Class B): Data issues – general.***

Although the availability of data, including GIS data, provides unprecedented insight into utility infrastructure and operations, inconsistencies and gaps in the data present a number of challenges and hurdles. As it relates to GIS data, electrical corporation submissions often had inconsistent file formats and naming conventions, contained little to no metadata, were incomplete or missing many data attributes and utilized varying schema. These deficiencies rendered cross-utility comparisons impossible without substantive, resource and time-consuming manipulation of the data. Additional data challenges included varying interpretations of WMP Guideline data requirements, leading to inconsistency of data submitted.

***Condition (Guidance-10, Class B):*** Electrical corporations shall ensure that all future data submissions to the WSD adhere to the forthcoming data taxonomy and schema currently being developed by the WSD. Additionally, each electrical corporation shall file a quarterly report providing that detail:

- i) Locations where grid hardening, vegetation management, and asset inspections were completed over the prior reporting period, clearly identifying each initiative and supported with GIS data;
- ii) The type of hardening, vegetation management and asset inspection work done, and the number of circuit miles covered, supported with GIS data;
- iii) The analysis that led it to target that specific area and hardening, vegetation management or asset inspection initiative; and
- iv) Hardening, vegetation management, and asset inspection work scheduled for the following reporting period, with the detail in (i) – (iii).

#### **5.4.7. ADDRESSING PERSONNEL SHORTAGES**

Electrical corporations express having experienced some level of difficulty finding sufficient numbers of experienced personnel, particularly in vegetation management. Electrical corporations typically describe a competitive environment that makes attracting talent difficult.

*Deficiency (Guidance-11, Class B): Lack of detail on plans to address personnel shortages.*

Electrical corporations do not explain in detail the range of activities that they are undertaking to recruit and train personnel to grow the overall pool of talent in areas of personnel shortage.

*Condition (Guidance-11, Class B):* In its first quarterly report, each electrical corporation shall detail:

- i) A listing and description of its programs for recruitment and training of personnel, including for vegetation management;
- ii) A description of its strategy for direct recruiting and indirect recruiting via contractors and subcontractors; and
- iii) Its metrics to track the effectiveness of its recruiting programs, including metrics to track the percentage of recruits that are newly trained, percentage from out of state, and the percentage that were working for another California utility immediately prior to being hired.

#### **5.4.8. LONG-TERM PLANNING**

All electrical corporations were required in section 5.1 of the 2020 WMP Guidelines to describe their organization-wide wildfire mitigation strategy within the next three years and within the next 10 years. Few provided detailed strategies with information that the WSD could use to fully understand the electrical corporation's long-term wildfire mitigation strategy.

*Deficiency (Guidance-12, Class B): Lack of detail on long-term planning.*

Electrical corporations do not provide sufficient detail regarding long-term wildfire mitigation plans and how the initiatives in their WMPs align with and support those long-term plans.

**Condition (Guidance-12, Class B):** In their first quarterly report, each electrical corporations shall detail:

- i) Its expected state of wildfire mitigation in 10 years, including 1) a description of wildfire mitigation capabilities in 10 years, 2) a description of its grid architecture, lines, and equipment;
- ii) A year-by-year timeline for reaching these goals;
- iii) A list of activities that will be required to achieve this end goal; and
- iv) A description of how the electrical corporation's three year WMP is a step on the way to this 10-year goal.

#### **5.5. COMPLIANCE WITH 2019 WMP ORDERING PARAGRAPHS**

On June 3, 2019, the Commission issued a series of six decisions approving electrical corporations' 2019 WMPs.<sup>14</sup> These decisions contained many ordering paragraphs (OPs) requiring action by electrical corporations in their 2020 WMP submissions. Many of these OPs were resolved through changes made to the WMP Guidelines and process and were thus automatically incorporated into the 2020 WMP submissions.

WSD has reviewed the 2020 WMPs submissions for compliance with 2019 OPs. It has determined that each 2019 OP has either been addressed in the electrical corporation's 2020 WMP or is the subject of conditions in this Guidance Resolution or the individual Resolutions being issued this year.

#### **5.6. WMP OFF RAMPS**

It is essential that there be a process for modifying, reducing, increasing, or ending mitigation measures that are not working or otherwise require modification. Therefore, electrical corporations named shall submit a letter to WSD entitled "Reports on Possible Off Ramps" describing any concerns about the effectiveness of any program in the WMP. The first such letter shall be submitted no later than 6 months from the effective date of this Resolution and the second one no later than 12 months after the effective date of this Resolution.

Submission of all off-ramp letters shall be by e-mail to the Director of the WSD at [WildfireSafetyDivision@cpuc.ca.gov](mailto:WildfireSafetyDivision@cpuc.ca.gov). The electrical corporations shall concurrently serve all reports on the Department of Forestry and Fire Protection

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<sup>14</sup> These included D.19-05-036, D.19-05-037, D.19-05-038, D.19-05-039, D.19-05-040, D.19-05-041.

at [Mike.Wilson@fire.ca.gov](mailto:Mike.Wilson@fire.ca.gov) and on the service list in R.18-10-007 consistent with the procedures set forth in Rules 1.9 and 1.10 of the Commission's Rules of Practice and Procedure

The letters shall clearly describe the concern, contain a specific proposal for action, including if applicable a recommendation to modify, reduce, increase, or end the specific mitigation identified, and shall include any expert or other authoritative information available on the efficacy of the mitigation.

Stakeholders may comment on these letters within fifteen days of submission following the submission instructions above but may not otherwise seek off ramps through this letter process. Attempts to increase program size or expense may require separate electrical corporation applications, at the discretion of WSD and/or the full Commission.

#### **5.7. CONSULTATION WITH CAL FIRE HAS OCCURRED**

Pub. Util. Code § 8386.3(a) requires WSD to consult with CAL FIRE in reviewing electrical corporations' 2020 WMPs. The Commission and CAL FIRE have a memorandum of understanding in place to facilitate this consultation (Pub. Util. Code § 8386.5). The Commission and WSD have met these requirements, but neither this Resolution nor the Resolutions on the individual WMPs purport to speak for CAL FIRE.

#### **5.8. 2021 WILDFIRE MITIGATION PLAN AND DATA SCHEDULE**

WSD is required by Pub. Util. Code § 8386(b) to 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 WSD 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.

Pursuant to the foregoing requirement, WSD has determined that all electrical corporations shall file an update to their 2020 WMPs in 2021. WSD will issue a schedule for such submission separately and may stagger the electrical corporations' submissions to give the WSD and stakeholders more time to review each update. As discussed below, WSD will also refine and update its WMP Guidelines and other supporting documents.

Trans Bay Cable, LLC and Horizon West Transmission are differently situated to the other electrical corporations, having minimal ignition risk due to their locations and footprints. As such, the WSD will issue separate guidance to Trans Bay Cable and Horizon West Transmission on the required contents of 2021 WMP updates. The WSD will also consider a more streamlined data and submission process for these companies in advance of their next comprehensive WMP filing in 2023.

In addition, all electrical corporations shall update the tables and data submitted with their 2020 WMPs (and any table or data required in this Resolution or the companion individual Resolutions) on a schedule that ensures the Commission and stakeholders have the updates 3 months before WMP updates are due. Based on these data submissions, WSD may issue data requests, identify deficiencies, and give feedback to the electrical corporations before they file their WMP updates so that the actual WMP updates are comprehensive and complete. Since WSD has only 90 days to review WMPs, this advance work is essential to a full review. WSD will issue a schedule for these submissions in the near future.

**5.9. 2021 WILDFIRE MITIGATION PLAN GUIDELINES, PERFORMANCE METRICS, AND MATURITY MODEL UPDATES AND WSD TRANSITION TO CALIFORNIA NATURAL RESOURCES AGENCY**

Several events will occur between now and July 2021 related to metrics, WMP Guidelines, the Maturity Model and ultimately the AB 1054-mandated move of WSD from a Division of this Commission to an Office of the California Natural Resources Agency (CNRA).

**5.9.1. WMP GUIDELINES, PERFORMANCE METRICS AND MATURITY MODEL**

As noted above, parties commented on January 7, 2020 on the 2020 WMP Guidelines issued with the December 16, 2019 ruling in R.18-10-007, but there was insufficient time to update the Guidelines before the February 7, 2020 WMP submission deadline. WSD will consider the input provided and its own lessons learned from this year's process and issue revised WMP Guidelines for 2021. The process may allow additional comment and workshops and will consider input from the WSAB as required by Public Utilities Code §8389(2)(b). As such, the WSD will issue updated Guidelines and Performance Metrics by October 31, 2020 for adoption and approval by the Commission by December 1, 2020, as required by Pub. Util. Code § 8389(3)(c-d).

In R.18-10-007, as noted above, the Commission directed the electrical corporations to use metrics that do not simply count trees trimmed or miles of covered conductor installed, but that measure the effectiveness of these actions in mitigating utility-caused wildfire. Several sets of comments and other filings on appropriate metrics were submitted in the formal proceeding, but the enactment of AB 1054 transfers these responsibilities to the WSD. As a result, the metric development process that began in R.18-10-007 will be superseded by a process run by the WSD. The WSD will issue additional guidance on the WMP Guideline and Performance Metrics update process later this year.

As the discussion of the maturity model earlier in this Resolution indicates, refinement of the model may be necessary. Along with updates to the WMP Guidelines, the WSD will issue updates to the maturity model according to the deadlines set forth above.

#### **5.9.2. WSD MOVE TO CALIFORNIA NATURAL RESOURCES AGENCY**

Public Utilities Code § 326(b) requires that, by July 1, 2021, the WSD will transition to the CNRA and become the Office of Energy Infrastructure Safety (OEIS). This transition will occur during the current three-year WMP cycle and therefore may alter some of the form of submissions or processes used by the WSD/OEIS to evaluate WMPs. The WSD will issue guidance as necessary to ensure electrical corporations and stakeholders are aware of any changes to the WMP submission, evaluation, reporting and compliance processes as a result of transition to CNRA and conversion to OEIS.

#### **6. COMMENTS**

Pub. Util. Code Section 311(g)(1) provides that resolutions must be served on all parties and subject to at least 30 days public review. However, given that this resolution is issued outside of a formal proceeding, interested stakeholders need not have party status in R.18-10-007 in order to submit comments on the resolution. Please note that comments are due 20 days from the publishing date of this resolution. Reply comments will not be accepted nor considered.

This draft resolution was served on the service list of R.18-10-007 and posted on the Commission's website, [www.cpuc.ca.gov/wildfiremitigationplans](http://www.cpuc.ca.gov/wildfiremitigationplans), and it will be placed on the Commission's agenda no earlier than 30 days from today.

The following stakeholders submitted comments on the Draft Resolution:

\_\_\_\_\_.

**FINDINGS**

1. On March 19, 2020, the Governor of California signed Executive Order N-33-20 requiring Californians to heed the order of the California State Public Health Officer and the Director of the California Department of Public Health that all individuals living in California stay home or at their place of residence, except as needed to maintain continuity of operation of the federal critical infrastructure sectors, in order to address the public health emergency presented by the COVID-19 disease.
2. There was inadequate time to incorporate party comments on the WMP Guidelines and supporting material served with Administrative Law Judge Thomas' December 16, 2019 ruling given the short time between issuance of the materials and the February 7, 2020 deadline for 2020 WMP submission.
3. The binary nature of maturity model scoring means that if an electrical corporation currently lacks one element of a multi-part requirement, the electrical corporation is deemed to lack maturity on the entire requirement.
4. Use of the maturity model in 2020 allows the WSD to establish a baseline in order to track improvement in wildfire mitigation programs over time. The maturity model should be used primarily to assess an electrical corporation's progress over time.
5. Given that the maturity model is new, further refinement and calibration of the scoring requirements may be necessary.
6. The effectiveness of wildfire mitigation activities contained in electrical corporations' WMPs cannot be determined using "program targets," e.g., number of miles of covered conductor installed or number of trees trimmed.
7. Program targets do not meet the requirements of Public Utilities Code 8386 to establish metrics to evaluate WMP performance.
8. A conditional approval of a WMP identifies each missing or inadequate element in the WMP and requires specific action to remedy the problem according to particular timelines. The 2020 WMP Resolutions for each electrical corporation contain a set of "Deficiencies" and associated "Conditions" to remedy those deficiencies. Each deficiency is categorized into one of the following categories, with Class A being the most serious:
  - Class A – aspects of the WMP are lacking or flawed;
  - Class B – insufficient detail or justification provided in WMP;

- Class C – gaps in baseline or historical data, as required in 2020 WMP Guidelines.
9. Class A deficiencies are of the highest concern and require an electrical corporation to develop and submit to WSD, within 45 days of Commission ratification of WMP Resolutions, an RCP to resolve the identified deficiency. An RCP must present all missing information and/or articulate the electrical corporation's plan, including proposed timeline, to bring the electrical corporation's WMP into compliance.
  10. Class B deficiencies are of medium concern and require reporting on a quarterly basis by the electrical corporation to provide missing data or update its progress. This quarterly reporting is in addition to Tier 1 advice letters filings mandated in Public Utilities Code § 8389(e)(7).
  11. Class C deficiencies require the electrical corporation to submit additional detail and information or otherwise come into compliance in its 2021 annual WMP update.
  12. Each of the following electrical corporations' WMPs contain the Guidance Deficiencies set forth in Appendix A: PG&E, SCE, SDG&E, PacifiCorp, Liberty and Bear Valley.
  13. WSD has reviewed the 2020 WMP submissions for compliance with the ordering paragraphs contained in the Commission's 2019 decisions on each electrical corporation's 2019 WMP. Each 2019 ordering paragraph has either been addressed in the electrical corporation's 2020 WMP or is the subject of Conditions in this Resolution or the individual Resolutions being issued this year.
  14. It is essential that there be a process for modifying, reducing, increasing, or ending mitigation measures that are not working, or otherwise require modification.
  15. Pub. Util. Code § 8386.3(a) requires WSD to consult with CAL FIRE in reviewing electrical corporations' 2020 WMPs. The Commission and CAL FIRE have a memorandum of understanding in place to facilitate this consultation (Pub. Util. Code § 8386.5). The Commission and WSD have met these requirements, but neither this Resolution nor the Resolutions on the individual WMPs purport to speak for CAL FIRE.
  16. WSD is required by Pub. Util. Code § 8386(b) to 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 WSD 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.

17. Trans Bay Cable, LLC and Horizon West Transmission are differently situated to the other electrical corporations, having minimal ignition risk due to their locations and footprints. WSD will issue guidance to Trans Bay Cable and Horizon West Transmission on the required contents of 2021 WMP updates. The WSD will also consider a more streamlined data and submission process for these companies in advance of their next comprehensive WMP filing in 2023.

**THEREFORE, IT IS ORDERED THAT:**

1. The Wildfire Safety Division's Guidance on 2020 Wildfire Mitigation Plans is, hereby ratified.
2. Nothing in this Resolution constitutes approval of the costs associated with electrical corporations' Wildfire Mitigation Plan (WMP) efforts. As set forth in Public Utilities Code §8386(g), and confirmed by Decision 19-05-036, the Commission will consider costs recovery related to WMPs in the electrical corporations' General Rate Cases or application permitted by Section 8386.4(b)(2).
3. Electrical corporations shall make every effort to keep Wildfire Mitigation Plan implementation progress on track in order to ensure that electrical corporations are prepared for the upcoming and subsequent wildfire seasons while complying with direction from public health officials regarding shelter-in-place, social distancing, or other measures that may need to be taken in response to the COVID-19 pandemic.
4. Electrical corporations shall thoroughly incorporate COVID-19 orders, response activities, and other considerations into their Public Safety Power Shutoff (PSPS) operations and protocols and follow orders issued by the Commission in Rulemaking 18-12-005 or any other Commission orders pertaining to PSPS.
5. All electrical corporations shall submit an update to their 2020 Wildfire Mitigation Plans in 2021. The Wildfire safety Division will issue a schedule for such submission separately and may stagger the electrical corporations' submissions.
6. Each of the following electrical corporations: Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, PacifiCorp, Liberty Utilities, and Bear Valley Electric Service shall

comply with the Guidance Conditions set forth in Appendix A to this Resolution in order for its Wildfire Mitigation Plan to be deemed in compliance with Public Utilities Code Section 8386 and the Wildfire Safety Division's Wildfire Mitigation Plan Guidelines. In complying with each Condition, the named electrical corporations shall look to the corresponding Deficiency for guidance.

7. For Class A deficiencies, Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, PacificCorp, Liberty Utilities, and Bear Valley Electric Service must submit Remedial Compliance Plans (RCP) to the Director of the Wildfire Safety Division within 45 days of Commission ratification of the Wildfire Mitigation Plan Resolutions. An RCP must present all missing information and/or articulate the electrical corporation's plan, including proposed timeline, to bring the electrical corporation's WMP into compliance. RCPs shall be named "[Name]'s 2020 Wildfire Mitigation Plan Remedial Compliance Plan." Submission of all reports shall be by e-mail to the Director of the Wildfire Safety Division at [WildfireSafetyDivision@cpuc.ca.gov](mailto:WildfireSafetyDivision@cpuc.ca.gov). The electrical corporations shall concurrently serve all reports on the Department of Forestry and Fire Protection at [Mike.Wilson@fire.ca.gov](mailto:Mike.Wilson@fire.ca.gov) and on the service list in Rulemaking 18-10-007 consistent with the procedures set forth in Rules 1.9 and 1.10 of the Commission's Rules of Practice and Procedure.
8. For Class B deficiencies, Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, PacificCorp, Liberty Utilities, and Bear Valley Electric Service must submit quarterly reports to the Director of the Wildfire Safety Division. Information requested in the quarterly reports shall be submitted either one time in the first quarterly report or on an ongoing basis as specified by each condition. The quarterly reports shall be named "[Name]'s Quarterly Report on 2020 Wildfire Mitigation Plan for [period covered]." The first quarterly report must be submitted 90 days after the Commission ratifies the Wildfire Mitigation Plan Resolutions, and every three months thereafter. In some cases, individual Resolutions impose other additional reporting requirements, and the Resolutions contain relevant detail for those reports with which named electrical corporations must comply. Submission of all quarterly reports shall be by e-mail to the Director of the Wildfire Safety Division at [WildfireSafetyDivision@cpuc.ca.gov](mailto:WildfireSafetyDivision@cpuc.ca.gov). The electrical corporations shall concurrently serve all reports on the Department of Forestry and Fire Protection at [Mike.Wilson@fire.ca.gov](mailto:Mike.Wilson@fire.ca.gov) and on the service list in

Rulemaking 18-10-007 consistent with the procedures set forth in Rules 1.9 and 1.10 of the Commission's Rules of Practice and Procedure.

9. For Class C deficiencies, Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, PacifiCorp, Liberty Utilities, and Bear Valley Electric Service must submit additional detail and information or otherwise come into compliance in its 2021 annual Wildfire Mitigation Plan update.
10. Electrical corporations seeking to modify, reduce, increase or end any initiatives in its Wildfire Mitigation Plan prior to the 2021 Wildfire Mitigation Plan update shall submit a letter to Wildfire Safety Division entitled "Reports on Possible Off Ramps" describing any concerns about the effectiveness of any program in the Wildfire Mitigation Plan. The first such letter shall be submitted no later than 6 months from the ratification date of this Resolution and the second one no later than 12 months after the ratification date of this Resolution. Submission shall be by e-mail to the Director of the Wildfire Safety Division at [WildfireSafetyDivision@cpuc.ca.gov](mailto:WildfireSafetyDivision@cpuc.ca.gov). The electrical corporations shall concurrently serve all reports on the Department of Forestry and Fire Protection at [Mike.Wilson@fire.ca.gov](mailto:Mike.Wilson@fire.ca.gov) and on the service list in Rulemaking 18-10-007 consistent with the procedures set forth in Rules 1.9 and 1.10 of the Commission's Rules of Practice and Procedure.
11. Each electrical corporation shall meet the listed conditions in its individual Resolution in full in order for its Wildfire Mitigation plan to be deemed in compliance with Public Utilities Code Section 8386 and Wildfire Mitigation Plan Guidelines.

This Resolution is effective today.

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

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Alice Stebbins  
Executive Director

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA**

RESOLUTION WSD-002 Guidance Resolution on 2020 Wildfire  
Mitigation Plans Pursuant to Public Utilities Code Section 8386.

**INFORMATION REGARDING SERVICE**

I have electronically served all persons on the attached official service list who have provided an e-mail address for R.18-10-007.

Upon confirmation of this document's acceptance for filing, I will cause a Notice of Availability of the document to be served by U.S. mail on all parties listed in the "Party" category of the official service list for whom no e-mail address is provided.

The official service list I use is current as of today's date.

Dated May 7, 2020, at San Francisco, California.

/s/ GABRIELA PEREZ

Gabriela Perez

**N O T I C E**

Persons should notify the Process Office, Public Utilities Commission, 505 Van Ness Avenue, Room 2000, San Francisco, CA 94102, of any change of address to ensure that they continue to receive documents. You must indicate the proceeding number on the service list on which your name appears.

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The Commission's policy is to schedule hearings (meetings, workshops, etc.) in locations that are accessible to people with disabilities. To verify that a particular location is accessible, call: Calendar Clerk (415) 703-1203.

If specialized accommodations for the disabled are needed, e.g., sign language interpreters, those making the arrangements must call the Public Advisor at (415) 703-2074 or TDD# (415) 703-2032 five working days in advance of the event.

\*\*\*\*\* **SERVICELIST** \*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

\*\*\*\*\* **PARTIES** \*\*\*\*\*

William B. Abrams  
Community Advocate  
1519 BRANCH OWL PLACE  
SANTA ROSA CA 95409  
(707) 787-7759  
End2EndConsulting@gmail.com  
For: William B. Abrams

---

Rachael E. Koss  
Attorney  
ADAMS BROADWELL JOSEPH & CARDOZO  
601 GATEWAY BLVD., SUITE 1000  
SOUTH SAN FRANCISCO CA 94080  
(650) 589-1660 X13  
RKoss@AdamsBroadwell.com  
For: Coalition of California Utility Employees (CUE)

---

Michael J. Agurre, Esq.  
AGUIRRE & SEVERSON LLP  
501 WEST BROADWAY, SUITE 1050  
SAN DIEGO CA 92101  
(619) 876-5364  
maguirre@amslawyers.com  
For: Ruth Henricks

---

Valerie Pryor  
Gen. Mgr.  
ALAMEDA COUNTY FLOOD CONTROL AND WATER  
100 NORTH CANYONS PARKWAY  
LIVERMORE CA 94551  
(925) 454-5000  
vpryor@zone7water.com  
For: Alameda County Flood Control and Water Conservation  
District, Zone 7

---

David J. Miller  
Avp - Sr. Legal Counsel  
AT&T SERVICES, INC.  
430 BUSH STREET, 6TH FL.  
SAN FRANCISCO CA 94108  
(415) 268-9497  
DavidJMiller@att.com  
For: AT&T

---

Keith Switzer  
BEAR VALLEY ELECTRIC SERVICE  
630 EAST FOOTHILL BLVD.  
SAN DIMAS CA 91773  
(909) 394-3600 X-759  
kswitzer@gswater.com  
For: Bear Valley Electric Service, div of Golden State Water  
Company

---

Christi Hogin  
Counsel  
BEST BEST & KRIEGER LLP  
1230 ROSECRANS AVE., STE. 110  
MANHATTAN BEACH CA 90266  
(310) 643-8448  
Christi.Hogin@bbkLaw.com  
For: City of Malibu

---

Douglas E. Coty  
Attorney  
BOLD, POLISNER, MADDOW, NELSON & JUDSON  
2125 OAK GROVE ROAD, SUITE 210  
WALNUT CREEK CA 94598  
(925) 933-7777  
DCoty@bpmnj.com  
For: Contra Costa Water District

---

Justin Wynne  
Attorney  
BRAUN BLAISING SMITH WYNNE, P.C.  
915 L STREET, STE. 1480  
SACRAMENTO CA 95814  
(916) 326-5813  
Wynne@BraunLegal.com  
For: California Municipal Utilities Association (CMUA)

---

Evelyn Kahl  
Attorney  
BUCHALTER, A PROFESSIONAL CORPORATION  
55 SECOND STREET, SUITE 1700  
SAN FRANCISCO CA 94105-3493  
(415) 227-3563  
EKahl@Buchalter.com  
For: Energy Producers and Users Coalition

---

Michael Alcantar  
Attorney At Law  
BUCHALTER, A PROFESSIONAL CORPORATION  
55 SECOND STREET, SUITE 1700  
SAN FRANCISCO CA 94105

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

(415) 227-0900  
MAlcantar@Buchalter.com  
For: Western States Petroleum Association

---

Nora Sheriff, Esq.  
Counsel  
BUCHALTER, A PROFESSIONAL CORPORATION  
55 SECOND STREET, STE. 1700  
SAN FRANCISCO CA 94105  
(415) 227-3551  
NSheriff@Buchalter.com  
For: California Large Energy Consumers Association (CLECA)

---

Luisa F. Elkins  
Sr. Deputy City Attorney  
CITY OF SAN JOSE  
200 EAST SANTA CLARA ST., 16TH FL TOWER  
SAN JOSE CA 95113-1905  
(408) 535-1953  
Luisa.Elkins@SanJoseCa.gov  
For: City of San Jose

---

Jerome F. Candelaria  
Vp & Counsel, Regulatory Affairs  
CALIFORNIA CABLE AND TELECOMM. ASSN.  
1001 K STREET, 2ND FL.  
SACRAMENTO CA 95814-3832  
(916) 446-7732  
Jerome@CalCable.org  
For: California Cable and Telecommunications Association

---

Shana Lazerow  
Attorney  
COMMUNITIES FOR A BETTER ENVIRONMENT  
120 BROADWAY, SUITE 2  
RICHMOND CA 94804  
(510) 302-0430 X18  
SLazerow@cbecal.org  
For: California Environmental Justice Alliance (CEJA)

---

Karen Noreen Mills  
Sr. Attorney  
CALIFORNIA FARM BUREAU FEDERATION  
2600 RIVER PLAZA DRIVE  
SACRAMENTO CA 95833  
(916) 561-5655  
KMills@CFBF.com  
For: California Farm Bureau Federation

---

Kelley Williams  
COUNTY OF INYO  
PO DRAWER N  
INDEPENDENCE CA 93526  
(760) 878-0120  
KWilliams@inyoCounty.us  
For: County of Inyo

---

John Larrea  
Dir - Govn'T Affairs  
CALIFORNIA LEAGUE OF FOOD PRODUCERS  
2485 NATOMAS PARK DRIVE, STE. 550  
SACRAMENTO CA 95833  
(916) 640-8150  
John@clfp.com  
For: California League of Food Producers

---

J. Scott Kuhn  
COUNTY OF LOS ANGELES  
OFFICE OF THE COUNTY COUNSEL  
500 WEST TEMPLE STREET, STE 652  
LOS ANGELES CA 90012-2713  
(213) 974-1852  
SKuhn@Counsel.LAcounty.gov  
For: County of Los Angeles

---

Peter Smith  
CITIZENS TRANSMISSION LLC  
88 BLACK FALCON AVENUE, SUITE 342  
BOSTON MA 02210  
Peter\_Smith@CitizensEnergy.com  
For: Citizens Transmission LLC

---

Tiffany M. Lin  
Deputy County Counsel  
COUNTY OF SANTA CLARA  
70 W. HEDDING ST., EAST WING, 9TH FL.  
SAN JOSE CA 95110  
(408) 299-5900  
Tiffany.M.Lin@CCO.SCCgov.org  
For: County of Santa Clara

---

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

William Rostov  
Deputy City Attorney  
CITY AND COUNTY OF SAN FRANCISCO  
CITY HALL  
1 DR CARLTON B. GOODLET PL. RM 234  
SAN FRANCISCO CA 94102-4682  
(415) 554-4700  
William.Rostov@SFcityAtty.org  
For: City and County of San Francisco

---

Jason Hoppin  
COUNTY OF SANTA CRUZ  
ADMIN. OFFICE  
701 OCEAN STREET  
SANTA CRUZ CA 95060  
(831) 454-2100  
Jason.Hoppin@SantaCruzCounty.us  
For: County of Santa Cruz

---

Christopher Clay  
Legal Division  
RM. 4300  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1123  
cec@cpuc.ca.gov  
For: Office of The Safety Advocate (OSA)

---

Megan Somogyi  
Attorney  
GOODIN, MACBRIDE, SQUERI & DAY, LLP  
505 SANSOME STREET, STE. 900  
SAN FRANCISCO CA 94111  
(415) 392-7900  
MSomogyi@GoodinMacBride.com  
For: County of Mendocino

---

Jedediah J. Gibson  
Attorney  
ELLISON SCHNEIDER HARRIS & DONLAN LLP  
2600 CAPITOL AVENUE, SUITE 400  
SACRAMENTO CA 95816-5931  
(916) 447-2166  
JJG@ESlawFirm.com  
For: Bear Valley Electric Service (BVES) / Liberty Utilities  
(CalPeco Electric)

---

Megan Somogyi  
Attorney  
GOODIN, MACBRIDE, SQUERI, & DAY, LLP  
505 SANSOME ST., STE. 900  
SAN FRANCISCO CA 94111  
(415) 392-7900  
MSomogyi@GoodinMacBride.com  
For: County of Sonoma

---

Lynn Haug  
Attorney  
ELLISON SCHNEIDER HARRIS & DONLAN LLP  
2600 CAPITOL AVE., STE. 400  
SACRAMENTO CA 95816  
(916) 447-2166  
LMH@ESLawFirm.com  
For: East Bay Municipal Utility District

---

Charlyn A. Hook  
Legal Division  
RM. 5123  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-3050  
chh@cpuc.ca.gov  
For: Public Advocates Office

---

Ronald Liebert  
Attorney At Law  
ELLISON SCHNEIDER HARRIS & DONLAN LLP  
2600 CAPITOL AVENUE, STE. 400  
SACRAMENTO CA 95816  
(916) 447-2166  
RL@eslawfirm.com  
For: California Manufacturers & Technology Assn. (CMTA)

---

Tim Lindl  
Partner  
KEYES & FOX LLP  
436 14TH STREET, SUITE 1305  
OAKLAND CA 94612  
(510) 314-8385  
TLindl@KeyesFox.com  
For: Sunrun Inc.

---

Megan Somogyi  
Attorney

Irene K. Moosen  
Attorney At Law  
LAW OFFICE OF IRENE K. MOOSEN



\*\*\*\*\***SERVICELIST**\*\*\*\*\*

**Last Updated on 07-MAY-2020 by: AMT  
R1810007LIST**

GOODIN, MACBRIDE, SQUERI & DAY, LLP  
505 SANSOME STREET, STE 900  
SAN FRANCISCO CA 94111  
(415) 392-7900  
MSomogyi@GoodinMacBride.com  
For: City of Santa Rosa

---

Megan Somogyi  
Attorney  
GOODIN, MACBRIDE, SQUERI & DAY, LLP  
505 SANSOME STREET, STE. 900  
SAN FRANCISCO CA 94111  
(415) 392-7900  
MSomogyi@GoodinMacBride.com  
For: City of Placerville

---

David L. Huard  
Attorney  
MANATT, PHELPS & PHILLIPS, LLP  
ONE EMBARCADERO CENTER, 30TH FL.  
SAN FRANCISCO CA 94111-3736  
(415) 291-7430  
DHuard@manatt.com28  
For: City of Laguna Beach

---

Diane Conklin  
Spokesperson  
MUSSEY GRADE ROAD ALLIANCE  
PO BOX 683  
RAMONA CA 92065  
(760) 787-0794  
dj0Conklin@Earthlink.net  
For: Mussey Grade Road Alliance

---

Jeffery Richard  
Chief Deputy County Counsel  
OFFICE OF THE NAPA COUNTY COUNSEL  
1195 THIRD ST, SUITE 301  
NAPA CA 94559  
(707) 253-4234  
Jeffery.Richard@CountyOfNapa.org  
For: County of Napa

---

Alyssa Koo  
Attorney  
PACIFIC GAS AND ELECTRIC COMPANY  
77 BEALE STREET, B30A  
SAN FRANCISCO CA 94105  
(415) 973-3386

53 SANTA YNEZ STREET  
SAN FRANCISCO CA 94112  
(415) 587-7343  
Irene@igc.org  
For: Local Government Sustainable Energy Coalition (LGSEC)

---

Daniel Marsh  
Mgr - Rates & Regulatory Affairs  
LIBERTY UTILITIES (CALPECO ELECTRIC) LLC  
933 ELOISE AVENUE  
SOUTH LAKE TAHOE CA 96150  
(562) 299-5104  
Dan.Marsh@LibertyUtilities.com  
For: Liberty Utilities (CalPecoElectric)

---

Malinda Dickenson  
General Counsel  
PROTECT OUR COMMUNITIES FOUNDATION  
4452 PARK BLVD., STE 202  
SAN DIEGO CA 92116  
(858) 521-8492  
Malinda@ProtectOurCommunities.org  
For: Protect Our Communities Foundation

---

Staci Heaton  
Regulatory Affairs Advocate  
RURAL COUNTY REPRESENTATIVES OF CALIF.  
1215 K ST., STE. 1650  
SACRAMENTO CA 95814  
(916) 447-4806  
SHeaton@RCRCnet.org  
For: Rural County Representatives of California

---

Kirstie C. Raagas  
Regulatory Counsel  
SAN DIEGO GAS & ELECTRIC COMPANY  
8330 CENTURY PARK COURT, CP32F  
SAN DIEGO CA 92123  
(619) 699-5003  
KRagas@SemptraUtilities.com  
For: San Diego Gas & Electric Company

---

Matthew J. Sanders  
Deputy County Counsel  
SAN MATEO COUNTY COUNSELâ€™S OFFICE  
400 COUNTY CENTER, 6TH FL  
REDWOOD CITY CA 94063  
(650) 363-4461

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

ATK4@pge.com  
For: Pacific Gas and Electric Company (PG&E)

---

MJSanders@SMCgov.org  
For: Peninsula Clean Energy Authority

---

Cynthia Hansen Mifsud  
Assist. Gen. Counsel  
PACIFICORP  
825 NE MULTNOMAH ST., STE. 1800  
PORTLAND OR 97232  
(503) 813-6566  
Cynthia.Hansen@PacifiCorp.com  
For: Pacific Power, a div of PacifiCorp

---

James M. Birkelund  
President  
SMALL BUSINESS UTILITY ADVOCATES  
548 MARKET STREET, STE. 11200  
SAN FRANCISCO CA 94104  
(415) 602-6223  
James@UtilityAdvocates.org  
For: Small Business Utility Advocates (SBUA)

---

Russell A. Archer  
Sr. Attorney  
SOUTHERN CALIFORNIA EDISON COMPANY  
2244 WALNUT GROVE AVE. / PO BOX 800  
ROSEMEAD CA 91770  
(626) 302-2865  
Russell.Archer@SCE.com  
For: Southern California Edison Company

---

Lenneal K. Gardner  
Principal Attorney  
TRANS BAY CABLE LLC  
ONE LETTERMAN DRIVE, C5-100  
SAN FRANCISCO CA 94129  
(415) 291-2300  
Lenneal.Gardner@TransBayCable.com  
For: Trans Bay Cable LLC

---

Ali Amirali  
STARTRANS IO, LLC  
591 W. PUTNAM AVENUE  
GREENWICH CT 06830  
AAmirali@Starwood.com  
For: Startrans IO, LLC

---

Robert L. Mitchell  
TRANS-ELECT NTD PATH 15, LLC  
1850 CENTENNIAL PARK DRIVE, SUITE 480  
RESTON VA 20191  
RLMitchell@Trans-Elect.com  
For: Trans-Elect NTD Path 15, LLC

---

Alan Stein  
Impacted Individual  
14301 HANSON CIRCLE  
MENDOCINO CA 95460  
(707) 964-6514  
bugadi@comcast.net  
For: Alan Stein

---

Lisa A. Cottle  
Attorney / Partner  
WINSTON & STRAWN LLP  
101 CALIFORNIA STREET, 34TH FL.  
SAN FRANCISCO CA 94111  
(415) 591-1579  
LCottle@Winston.com  
For: Horizon West Transmission, LLC (formerly NextEra Energy  
Transmission West, LLC - NEET West)

---

Gregg Morris  
Director  
THE GREEN POWER INSTITUTE

Hans Laetz

\*\*\*\*\* **SERVICELIST** \*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

2039 SHATTUCK AVE., SUTE. 402  
BERKELEY CA 94704  
(510) 644-2700  
GMorris@emf.net  
For: The Green Power Institute (GPI)

---

Thomas Long  
Legal Director  
THE UTILITY REFORM NETWORK  
785 MARKET ST., STE. 1400  
SAN FRANCISCO CA 94103  
(415) 929-8876 X-303  
TLong@turn.org  
For: TURN

---

Lauren Gill  
Town Mgr.  
TOWN OF PARADISE  
5555 SKYWAY  
PARADISE CA 95969  
(530) 872-6291  
LGill@TownOfParadise.com  
For: Town of Paradise

---

Marc D. Joseph  
Attorney At Law  
ADAMS BROADWELL JOSEPH & CARDOZO  
601 GATEWAY BLVD., STE. 1000  
SOUTH SAN FRANCISCO CA 94080  
(650) 589-1660  
MDJoseph@AdamsBroadwell.com

Miles F. Maurino  
ADAMS BROADWELL JOSEPH & CARDOZO  
601 GATEWAY BLVD., SUITE 1000  
SOUTH SAN FRANCISCO CA 94080  
(650) 589-1660  
MMaurino@AdamsBroadwell.com  
For: Coalition of California Utility Employees (CUE)

---

Maria Byrnes  
Legal Assistant  
AGUIRRE & SEVERSON LLP  
501 WEST BROADWAY, STE. 1050  
SAN DIEGO CA 92101

General Mgr.  
ZUMA BEACH FM BROADCASTERS  
RADIO MALIBU 99.1 FM KBUU  
6402 SURFSIDE WAY  
MALIBU CA 90265  
(424) 442-9862  
HansLaetz@gmail.com  
For: Zuma Beach FM Emergency and Community Broadcasters,  
Inc.

---

\*\*\*\*\* **STATE EMPLOYEE** \*\*\*\*\*

\*\*\*\*\* **INFORMATION ONLY** \*\*\*\*\*

Andrew J. Graf  
Associate Attorney  
ADAMS BROADWELL JOSEPH & CARDOZO  
601 GATEWAY BOULEVARD, SUITE 1000  
SOUTH SAN FRANCISCO CA 94080  
(650) 589-1660 X16  
AGraf@AdamsBroadwell.com

J. Porter Wiseman  
AKIN GUMP STRAUSS HAUER & FELD LLP  
2001 K STREET N.W.  
WASHINGTON DC 20006  
(202) 887-4219  
JWiseman@AkinGump.com  
For: Ad Hoc Committee of Senior Unsecured Noteholders of  
Pacific Gas and Electric Company

---

Andy Umana  
Senior Paralegal  
AT&T SERVICE  
430 BUSH STREET, ROOM 6043  
SAN FRANCISCO CA 94108  
(415) 268-5304  
andy.umana@att.com

Fassil Fenikile  
Dir - Regulatory  
AT&T SERVICES, INC.  
430 BUSH STREET, 5TH FL.

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

(619) 876-5364  
MByrnes@amslawyers.com  
For: Ruth Henricks

---

Maria C. Severson, Esq.  
Attorney  
AGUIRRE & SEVERSON LLP  
501 WEST BROADWAY, STE. 1050  
SAN DIEGO CA 92101-3591  
(619) 876-5364  
MSeverson@amslawyers.com  
For: Ruth Henricks

---

Ashley Vinson Crawford  
AKIN GUMP STRAUSS HAUER & FELD LLP  
580 CALIFORNIA ST, SUITE 1500  
SAN FRANCISCO CA 94104  
(415) 765-9561  
AVCrawford@AkinGump.com  
For: Ad Hoc Committee of Senior Unsecured Noteholders of  
Pacific Gas and Electric Company

---

George D.(Chip) Cannon, Jr.  
AKIN GUMP STRAUSS HAUER & FELD LLP  
580 CALIFORNIA STREET, STE. 1500  
SAN FRANCISCO CA 94104  
(415) 765-9500  
CCannon@AkinGump.com  
For: Ad Hoc Committee of Senior Unsecured Noteholders of  
Pacific Gas and Electric Company

---

Adenike Adeyeye  
Executive Division  
RM. 5214  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2005  
ade@cpuc.ca.gov

Wendy Al-Mukdad  
Safety Policy Division  
AREA 4-A  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2311  
wmp@cpuc.ca.gov

SAN FRANCISCO CA 94108  
(415) 417-5020  
Fassil.T.Fenikile@att.com

Gwen Johnson  
Quality Testing  
AT&T SERVICES, INC.  
430 BUSH STREET, 5TH FL.  
SAN FRANCISCO CA 94108  
(415) 417-5034  
Gwen.Johnson@att.com

Jeffrey Mondon  
Dir - Regulatory  
AT&T SERVICES, INC.  
430 BUSH STREET, 5TH FL  
SAN FRANCISCO CA 94108  
(415) 417-5021  
jeffrey.mondon@att.com

Michelle Choo  
Assistant  
AT&T SERVICES, INC.  
430 BUSH STREET, 3ND FL.  
SAN FRANCISCO CA 94108  
(415) 268-9494  
michelle.choo@att.com

Sultan Banu Acimis  
Safety and Enforcement Division  
180 Promenade Circle, Suite 115  
Sacramento CA 95834 2939  
(916) 928-3826  
sba@cpuc.ca.gov  
For: SED

Marc Stern  
BEAR VALLEY ELECTRIC SERVICE  
42020 GARSTIN DR. / PO BOX 1547  
BIG BEAR LAKE CA 92315  
(909) 866-4678 X151  
marc.stern@bves.com

Nguyen Quan  
Regulatory Affairs Mgr.  
BEAR VALLEY ELECTRIC SERVICE  
630 EAST FOOTHILL BLVD.  
SAN DIMAS CA 91773  
(909) 394-3600 X664  
NQuan@GSwater.com

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

Catherine E. Yap  
BARKOVICH & YAP, INC.  
PO BOX 11031  
OAKLAND CA 94611  
(510) 450-1270  
Cathy@BarkovichAndYap.com

Paul Nelson  
Consultant  
BARKOVICH & YAP, INC.  
PO BOX 11031  
OAKLAND CA 94611  
(707) 937-6203  
Paul@BarkovichAndYap.com

Britt K. Strottman  
BARON & BUDD, P.C.  
11440 WEST BERNARD COURT  
SAN DIEGO CA 92127  
(415) 310-7523  
BStrottman@BaronBudd.com  
For: Counties of Sonoma, Napa, Mendocino, Lake, Yuba,  
Nevada. Cities of Santa Rosa, and Clearlake.

---

Kelcie Abraham  
BCG  
2 EMBARCADERO CENTER SUITE 24  
SF CA 94111  
bcgpolicylists@bcg.com

Eric Cardella  
Supervisor, Engineering & Planning  
BEAR VALLEY ELECTRIC SERVICE  
42020 GARSTIN DRIVE / PO BOX 1547  
BIG BEAR LAKE CA 92315  
(909) 866-4678 X140  
Eric.Cardella@bves.com

Kari Cameron  
Legal Administrator  
BUCHALTER  
EMAIL ONLY  
EMAIL ONLY CA 94105  
(415) 227-3581  
KCameron@Buchalter.com

Gwenn O'Hara

Paul Marconi  
Director  
BEAR VALLEY ELECTRIC SERVICE  
42020 GRASTIN DRIVE / PO BOX 1547  
BIG BEAR LAKE CA 92315  
(909) 202-9539  
Paul.Marconi@bves.com

Deborah Behles  
Of Counsel  
2912 DIAMOND STREET, STE 162  
SAN FRANCISCO CA 94131  
(415) 841-3304  
Deborah.Behles@gmail.com  
For: California Environmental Justice Alliance (CEJA)

---

Benjamin Bodell  
Attorney  
BEST BEST AND KRIEGER LLP  
2001 N MAIN ST., STE. 390  
WALNUT CREEK CA 94596  
(925) 977-3377  
Benjamin.Bodell@bbklaw.com

Joshua Nelson  
Attorney  
BEST BEST AND KRIEGER LLP  
500 CAPITOL MALL, STE. 1700  
SACRAMENTO CA 95814  
(916) 551-2859  
Joshua.Nelson@bbklaw.com

Laura Fernandez  
Attorney  
BRAUN BLAISING SMITH WYNNE, P.C.  
915 L STREET, STE 1480  
SACRAMENTO CA 95814  
(916) 326-5812  
Fernandez@BraunLegal.com  
For: California Municipal Utilities Association

---

Billie C. Blanchard  
Energy Division  
AREA 4-A  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2068  
bcb@cpuc.ca.gov

Truman L. Burns

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

Attorney  
BUCHALTER, A PROFESSIONAL CORPORATION  
500 CAPITOL MALL, SUITE 1900  
SACRAMENTO CA 95814  
(916) 945-5170  
GOHara@Buchalter.com

Lillian Rafii  
Attorney  
BUCHALTER, A PROFESSIONAL CORPORATION  
55 SECOND STREET, STE. 1700  
SAN FRANCISCO CA 94105-3493  
(415) 227-3586  
LRafii@Buchalter.com  
For: Energy Producers and Users Coalition

---

Meghan Thomas, Esq.  
Associate  
BUCHALTER, A PROFESSIONAL CORPORATION  
500 CAPITOL MALL, SUITE 1900  
SACRAMENTO CA 95814  
(916) 945-5176  
MThomas@Buchalter.com

Michael Cade  
Analyst - Energy & Nat'L Resources  
BUCHALTER, A PROFESSIONAL CORPORATION  
55 SECOND STREET, SUITE 1700  
SAN FRANCISCO CA 94105  
(415) 227-3583  
MCade@Buchalter.com

Sarbjit Bagri  
Safety Policy Division  
180 Promenade Circle, Suite 115  
Sacramento CA 95834 2939  
(916) 713-4143  
sab@cpuc.ca.gov

Andie Biggs  
Safety and Enforcement Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-3305  
ab6@cpuc.ca.gov

Mavis Scanlon  
Editor  
CALIFORNIA ENERGY MARKETS

Public Advocates Office  
RM. 4205  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2932  
txb@cpuc.ca.gov

Henry Burton  
Public Advocates Office  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-7311  
hnb@cpuc.ca.gov

Diane Fellman  
Vice Chair  
CA WILDFIRE SAFETY ADVISORY BOARD  
EMAIL ONLY  
EMAIL ONLY CA 00000  
diane.fellman@cpuc.ca.gov

Rachel A. Gold, Esq.  
Climate Chg Program  
CALIFORNIA AIR RESOURCES BOARD  
EMAIL ONLY  
EMAIL ONLY CA 00000  
(916) 323-0560  
rachel.gold@arb.ca.gov

Benjamin Dawson  
CALIFORNIA COMMUNITY CHOICE ASSOCIATION  
EMAIL ONLY  
EMAIL ONLY CA 00000  
regulatory@cal-cca.org  
For: CalCCA

---

Kavya Balaraman  
Staff Writer / Reporter  
CALIFORNIA ENERGY MARKETS  
EMAIL ONLY  
EMAIL ONLY CA 00000  
(415) 963-4439 X16  
Kavya@NewsData.com

Tony Brunello  
CALIFORNIA STRATEGIES & ADVOCACY, LLC  
1 EMBARCADERO CENTER, STE. 1060

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

425 DIVISADERO ST., STE 303  
SAN FRANCISCO CA 94117  
(415) 963-4439 X12  
Mavis@NewsData.com

Alex J. Morris  
Vp - Policy & Opers  
CALIFORNIA ENERGY STORAGE ALLIANCE  
2150 ALLSTON WAY, STE.400  
BERKELEY CA 94704  
(510) 665-7811 X110  
CESA\_Regulatory@StorageAlliance.org

Deborah Behles  
Of Counsel  
CALIFORNIA ENVIRONMENTAL JUSTICE ALLIANC  
2912 DIAMOND STREET, NO. 160  
SAN FRANCISCO CA 94131  
(415) 841-3304  
Deborah.Behles@gmail.com

Jordan Pinjuv  
Sr. Counsel  
CALIFORNIA INDEPENDENT SYSTEM OPERATOR  
250 OUTCROPPING WAY  
FOLSOM CA 95630  
(916) 351-4429  
JPinjuv@caiso.com  
For: California ISO

---

Matthew Karle  
Public Advocates Office  
CALIFORNIA PUBLIC UTILITIES COMMISSION  
EMAIL ONLY  
EMAIL ONLY CA 00000  
(415) 703-1850  
mk3@cpuc.ca.gov

Nick Cronenwett  
Legislative Analyst  
CALIFORNIA STATE ASSOC. OF COUNTIES  
1100 K STREET, STE 101  
SACRAMENTO CA 95814  
(916) 650-8108 X531  
NCronenwett@Counties.org

SAN FRANCISCO CA 94111  
(916) 718-8292  
TBrunello@outlook.com

Jennifer Capitolo  
Exe Dir  
CALIFORNIA WATER ASSOCIATION  
601 VAN NESS AVENUE, STE. 2047  
SAN FRANCISCO CA 94102-6316  
(415) 561-9650  
JCapitolo@CalWaterAssn.com

Katherine C. Piper  
Regional Managing Counsel  
CALPINE COPORATION  
4160 DUBLIN BLVD., STE. 100  
DUBLIN CA 94568  
(925) 557-2252  
Katherine.Piper@Calpine.com

Avis Kowalewski  
Vp - Gov'T & Regulatory Affairs  
CALPINE CORPORATION  
4160 DUBLIN BLVD, SUITE 100  
DUBLIN CA 94568  
(925) 557-2284  
Avis.Kowalewski@Calpine.com

CAMERON-DANIEL, P.C.  
EMAIL ONLY  
EMAIL ONLY CA 00000  
Team@Cameron-Daniel.com

Gregory Reiss  
CENTENUS GLOBAL MANAGEMENT, LP  
437 MADISON AVENUE, SUITE 19B  
NEW YORK NY 10022  
(212) 763-0909  
Gregory.Reiss@CentenusLP.com

Stephen R. Cieslewicz  
Uvm Consultant  
EMAIL ONLY  
EMAIL ONLY CA 00000  
(707) 591-6862  
Steve@UtilityArborist.net

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

Frank Lindh  
Attorney  
CITIZENS ENERGY CORPORATION  
110 TAYLOR STREET  
SAN RAFAEL CA 94901  
(415) 596-3931  
FrankRichLindh@gmail.com  
For: Citizens Energy Corporation

---

William K. Sanders  
Deputy City Attorney  
CITY AND COUNTY OF SAN FRANCISCO  
CITY HALL RM 234  
1 DR. CARLTON B. GOODLETT PLACE  
SAN FRANCISCO CA 94102-4682  
(415) 554-6771  
William.Sanders@sfCityAtty.org  
For: City and County of San Francisco

---

William R. Smith  
City Mgr  
CITY OF COLTON  
650 N. LA CADENA DRIVE  
COLTON CA 92324  
(909) 370-5099  
For: City of Colton

---

John Driscoll  
City Attorney  
CITY OF PLACERVILLE  
31001 CENTER STREET  
PLACERVILLE CA 95667  
(530) 642-5200  
JDriscoll@CityOfPlacerville.org  
For: City of Placerville

---

Yue-Han Chow  
Sr. Deputy City Attorney  
CITY OF SAN JOSE  
200 E. SANTA CLARA STREET, 16TH FL  
SAN JOSE CA 95113  
(408) 535-1201  
Yue-Han.Chow@SanJoseCa.gov

Elisa Tolentino  
Sr. Deputy City Attorney  
CITY OF SAN JOSE  
OFFICE OF THE CITY ATTORNEY

Adam Abel  
Assist. City Attorney  
CITY OF SANTA ROSA  
100 SANTA ROSA AVENUE, RM 8  
SANTA ROSA CA 95404  
(707) 543-3050  
SGallagher@SRcity.org

Sue A. Gallagher  
City Attorney  
CITY OF SANTA ROSA  
100 SANTA ROSA AVE., RM 8  
SANTA ROSA CA 95404  
(707) 543-3050  
SGallagher@SRcity.org

Mark T. Prestwich  
City Mgr  
CITY OF ST. HELENA  
1480 MAIN STREET  
ST. HELENA CA 94574  
(707) 312-0252  
MPrestwich@CityofStHelena.org  
For: City of St. Helena

---

Kevin Collins  
PO BOX 722  
FELTON CA 95018  
(831) 234-7306  
Europa@Cruzio.com  
For: Kevin Collins

---

Mary Neher  
District Secretary  
CONTRA COSTA WATER DISTRICT  
PO BOX H20  
CONCORD CA 94524  
(925) 688-8024  
MNeher@CCwater.com

Mark P. Schreiber  
Attorney  
COOPER, WHITE & COOPER LLP  
201 CALIFORNIA STREET, 17TH FL.  
SAN FRANCISCO CA 94111  
(415) 433-1900  
MSchreiber@cwclaw.com



\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

200 EAST SANTA CLARA STREET, 16TH FL.  
SAN JOSE CA 95113  
(408) 535-1953  
Elisa.Tolentino@SanJoseCa.gov

John R. Todd  
Dep. Chief-Prevention Svcs. Bureau  
COUNTY OF LOS ANGELES FIRE DEPT.  
1320 N. EASTERN AVENUE, RM. 254  
LOS ANGELES CA 90063-3294  
(323) 881-2461  
John.Todd@Fire.LAcounty.gov  
For: County of Los Angeles

---

Katharine L. Elliott  
County Counsel  
COUNTY OF MENDOCINO  
501 LOW GAP ROAD, RM 1030  
UKIAH CA 95482  
(707) 234-6885  
ElliottK@co.mendocino.ca.us  
For: County of Mendocino

---

Elizabeth G. Pianca  
Lead Deputy County Counsel  
COUNTY OF SANTA CLARA  
70 W. HEDDING ST., EAST WING, 9TH FL.  
SAN JOSE CA 95110  
(408) 299-5900  
Elizabeth.Pianca@CCO.SCCgov.org

Steve M. Mitra  
Assist. County Counsel  
COUNTY OF SANTA CLARA  
70 W. HEDDING ST., EAST WING, 9TH FL.  
SAN JOSE CA 95110  
(408) 299-5900  
Steve.Mitra@CCO.SCCgov.org  
For: County of Santa Clara

---

Bruce Goldstein  
County Counsel  
COUNTY OF SONOMA  
575 ADMINISTRATION DRIVE, ROOM 105-A  
SANTA ROSA CA 95403  
(707) 565-2421  
Bruce.Goldstein@sonoma-county.org

Petra Bruggisser  
Deputy County Counsel  
COUNTY OF SONOMA  
575 ADMINISTRATION DRIVE, ROOM 105-A  
SANTA ROSA CA 94503  
(707) 565-2421  
Petra.Bruggisser@sonoma-county.org

Esther Northrup  
State Regulatory Affairs  
COX CALIFORNIA TELCOM, LLC  
5887 COPLEY DRIVE, STE. 300  
SAN DIEGO CA 92111  
(858) 836-7308  
Esther.Northrup@cox.com

CPUC - LEGAL  
EMAIL ONLY  
EMAIL ONLY CA 00000  
AppRhg@cpuc.ca.gov

Paul Schulman  
Sr Research Fellow  
CTR FOR CATASTROPHIC RISK MGNT  
MILLS COLLEGE  
UNIVERSITY OF CALIFORNIA  
BERKELEY CA 94720  
(925) 376-7682  
Paul@Mills.edu

Shelby Chase  
Public Advocates Office  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-5402  
sz2@cpuc.ca.gov

Franz Cheng  
Energy Division  
AREA 4-A  
300 Capitol Mall  
Sacramento CA 95814 4309  
(415) 703-1536  
fcc@cpuc.ca.gov

Christopher Chow

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

Cory Oâ€™Donnell  
Chief Deputy County Counsel  
COUNTY OF SONOMA  
575 ADMINISTRATION DRIVE, ROOM 105-A  
SANTA ROSA CA 95403  
(707) 565-2421  
Cory.ODonnell@sonoma-county.org

Executive Division  
RM. 5301  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2234  
crs@cpuc.ca.gov

Charles Christiansen  
Communications Division  
AREA 3-E  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-3212  
chc@cpuc.ca.gov

Jim Tomlinson  
DAVIS WRIGHT TREMAINE LLP  
505 MONTGOMERY STREET, SUITE 800  
SAN FRANCISCO CA 94111  
(415) 276-6587  
JimTomlinson@dwt.com

Carolina Contreras  
Safety Policy Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-5125  
ccg@cpuc.ca.gov

Patrick Ferguson  
Attorney  
DAVIS WRIGHT TREMAINE LLP  
505 MONTGOMERY STREET, SUITE 800  
SAN FRANCISCO CA 94111  
(415) 276-6500  
PatrickFerguson@dwt.com

Cheryl Cox  
Energy Division  
300 Capitol Mall  
Sacramento CA 95814 4309  
(916) 327-6799  
cxc@cpuc.ca.gov

Steve Greenwald  
Attorney  
DAVIS WRIGHT TREMAINE LLP  
505 MONTGOMERY STREET, STE. 800  
SAN FRANCISCO CA 94111  
(415) 276-6500  
SteveGreenwald@dwt.com  
For: AD HOC Committee of Sr Unsecured Noteholders of  
PG&E: Angelo, Gordon & Co., LP; Apollo Global Management  
LLC; Aurelius Capital Mgmt, LP; Canyon Capital Advisors LLC;  
Capital Group; Carval Investors; Castle Hook Partners LLP;  
Citadel Advisors LLC; Citigroup Global Markets: Cyrus Capital  
Partners, LP; Davidson Kempner Capital Mgmt LP; Deutsche  
Bank Securities Inc.; Diameter Capital Partners LP; Elliott Mgmt  
Corp; Farallon Capital Mgmt LLC; Fir Tree Partners; Oaktree  
Capital Mgmt, LP; Och-Ziff Capital Mgmt Group LLC; Pacific  
Investment Mgmt Co. LLC; Pacific Life Ins. Co; P. Schoenfeld  
Asset Mgmt LP; Senator Investment Group LP; Taconic Capital  
Advisors LP; Third Point LLC; and Varde Partners, Inc.

DAVIS WRIGHT TREMAINE LLP  
505 MONTGOMERY STREET, STE. 800  
SAN FRANCISCO CA 94111  
(415) 276-6587  
DWTcpucDockets@dwt.com

Anna Fero  
Attorney  
DAVIS WRIGHT TREMAINE LLP  
505 MONTGOMERY STREET, SUITE 800  
SAN FRANCISCO CA 94111  
(415) 276-6500  
AnnaFero@dwt.com

Suzanne Toller  
Attorney  
DAVIS WRIGHT TREMAINE LLP  
505 MONTGOMERY STREET, SUITE 800

David Huang  
Attorney  
DAVIS WRIGHT TREMAINE LLP  
505 MONTGOMERY STREET, SUITE 800

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

SAN FRANCISCO CA 94111  
(415) 276-6500  
DavidHuang@dwt.com

I Sultan  
Associate  
DAVIS WRIGHT TREMAINE LLP  
505 MONTGOMERY STREET, STE. 800  
SAN FRANCISCO CA 94111  
(415) 276-6539  
TahiyaSultan@dwt.com

SAN FRANCISCO CA 94111-6533  
(415) 276-6500  
SuzanneToller@dwt.com

Vidhya Prabhakaran  
Attorney  
DAVIS WRIGHT TREMAINE LLP  
505 MONTGOMERY ST., STE. 800  
SAN FRANCISCO CA 94111  
(415) 276-6500  
VidhyaPrabhakaran@dwt.com  
For: AD HOC Committee of Sr Unsecured Noteholders of  
PG&E: Angelo, Gordon & Co., LP; Apollo Global Management  
LLC; Aurelius Capital Mgmt, LP; Canyon Capital Advisors LLC;  
Capital Group; Carval Investors; Castle Hook Partners LLP;  
Citadel Advisors LLC; Citigroup Global Markets: Cyrus Capital  
Partners, LP; Davidson Kempner Capital Mgmt LP; Deutsche  
Bank Securities Inc.; Diameter Capital Partners LP; Elliott Mgmt  
Corp; Farallon Capital Mgmt LLC; Fir Tree Partners; Oaktree  
Capital Mgmt, LP; Och-Ziff Capital Mgmt Group LLC; Pacific  
Investment Mgmt Co. LLC; Pacific Life Ins. Co; P. Schoenfeld  
Asset Mgmt LP; Senator Investment Group LP; Taconic Capital  
Advisors LP; Third Point LLC; and Varde Partners, Inc.

---

Katie Jorrie  
Attorney  
DAVIS WRIGHT TREMAINE, LLP  
505 MONTGOMERY STREET, SUITE 800  
SAN FRANCISCO CA 94111  
(415) 276-6500  
KatieJorrie@dwt.com

John W. Leslie, Esq  
Attorney  
DENTONS US LLP  
EMAIL ONLY  
EMAIL ONLY CA 92121  
(619) 699-2536  
John.Leslie@dentons.com

Daniel W. Douglass  
Attorney At Law  
DOUGLASS & LIDDELL  
4766 PARK GRANADA, SUITE 209

Drucilla Dunton  
Safety and Enforcement Division  
300 Capitol Mall  
Sacramento CA 95814 4309  
(916) 327-6775  
dd4@cpuc.ca.gov

Anand Durvasula  
Executive Division  
RM. 5130  
505 Van Ness Avenue  
San Francisco CA 94102 3298

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

CALABASAS CA 91302  
(818) 961-3001  
Douglass@EnergyAttorney.com

Michael Kramer  
DUCERA PARTNERS LLC  
499 PARK AVENUE, 16TH FLOOR  
NEW YORK NY 10022  
(212) 671-9750  
cpuc@DuceraPartners.com

Donald R. Allen  
Founding Partner, Counsel  
DUNCAN & ALLEN  
1730 RHODE ISLAND AVENUE, NW, SUITE 700  
WASHINGTON DC 20036  
(202) 289-8400  
DRA@DuncanAllen.com  
For: Citizens Transmission LLC

---

Fadi Daye  
Safety and Enforcement Division  
320 West 4th Street Suite 500  
Los Angeles CA 90013  
(213) 576-7017  
ffd@cpuc.ca.gov  
For: SED

Marianne Divina  
Administrative Law Judge Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 696-7307  
md9@cpuc.ca.gov

Tim G. Drew  
Public Advocates Office  
AREA 4-A  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-5618  
zap@cpuc.ca.gov

Jeffery D. Harris  
Attorney  
ELLISON SCHNEIDER HARRIS & DONLAN LLP  
2600 CAPITOL AVENUE, STE. 400  
SACRAMENTO CA 95816  
(916) 447-2166

(415) 703-2765  
ad1@cpuc.ca.gov

Rachel Jones  
EAST BAY MUNICIPAL UTILITY DISTRICT  
375 ELEVENTH STREET  
OAKLAND CA 94607  
(510) 287-0166  
Rachel.Jones@EBmud.com

Saji Thomas Pierce  
EAST BAY MUNICIPAL UTILITY DISTRICT  
375 11TH STREET  
OAKLAND CA 94607-4240  
(510) 287-2013  
Saji.Pierce@EBmud.com

Brett T. Kawakami  
EBMUD  
375 11TH STREET, STE. 200  
OAKLAND CA 94541  
(510) 287-1087  
Brett.Kawakami@EBmud.com

Brian S. Biering  
Attorney  
ELLISON SCHNEIDER HARRIS & DONAN LLP  
2600 CAPITOL AVE., STE. 400  
SACRAMENTO CA 95816-5931  
(916) 447-2166  
BSB@esLawFirm.com  
For: DATC Path 15, LLC

---

Andrew B. Brown  
ELLISON SCHNEIDER HARRIS & DONLAN LLP  
2600 CAPITOL AVENUE, STE. 400  
SACRAMENTO CA 95816  
(916) 447-2166  
abb@eslawfirm.com

Katherine Palmquist  
EXPONENT  
EMAIL ONLY  
EMAIL ONLY CA 00000  
kpalmquist@exponent.com

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

JDH@eslawfirm.com

Ronald Liebert  
Attorney  
ELLISON, SCHNEIDER HARRIS & DONLAN LLP  
2600 CAPITOL AVE., STE. 400  
SACRAMENTO CA 95816  
(916) 447-2166  
RL@esLawFirm.com  
For: Perimeter Solutions

---

Laura J. Manz  
Director  
ENERGY NAVIGANT  
35 IRON POINT CIRCLE, STE. 225  
FOLSOM CA 95630  
(858) 354-8333  
Laura.Manz@Navigant.com

Amanda Vanega  
EQ RESEARCH LLC  
1155 KILDAIRE FARM ROAD, SUITE 203  
CARY NC 27511  
(919) 825-3339  
AVanega@EQ-research.com

Blake Elder  
Policy Research Analyst  
EQ RESEARCH, LLC  
1155 KILDAIRE FARM ROAD, SUITE 202-203  
CARY NC 27511  
(919) 825-3339  
CPUCdockets@EQ-research.com

Ray Cruz  
Dir  
ERGONICA  
1107 FAIROAKS AVE., STE. 887  
SOUTH PASADENA CA 91030  
(213) 598-7430  
Ray.Cruz@Ergonica.com  
For: Ergonica

---

Julia Ende  
Energy Division  
300 Capitol Mall  
Sacramento CA 95814 4309  
(415) 703-1688  
je6@cpuc.ca.gov

Gary C. Ermann  
Safety Policy Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1429  
gce@cpuc.ca.gov

Jean Hawley  
Telecommunications Paralegal  
FRIEND, HUDAK & HARRIS, LLP  
THREE RAVINIA DRIVE, STE. 1700  
ATLANTA GA 30346-2131  
(770) 399-9500  
JHawley@FH2.com

Amy Warshauer  
Mgr - Gov'T & External Affairs  
FRONTIER COMMUNICATIONS  
1201 K STREET, SUITE 1980  
SACRAMENTO CA 95814  
(916) 683-7989  
Amy.Warshauer@ftr.com

Charlie Born  
FRONTIER COMMUNICATIONS  
1201 K STREET, STE. 1980  
SACRAMENTO CA 95814  
(916) 686-3570  
Charlie.Born@FTR.com

Arthur Fisher  
Public Advocates Office  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2056  
aei@cpuc.ca.gov

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

Masoud Foudeh  
Energy Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1244  
mf5@cpuc.ca.gov

Jonathan Frost  
Energy Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-5412  
jf6@cpuc.ca.gov

Brian T. Cragg  
Attorney  
GOODIN, MACBRIDE, SQUERI & DAY, LLP  
505 SANSOME STREET, SUITE 900  
SAN FRANCISCO CA 94111  
(415) 392-7900  
BCragg@GoodinMacBride.com

Michael B. Day  
Attorney  
GOODIN, MACBRIDE, SQUERI, DAY & LAMPREY,  
505 SANSOME ST., STE. 900  
SAN FRANCISCO CA 94111  
(315) 392-7900  
MDay@GoodinMacBride.com  
For: Trans-Elect NTD Path 15, LLC

---

Zoe Harrold  
GREEN POWER INSTITUTE  
2039 SHATTUCK AVE., STE. 402  
BERKELEY CA 94704  
ZHarrold@gmail.com

Marc Kolb  
GRID DEL SOL CONSULTING  
46 VISTA DEL SOL  
MILL VALLEY CA 94941  
(707) 385-1624  
delsolgrid@gmail.com

Asish Gautam  
Safety Policy Division  
RM. 4-44  
300 Capitol Mall  
Sacramento CA 95814 4309  
(916) 823-4834  
agt@cpuc.ca.gov

Elena Gekker  
Legal Division  
RM. 5137  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1642  
egk@cpuc.ca.gov

Pouneh Ghaffarian  
Legal Division  
RM. 5025  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1317  
pxg@cpuc.ca.gov

Daphne Goldberg  
Public Advocates Office  
RM. 4208  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1578  
dk4@cpuc.ca.gov

Alice L. Harron  
Ceo  
HARRON, LLC  
4016 EVERETT AVE.  
OAKLAND CA 94602  
(415) 420-5707  
AHarron@HarronLLC.com

Emily Lieban  
HOLLAND & KNIGHT LLP  
50 CALIFORNIA STREET, STE. 2800  
SAN FRANCISCO CA 94111  
(415) 743-6946  
emily.lieban@hklaw.com

Kevin J. Ashe  
Associate  
HOLLAND & KNIGHT LLP  
50 CALIFORNIA STREET, STE. 2800  
SAN FRANCISCO CA 94111  
(415) 743-6921  
Kevin.Ashe@HKLaw.com

Tara Kaushik  
Partner  
HOLLAND & KNIGHT LLP  
50 CALIFORNIA STREET, SUITE 2800  
SAN FRANCISCO CA 94111  
(415) 743-6924  
Tara.Kaushik@HKLaw.com

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

Marcos Mora  
Director Of Development  
HORIZON WEST TRANSMISSION  
EMAIL ONLY  
EMAIL ONLY AA 00000  
(561) 691-2162  
marcos.mora@nee.com

Scott Castro  
HORIZON WEST TRANSMISSION, LLC  
ONE POST STREET, SUITE 2550  
SAN FRANCISCO CA 94104  
(415) 318-5919  
scott.castro@nee.com  
For: (Formerly NextEra Energy Transmission, LLC)

---

Steven Greco  
Regulatory Affairs Analyst  
HORIZON WEST TRANSMISSION, LLC  
700 UNIVERSE BLVD  
JUNO BEACH FL 33407  
(561) 691-7481  
Steven.Greco@NextEraEnergy.com  
For: (Formerly NextEra Energy Transmission, LLC)

---

Tracy C. Davis  
Sr. Attorney  
HORIZON WEST TRANSMISSION, LLC  
5920 W. WILLIAM CANNON DR., BLDG. 2  
AUSTIN TX 78749  
(512) 236-3141  
Tracy.C.Davis@NextEraEnergy.com  
For: (formerly NextEra Energy Transmission, LLC)

---

Robert Haga  
Administrative Law Judge Division  
RM. 5006  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2538  
rwh@cpuc.ca.gov

Jessica T. Hecht  
Administrative Law Judge Division  
400 R Street  
Sacramento CA 95814 6200

Christopher Hogan  
Public Advocates Office  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2848  
ch6@cpuc.ca.gov

Tyler Holzschuh  
Public Advocates Office  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2717  
tyh@cpuc.ca.gov

Landis Marttila  
IBEW 1245  
30 ORANGE TREE CIRCLE  
VACAVILLE CA 95687  
(925) 285-9057  
LKM4@ibew1245.com

Curt Barry  
Sr Writer / Editor  
INSIDE WASHINGTON PUBLISHERS  
EMAIL ONLY  
EMAIL ONLY CA 00000  
(916) 449-6171  
CBarry@iwpnews.com

Craig Judson Mcbeth  
JUDSON INVESTMENTS LLC  
84 WEST PARK PLACE, 3RD FL.  
STAMFORD CT 06901  
(203) 343-0367  
CJM@JudsonLLC.com

Caroline Thomas Jacobs  
Wildfire Safety Division  
RM. 520  
300 Capitol Mall  
Sacramento CA 95814 4309  
(916) 894-5607  
ctj@cpuc.ca.gov

Buck B. Endemann  
Partner  
K&L GATES LLP  
4 EMBARCADERO CENTER, STE. 1200  
SAN FRANCISCO CA 94111

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

(415) 703-2027  
jhe@cpuc.ca.gov

(415) 882-8016  
Buck.Endemann@KLGates.com

Scott Dunbar  
Attorney  
KEYES & FOX LLP  
1580 LINCOLN STREET, STE. 880  
DENVER CO 80203  
(949) 525-6016  
SDunbar@KeyesFox.com

Tim Mason  
Policy Dir  
LARGE-SCALE SOLAR ASSOCIATION  
2501 PORTOLA WAY  
SACRAMENTO CA 95818  
(510) 812-1416  
Tim@LargeScaleSolar.org

Sheridan Pauker  
Partner  
KEYES & FOX LLP  
436 14TH STREET, SUITE 1305  
OAKLAND CA 94612  
(510) 314-8202  
SPauker@KeyesFox.com

Michael Brown  
Consultant  
LAW OFFICE OF MICHAEL BROWN  
EMAIL ONLY  
EMAIL ONLY CA 00000  
(415) 699-0261  
Michael@MBrownLaw.net  
For: Small Business Utility Advocates (SBUA)

---

Valerie Kao  
Administrative Law Judge Division  
RM. 5005  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1341  
vuk@cpuc.ca.gov

Leon Bloomfield  
Attorney  
LAW OFFICES OF LEON BLOOMFIELD  
1901 HARRISON STREET, SUITE 1400  
OAKLAND CA 94612  
(510) 625-8250  
lmb@wblaw.net

Jonathan Koltz  
Executive Division  
RM. 5035  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2760  
jk5@cpuc.ca.gov

C. Susie Berlin  
Attorney  
LAW OFFICES OF SUSIE BERLIN  
1346 THE ALAMEDA, SUITE 7-141  
SAN JOSE CA 95126  
(408) 778-8478  
Berlin@SusieBerlinLaw.com

Brian Korpics  
Executive Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-5219  
bk4@cpuc.ca.gov

Gerron Blackwell  
LIBERTY UTILITIES  
9750 WASHBURN ROAD  
DOWNEY CA 90241  
Gerron.Blackwell@LibertyUtilities.com

Jeffery A. Williams  
Superintendent - Codes & Ordinances  
L.A. DEPT OF WATER & POWER  
111 NORTH HOPE STREET, RM. 856

Greg Campbell  
LIBERTY UTILITIES  
9750 WASHBURN ROAD



\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

LOS ANGELES CA 90012  
(213) 367-2212  
Jeffery.Williams@ladwp.com

Shannon Eddy  
Exe Dir  
LARGE-SCALE SOLAR ASSOCIATION  
2501 PORTOLA WAY  
SACRAMENTO CA 95818  
(415) 819-4285  
eddyconsulting@gmail.com

DOWNEY CA 90241  
Greg.Campbell@LibertyUtilities.com

Annmarie Lett  
Coordinator - Rates & Reg Affairs  
LIBERTY UTILITIES (CALIFORNIA)  
9750 WASHBURN ROAD  
DOWNEY CA 90241  
(562) 319-4751  
AnnMarie.Lett@LibertyUtilities.com

Sharon Yang  
Dir - Legal Services  
LIBERTY UTILITIES (CALPECO ELECTRIC) LLC  
9750 WASHBURN ROAD  
DOWNEY CA 90241  
(562) 299-5120  
Sharon.Yang@LibertyUtilities.com  
For: Liberty Utilities (California)

---

Jamie Garcia  
LOS ANGELES DEPT OF WATER AND POWER  
11 N. HOPE ST. ROOM 856  
LOS ANGELES CA 90012  
(213) 367-2212  
jaime.garcia@ladwp.com

Jim Rainey  
Staff Writer  
LOS ANGELES TIMES  
EMAIL ONLY  
EMAIL ONLY CA 00000  
(213) 237-3395  
jim.rainey@LATimes.com

Jessie Crozier  
LUMINUS MANAGEMENT  
350 WEST 43RD APT 14F  
NEW YORK NY 10036  
(248) 252-0793  
utilitydockets@gmail.com

Diana L. Lee  
Legal Division  
RM. 4107  
505 Van Ness Avenue  
San Francisco CA 94102 3298

Joseph W. Mitchell, Ph.D  
M-BAR TECHNOLOGIES AND CONSULTING, LLC  
19412 KIMBALL VALLEY RD.  
RAMONA CA 92065  
(760) 703-7521  
JWMitchell@MBarTek.com

Steven Moss  
Partner  
M.CUBED  
296 LIBERTY STREET  
SAN FRANCISCO CA 94114  
(415) 643-9578  
steven@moss.net  
For: The Local Government Sustainable Energy Coalition

---

Alejandro Mendez  
MADISON AVENUE PARTNERS  
150 EAST 58TH STREET, 14TH FLOOR  
NEW YORK NY 10155  
(212) 702-8646  
AM@MadisonAvelp.com

Eli Samaha  
MADISON AVENUE PARTNERS  
150 E 58TH STREET, 14TH FLOOR  
NEW YORK NY 10155  
(212) 702-8648  
Eli@MadisonAvelp.com

Michael Callahan  
MARIN CLEAN ENERGY  
EMAIL ONLY  
EMAIL ONLY CA 00000  
mcallahan@mcecleanenergy.org

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

(415) 703-4342  
dil@cpuc.ca.gov

Aaron Louie  
Public Advocates Office  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 696-7316  
aar@cpuc.ca.gov

Chloe Lukins  
Public Advocates Office  
RM. 4102  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1637  
clu@cpuc.ca.gov

Christopher Moore  
Executive Division  
320 West 4th Street Suite 500  
Los Angeles CA 90013  
(213) 576-7095  
cm8@cpuc.ca.gov

Candace Morey  
Legal Division  
RM. 5031  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-3211  
cjm@cpuc.ca.gov

Lucy Morgans  
Public Advocates Office  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 696-7333  
lym@cpuc.ca.gov

April Mulqueen  
Executive Division  
RM. 5220  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1112  
am4@cpuc.ca.gov

Trina Horner

Stephen Keehn  
Mgr Of Energy Reg & Legislative Affairs  
MONTEREY BAY COMMUNITY POWER  
70 GARDEN COURT, SUITE 300  
MONTEREY CA 93940  
(831) 641-7222  
skeehn@mbcp.org

MRW & ASSOCIATES, LLC  
EMAIL ONLY  
EMAIL ONLY CA 00000  
(510) 834-1999  
MRW@MRWassoc.com

Karin Nguyen  
Safety and Enforcement Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2924  
kny@cpuc.ca.gov

Jay Barkman  
ORANGE COUNTY FIRE AUTHORITY  
1 FIRE AUTHORITY ROAD  
IRVINE CA 92602  
(714) 573-6048  
jaybarkman@ocfa.org

Jamie Ormond  
Executive Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1193  
jo2@cpuc.ca.gov

Case Coordination  
PACIFIC GAS AND ELECTRIC COMPANY  
PO BOX 770000; MC B23A  
SAN FRANCISCO CA 94177  
(415) 973-6593  
RegRelcpucCases@pge.com

Charles R. Middlekauff  
PACIFIC GAS AND ELECTRIC COMPANY  
77 BEALE STREET, B30A / BOX 7442

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

Director  
NAVIGANT CONSULTING  
101 CALIFORNIA STREET, STE. 4100  
SAN FRANCISCO CA 94111  
(415) 399-2107  
Trina.Horner@Navigant.com

Edwin Guyandi  
Analyst  
NEWTYN MANAGEMENT  
405 PARK AVENUE, SUITE 1104  
NEW YORK NY 10022  
(212) 446-2477  
Edwin@Newtyn.com

James W. Carson  
Attorney At Law  
NIELSEN MERKSAMER PARRINELLO  
2350 KERNER BLVD., STE250  
SAN RAFAEL CA 94901  
(415) 389-6800  
jcarson@nmgovlaw.com

SAN FRANCISCO CA 94105  
(415) 973-6971  
Charles.Middlekauff@pge.com

Gareth Stamp  
PACIFIC GAS AND ELECTRIC COMPANY  
245 MARKET STREET, ROOM 914C  
SAN FRANCISCO CA 94105  
GRSL@pge.com

Jessica Basilio, Esq.  
Attorney  
PACIFIC GAS AND ELECTRIC COMPANY  
77 BEALE STREET, B30A  
SAN FRANCISCO CA 94105  
(415) 973-5548  
Jessica.Basilio@pge.com

Julie Cerio  
PACIFIC GAS AND ELECTRIC COMPANY  
77 BEALE ST., RM. 2388B  
SAN FRANCISCO CA 94104  
(415) 973-2079  
JQCH@pge.com

Lise H. Jordan  
Attorney At Law  
PACIFIC GAS AND ELECTRIC COMPANY  
77 BEALE STREET, B30A  
SAN FRANCISCO CA 94105  
(415) 973-6965  
LHJ2@pge.com

William V. Manheim  
Attorney At Law  
PACIFIC GAS AND ELECTRIC COMPANY  
PO BOX 770000, MAIL CODE B30A  
SAN FRANCISCO CA 94177  
(415) 973-6628  
WVM3@pge.com

Meghan Dewey  
Mgr - Ee Policy / Strategy  
PACIFIC GAS AND ELECTRIC COMPANY  
EMAIL ONLY  
EMAIL ONLY CA 00000  
(415) 973-1805  
Meghan.Dewey@pge.com

Heide Marie Caswell  
PACIFICORP  
825 NE MULTNOMAH, STE. 1700  
PORTLAND OR 97232  
(503) 813-6216  
Heide.Caswell@PacifiCorp.com

Meredith Allen  
Sr. Director, Regulatory Relations  
PACIFIC GAS AND ELECTRIC COMPANY  
77 BEALE STREET, B10C  
SAN FRANCISCO CA 94105  
(415) 973-2868  
MEAe@pge.com

Jessica Buno Ralston  
Sr. Attorney  
PACIFICORP  
825 NE MULTNOMAH, SUITE 2000  
PORTLAND OR 97232  
(503) 813-5817  
Jessica.Ralston@PacifiCorp.com

Spencer Olinek

Pooja Kishore  
Mgr - Regulatory Affairs

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

PACIFIC GAS AND ELECTRIC COMPANY  
77 BEALE STREET, ROOM 2333  
SAN FRANCISCO CA 94105  
(415) 973-5540  
WSO3@pge.com

Tracy Maratukulam  
PACIFIC GAS AND ELECTRIC COMPANY  
245 MARKET STREET, ROOM 903  
SAN FRANCISCO CA 94105  
(415) 973-3638  
TDM9@pge.com

Viktoriya Malkina  
Coordinator - Regulatory  
PACIFIC GAS AND ELECTRIC COMPANY  
77 BEALE STREET, MC B23A  
SAN FRANCISCO CA 94105  
(415) 973-1818  
V2M4@pge.com

Wade A. Greenacre  
Case Mgr.  
PACIFIC GAS AND ELECTRIC COMPANY  
EMAIL ONLY  
EMAIL ONLY CA 00000  
(415) 973-8098  
wag9@pge.com

Nori Yokozuka  
General Counsel  
PERIMETER SOLUTIONS  
8000 MARYLAND AVE., SUITE 350  
CLAYTON MO 63105  
(314) 396-7314  
Noriko.Yokozuka@perimeter-solutions.com

James W. Mctarnaghan  
Attorney  
PERKINS COIE LLP  
505 HOWARD STREET, STE. 1000  
SAN FRANCISCO CA 94105  
(415) 344-7007  
ServiceList.cpuc@PerkinsCoie.com

Monica Palmeira  
Executive Division  
RM. 3-90

PACIFICORP  
825 NE MULTNOMAH STREET, SUITE 2000  
PORTLAND OR 97232  
(503) 813-7314  
CaliforniaDockets@PacifiCorp.com

Timothy K. Clark  
PACIFICORP (ROCKY MOUNTAIN POWER)  
1407 WEST NORTH TEMPLE, SUITE 320  
SALT LAKE CITY UT 84116  
(801) 220-4565  
Tim.Clark@pacificorp.com

Doug Karpa  
Sr Analyst - Regulatory  
PENINSULA CLEAN ENERGY  
2075 WOODSIDE ROAD  
REDWOOD CITY CA 94061  
(650) 771-9093  
DKarpa@PeninsulaCleanEnergy.com

Joseph F. Wiedman  
Dir - Regulatory & Legislative Affairs  
PENINSULA CLEAN ENERGY AUTHORITY  
2075 WOODSIDE ROAD  
REDWOOD CITY CA 94061  
(650) 265-0083  
JWiedman@PeninsulaCleanEnergy.com

Quang Pham  
Safety and Enforcement Division  
AREA 2-D  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-4763  
qap@cpuc.ca.gov

Filiberto A. Pineda  
Executive Division  
300 Capitol Mall  
Sacramento CA 95814 4309  
(916) 823-4778  
fil@cpuc.ca.gov

Elizabeth Podolinsky  
Safety and Enforcement Division  
RM. 5216  
505 Van Ness Avenue

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1268  
mp8@cpuc.ca.gov

Leslie L. Palmer  
Safety and Enforcement Division  
RM. 2203  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2369  
llp@cpuc.ca.gov  
For: SED

Christopher Parkes  
Public Advocates Office  
AREA 2-D  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1975  
cjp@cpuc.ca.gov

Bryan Pena  
Safety and Enforcement Division  
320 West 4th Street Suite 500  
Los Angeles CA 90013  
(213) 620-2680  
bp1@cpuc.ca.gov

Joceline Pereira  
Safety and Enforcement Division  
320 West 4th Street Suite 500  
Los Angeles CA 90013  
(213) 266-4720  
jcn@cpuc.ca.gov

Nick Williams  
Senior Distressed Debt Analyst  
REORG RESEARCH INC.  
EMAIL ONLY  
EMAIL ONLY NY 00000  
(646) 862-2577  
NWilliams@reorg.com

Sue Mara  
Consultant  
RTO ADVISORS, L.L.C.  
164 SPRINGDALE WAY  
REDWOOD CITY CA 94062

San Francisco CA 94102 3298  
(415) 703-3201  
pod@cpuc.ca.gov

Nathan Poon  
Administrative Law Judge Division  
RM. 5013  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2751  
np2@cpuc.ca.gov

Jim Ross  
RCS, INC.  
266 PENNINGTON LANE  
CHESTERFIELD MO 63005  
(314) 530-9544  
JimRoss@r-c-s-inc.com

Allie Detrio  
REIMAGINE POWER  
77 SALA TERRACE  
SAN FRANCISCO CA 94112  
(415) 825-0133  
Allie@Reimagine-Power.com

Conor Skelding  
Reporter  
REORG  
11 E 26TH STREET, 12TH FL.  
NEW YORK NY 10010  
(646) 390-5733  
CSkelding@Reorg.com

Central Files  
SAN DIEGO GAS & ELECTRIC COMPANY  
8330 CENTURY PARK CT, CP31-E  
SAN DIEGO CA 92123-1530  
(858) 654-1240  
CentralFiles@SempraUtilities.com

Christopher M. Lyons  
Sr. Counsel  
SAN DIEGO GAS & ELECTRIC COMPANY  
8326 CENTURY PARK COURT, CP32D  
SAN DIEGO CA 92123  
(858) 654-1559

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

(415) 902-4108  
Sue.Mara@RTOadvisors.com

Junaid Rahman  
Safety Policy Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-3372  
jnr@cpuc.ca.gov

James Ralph  
Executive Division  
RM. 5037  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-4673  
jr8@cpuc.ca.gov

Jonathan J. Reiger  
Legal Division  
RM. 4107  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 355-5596  
jzr@cpuc.ca.gov

Colin Rizzo  
Administrative Law Judge Division  
RM. 5042  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1784  
cr2@cpuc.ca.gov

Joy Mastache  
Sr. Attorney - Off. Of Gen. Counsel  
SACRAMENTO MUNICIPAL UTILITY DISTRICT  
6201 S STREET, MS B406  
SACRAMENTO CA 95817  
(916) 732-5906  
Joy.Mastache@smud.org

Ilana Parmer Mandelbaum  
Deputy County Counsel  
SAN MATEO COUNTY COUNSEL'S OFFICE  
400 COUNTY CENTER, 6TH FLOOR  
REDWOOD CITY CA 94063  
(650) 363-4681  
imandelbaum@smcgov.org

CLyons@sdge.com

Chuck Manzuk  
Dir - Grc & Revenue Requirements  
SAN DIEGO GAS & ELECTRIC COMPANY  
8330 CENTURY PARK COURT  
SAN DIEGO CA 92123  
(858) 654-1782  
CManzuk@SempraUtilities.com

Jamie K. York  
Grc Program Mgr.  
SAN DIEGO GAS & ELECTRIC COMPANY  
8330 CENTURY PARK COURT, CP32D  
SAN DIEGO CA 92123  
(858) 654-1739  
JYork@SempraUtilities.com

Norma Jasso  
Mgr - Regulatory  
SAN DIEGO GAS & ELECTRIC COMPANY  
8330 CENTURY PARK CT, CP31E  
SAN DIEGO CA 92123  
(858) 654-3535  
NJasso@SempraUtilities.com

SAN DIEGO GAS AND ELECTRIC COMPANY  
8330 CENTURY PARK COURT (CP31E)  
SAN DIEGO CA 92123-1548  
(858) 654-1240  
CentralFiles@SempraUtilities.com

Ross Nakasone  
Planning & Regulatory Compliance  
SAN FRANCISCO PUBLIC UTILITIES COMMISSION  
525 GOLDEN GATE AVE., 7TH FL.  
SAN FRANCISCO CA 94102  
(415) 554-2436  
RNakasone@SFwater.org

Connor Flannigan  
SOUTHERN CALIFORNIA EDISON COMPANY  
2244 WALNUT GROVE AVE.  
ROSEMEAD CA 91770  
connor.flanigan@sce.com

Gary Stern

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

Phillip Muller  
President  
SCD ENERGY SOLUTIONS  
436 NOVA ALBION WAY  
SAN RAFAEL CA 94903  
(415) 479-1710  
PhilM@SCDenergy.com

William Chung  
Vice President Business Development  
SHARPER SHAPE  
1080 NIMITZ AVE SUITE 200  
VALLEJO CA 94592  
(714) 423-1799  
will.chung@sharppershape.com

Kerri Timmer  
SIERRA BUISNESS COUNCIL  
10183 TRUCKEE AIRPORT RD  
TRUCKEE CA 96161  
(530) 414-8247  
KTimmer@sierrabusiness.org

Ariel Strauss  
SMALL BUSINESS UTILITY ADVOCATES  
548 MARKET ST., SUITE 11200  
SAN FRANCISCO CA 94104  
(310) 709-1213  
ariel@utilityadvocates.org

Audra Hartmann  
Principal  
SMITH, WATTS & HARTMANN  
925 L STREET, SUITE 220  
SACRAMENTO CA 95814  
(916) 446-5508  
AHartmann@SWMconsult.com

Case Administration  
SOUTHERN CALIFORNIA EDISON COMPANY  
8631 RUSH STREET  
ROSEMEAD CA 91770  
(626) 302-6906  
Case.Admin@sce.com

Managing Dir.  
SOUTHERN CALIFORNIA EDISON COMPANY  
8631 RUSH STREET  
ROSEMEAD CA 91770  
(626) 302-6904  
Gary.Stern@sce.com  
For: Southern California Edison Company

---

Laura Genao  
Dir. - Cpuc Regulatory Affairs  
SOUTHERN CALIFORNIA EDISON COMPANY  
601 VAN NESS AVE., STE. 2030  
SAN FRANCISCO CA 94102  
(626) 302-3062  
Laura.Genao@sce.com

Margarita Gevondyan  
Sr. Attorney  
SOUTHERN CALIFORNIA EDISON COMPANY  
2244 WALNUT GROVE AVE / PO BOX 800  
ROSEMEAD CA 91770  
(626) 302-6931  
Margarita.Gevondyan@sce.com  
For: Southern California Edison Company

---

Ryan Stevenson  
Principal Advisor / Reg - Policy  
SOUTHERN CALIFORNIA EDISON COMPANY  
8631 RUSH ST., GEN. OFFICE 4  
ROSEMEAD CA 91770  
Ryan.Stevenson@sce.com

Corky Whipple  
SOUTHWIRE COMPANY, LLC  
1 SOUTHWIRE DRIVE  
CARROLLTON GA 30119  
(770) 832-5550  
corky.whipple@southwire.com

Laura McWilliams  
STATE SENATOR JERRY HILL  
STATE CAPITOL, ROOM 5035  
SACRAMENTO CA 95814  
(916) 651-4013  
Laura.McWilliams@sen.ca.gov

\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

Melissa K. Semcer  
Wildfire Safety Division  
RM. 522  
400 R Street  
Sacramento CA 95814 6200  
(916) 823-4773  
unc@cpuc.ca.gov

Sean A. Simon  
Executive Division  
RM. 5201  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-3791  
svn@cpuc.ca.gov

Nathaniel Skinner  
Public Advocates Office  
AREA 4-A  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1393  
nws@cpuc.ca.gov

Joyce Steingass  
Energy Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1810  
jws@cpuc.ca.gov

Katherine J. Stockton  
Executive Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1711  
kjs@cpuc.ca.gov

Eric Borden  
Energy Policy Analyst  
THE UTILITY REFORM NETWORK  
785 MARKET STREET, STE. 1400  
SAN FRANCISCO CA 94103  
(415) 929-8876 X320  
EBorden@turn.org

Katy Morsony  
Staff Attorney  
THE UTILITY REFORM NETWORK  
785 MARKET STREET, SUITE 1400  
SAN FRANCISCO CA 94103  
(415) 929-8876 X313  
KMorsony@turn.org

Marcel Hawiger  
Staff Attorney  
THE UTILITY REFORM NETWORK  
785 MARKET ST., STE. 1400  
SAN FRANCISCO CA 94103  
(415) 929-8876 X311  
Marcel@turn.org

Robert Finkelstein  
General Counsel  
THE UTILITY REFORM NETWORK  
785 MARKET ST., STE. 1400  
SAN FRANCISCO CA 94103  
(415) 929-8876 X-307  
BFinkelstein@turn.org

Jane E. Terjung  
Community Advocates  
TOPANGA COMMUNITY ALLIANCE  
1639 OAK DRIVE  
TOPANGA CA 90290  
(310) 488-8779  
JaneTerjung@gmail.com

Charlotte TerKeurst  
Safety and Enforcement Division  
RM. 2201  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-3124  
cft@cpuc.ca.gov  
For: SED

Leuwam Tesfai  
Executive Division  
RM. 5137  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2403  
lt3@cpuc.ca.gov

Sarah R. Thomas  
Administrative Law Judge Division  
RM. 5033  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2310  
srt@cpuc.ca.gov

Koko M. Tomassian  
Wildfire Safety Division  
320 West 4th Street Suite 500  
Los Angeles CA 90013  
(213) 576-7099  
kmt@cpuc.ca.gov



\*\*\*\*\***SERVICELIST**\*\*\*\*\*  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

For: SED

Rick Tse  
Safety and Enforcement Division  
AREA 2-D  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 355-5581  
rkt@cpuc.ca.gov

Kavya Balaraman  
Reporter  
UTILITY DIVE  
EMAIL ONLY  
EMAIL ONLY DC 00000  
Kavya@UtilityDive.com

Ricardo Vega  
EMAIL ONLY  
EMAIL ONLY CA 00000  
ricardo.vega@nexteraenergy.com

Jane Whang  
Staff Counsel  
VERIZON  
201 SPEAR STREET, 7TH FL.  
SAN FRANCISCO CA 94105  
(415) 778-1022  
Jane.Whang@Verizon.com

Jesus G. Roman  
Assist. Gen. Counsel  
VERIZON  
15505 SAND CANYON AVE. D201  
IRVINE CA 92618  
(949) 286-7202  
jesus.g.roman@verizon.com

Rebecca M. Vorpe  
Legal Division  
RM. 3206  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-4443  
rv2@cpuc.ca.gov

Lon W. House, Ph.D  
WATER & ENERGY CONSULTING  
10645 N. ORACLE RD., STE 121-216  
ORO VALLEY AZ 85737  
(530) 676-8956

John W. Hamilton  
Associate Attorney  
WINSTON & STRAWN LLP  
101 CALIFORNIA ST., 35TH FL.  
SAN FRANCISCO CA 94111  
(415) 591-1000  
JWHamilton@Winston.com

Joan Weber  
Safety Policy Division  
RM. 5TH  
320 West 4th Street Suite 500  
Los Angeles CA 90013  
(213) 266-4729  
jw8@cpuc.ca.gov  
For: OSA

Fred G. Yanney, Esq.  
Attorney  
YANNEY LAW OFFICE  
17409 MARQUARDT AVE. STE. C-4  
CERRITOS CA 90703  
(562) 926-5050  
FredYanney@gmail.com

Anna Yang  
Public Advocates Office  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-2144  
ayn@cpuc.ca.gov

Amy C. Yip-Kikugawa  
Legal Division  
RM. 4107  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-5256  
ayk@cpuc.ca.gov

Matthew Yunge  
Safety and Enforcement Division  
505 Van Ness Avenue  
San Francisco CA 94102 3298  
(415) 703-1667  
myu@cpuc.ca.gov

**\*\*\*\*\* SERVICELIST \*\*\*\*\***  
**Last Updated on 07-MAY-2020 by: AMT**  
**R1810007LIST**

lwhouse@innercite.com

## **APPENDIX A**

### **Deficiencies and Conditions**

<b>Guidance-1</b>	<b>Lack of risk spend efficiency (RSE) information</b>
<b>Class</b>	B
<b>Deficiency</b>	2020 WMP submissions contain sparse and sporadic detail regarding the RSE of WMP initiatives. RSE calculations are critical for determining whether utilities are effectively allocating resources to initiatives that provide the greatest risk reduction benefits per dollar spent, thus ensuring responsible use of ratepayer funds. Although RSE concepts have been considered for several years through Commission GRCs, utilities still display unrefined and limited abilities to produce such information. Considering that utilities propose to spend billions of dollars on WMP initiatives, not having quantifiable information on how those initiatives reduce utility ignition risk relative to their cost severely limits the WSD's ability to evaluate the efficacy of such initiatives and each utility's portfolio of initiatives, as outlined in 2020 WMPs.
<b>Condition</b>	In its first quarterly report, each electrical corporation shall provide the following: <ul style="list-style-type: none"> <li>i. its calculated reduction in ignition risk for each initiative in its 2020 WMP;</li> <li>ii. its calculated reduction in wildfire consequence risk for each initiative in its 2020 WMP;</li> <li>and</li> <li>iii. the risk models used to calculate (i) and (ii) above.</li> </ul>

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

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

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

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



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

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

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

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

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

<b>Guidance-11</b>	<b>Lack of detail on plans to address personnel shortages</b>
<b>Class</b>	B
<b>Deficiency</b>	Electrical corporations do not explain in detail the range of activities that they are undertaking to recruit and train personnel to grow the overall pool of talent in areas of personnel shortage.
<b>Condition</b>	<p>In its first quarterly report, each electrical corporation shall detail:</p> <ul style="list-style-type: none"> <li>i. a listing and description of its programs for recruitment and training of personnel, including for vegetation management;</li> <li>ii. a description of its strategy for direct recruiting and indirect recruiting via contractors and subcontractors; and</li> <li>iii. its metrics to track the effectiveness of its recruiting programs, including metrics to track the percentage of recruits that are newly trained, percentage from out of state, and the percentage that were working for another California utility immediately prior to being hired.</li> </ul>

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

**(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 10<sup>th</sup>, 2020. Data is pulled from Tables 1-31 of Utility WMPs unless stated otherwise.

By utility, the WMPs referenced in this document are:

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

All are available at [cpuc.ca.gov/wildfiremitigationplans](http://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

<b>1.1 WILDFIRE RISK EXPOSURE .....</b>	<b>B6</b>
FIGURE 1.1A: COMPARISON OF DATA SOURCES FOR CIRCUIT TYPOLOGIES.....	B6
FIGURE 1.1B: CIRCUIT TOPOLOGY BREAKDOWN BY OVERHEAD AND UNDERGROUND CIRCUIT MILES .....	B7
FIGURE 1.2A: OVERHEAD CIRCUIT MILES BY HFTD TIER (LARGE UTILITIES) .....	B8
FIGURE 1.2B: OVERHEAD CIRCUIT MILES BY HFTD TIER (SMALL UTILITIES) .....	B9
FIGURE 1.3A: BREAKDOWN OF OVERHEAD TRANSMISSION AND DISTRIBUTION CIRCUIT MILES BY HFTD AND WUI LOCATION (LARGE UTILITIES).....	B10
FIGURE 1.3B: BREAKDOWN OF OVERHEAD TRANSMISSION AND DISTRIBUTION CIRCUIT MILES BY HFTD AND WUI LOCATION (SMALL UTILITIES).....	B11
FIGURE 1.4A: BREAKDOWN OF OVERHEAD TRANSMISSION AND DISTRIBUTION CIRCUIT MILES BY HFTD AND POPULATION DENSITY (LARGE UTILITIES) .....	B12
FIGURE 1.4B: BREAKDOWN OF OVERHEAD TRANSMISSION AND DISTRIBUTION CIRCUIT MILES BY HFTD AND POPULATION DENSITY (SMALL UTILITIES).....	B13
FIGURE 1.5A: RED FLAG WARNING CIRCUIT MILE DAYS PER YEAR BY UTILITY (LARGE UTILITIES) .....	B14
FIGURE 1.5B: RED FLAG WARNING CIRCUIT MILE DAYS PER YEAR BY UTILITY (SMALL UTILITIES).....	B15
FIGURE 1.5C: 95 <sup>TH</sup> AND 99 <sup>TH</sup> PERCENTILE WIND CONDITIONS (LARGE UTILITIES) .....	B16
FIGURE 1.5D: 95 <sup>TH</sup> AND 99 <sup>TH</sup> PERCENTILE WIND CONDITIONS (SMALL UTILITIES).....	B17
 <b>1.2 OUTCOME METRICS.....</b>	<b>B18</b>
FIGURE 2.1A: ASSET INSPECTION FINDINGS NORMALIZED BY TOTAL CIRCUIT MILEAGE (LARGE UTILITIES) .....	B18
FIGURE 2.1B: ASSET INSPECTION FINDINGS NORMALIZED BY TOTAL CIRCUIT MILEAGE (SMALL UTILITIES) .....	B19
FIGURE 2.2A: NEAR MISS INCIDENTS NORMALIZED BY OVERHEAD CIRCUIT MILEAGE (LARGE UTILITIES) .....	B20
FIGURE 2.2B: NEAR MISS INCIDENTS NORMALIZED BY OVERHEAD CIRCUIT MILEAGE (SMALL UTILITIES).....	B21
FIGURE 2.3A: NUMBER OF IGNITIONS, NORMALIZED BY OVERHEAD CIRCUIT MILEAGE (LARGE UTILITIES) .....	B22
FIGURE 2.3B: NUMBER OF IGNITIONS, NORMALIZED BY OVERHEAD CIRCUIT MILEAGE (SMALL UTILITIES).....	B23

FIGURE 2.4A: TOTAL IGNITIONS BY HFTD LOCATION (LARGE UTILITIES).....	B24
FIGURE 2.4B: TOTAL IGNITIONS BY HFTD LOCATION (SMALL UTILITIES) .....	B25
FIGURE 2.5A: IGNITIONS BY IGNITION PROBABILITY DRIVER TYPE (LARGE UTILITIES) .....	B26
FIGURE 2.5B: IGNITIONS BY IGNITION PROBABILITY DRIVER TYPE (SMALL UTILITIES) .....	B27
FIGURE 2.6A: DETAIL: SHARE OF IGNITIONS DUE TO EACH IGNITION PROBABILITY DRIVER (LARGE UTILITIES) .....	B28
FIGURE 2.6B: DETAIL: SHARE OF IGNITIONS DUE TO EACH IGNITION PROBABILITY DRIVER (SMALL UTILITIES) .....	B29
FIGURE 2.7A: ACTUAL AND PROJECTED IGNITIONS FOR TOP IGNITION DRIVERS, 2019 AND 2022 .....	B30
FIGURE 2.7B: PG&E DETAIL: ACTUAL AND PROJECTED IGNITIONS FOR TOP IGNITION DRIVERS, 2019 AND 2022.....	B31
FIGURE 2.7C: SCE DETAIL: ACTUAL AND PROJECTED IGNITIONS FOR TOP IGNITION DRIVERS, 2019 AND 2022 .....	B32
FIGURE 2.8A: NORMALIZED PSPS DURATION IN CUSTOMER HOURS (LARGE UTILITIES).....	B33
FIGURE 2.8B: NORMALIZED PSPS DURATION IN CUSTOMER HOURS (SMALL UTILITIES) .....	B34
FIGURE 2.8C: PSPS IMPACTS ON CRITICAL INFRASTRUCTURE .....	B35
FIGURE 2.9A: NORMALIZED AREA BURNED BY UTILITY IGNITED WILDFIRE (LARGE UTILITIES) .....	B36
FIGURE 2.9B: NORMALIZED AREA BURNED BY UTILITY IGNITED WILDFIRE (SMALL UTILITIES) .....	B37
FIGURE 2.10: NUMBER OF STRUCTURES DAMAGED BY UTILITY IGNITED WILDFIRE .....	B38
FIGURE 2.11: FATALITIES DUE TO UTILITY IGNITED WILDFIRE .....	B39

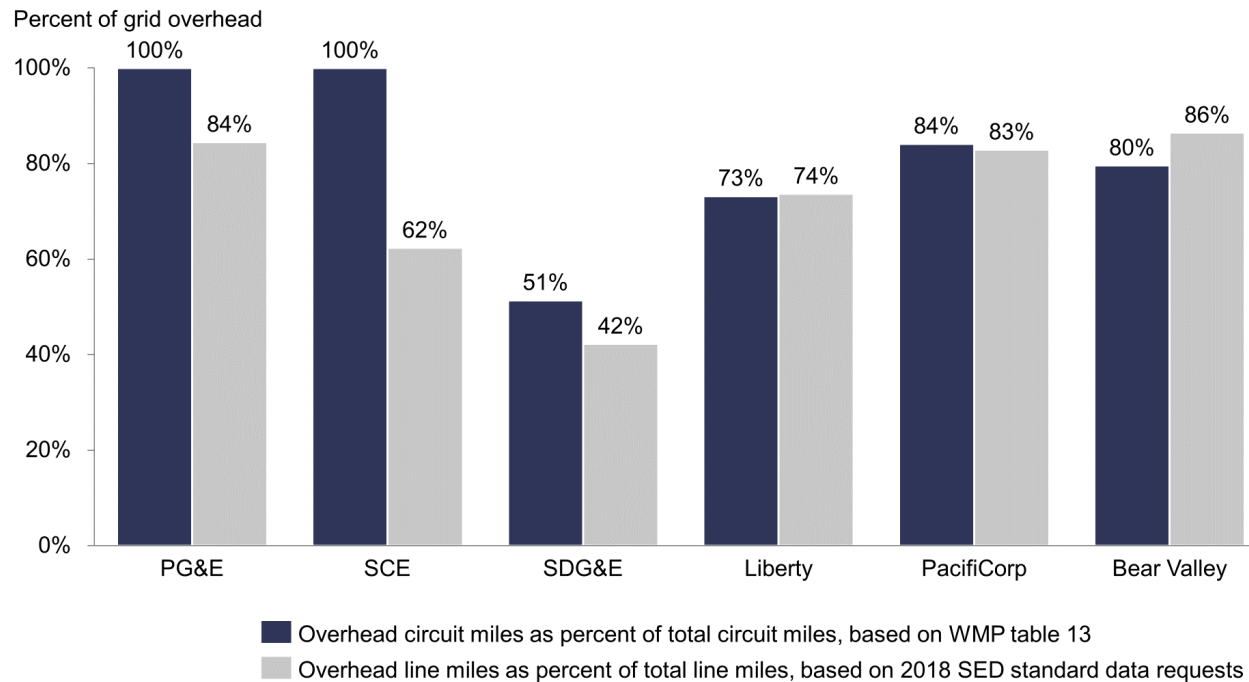
### **1.3 RESOURCE ALLOCATION..... B40**

FIGURE 3.1A: OVERVIEW OF TOTAL PLAN SPEND ACROSS UTILITIES (LARGE UTILITIES) .....	B40
FIGURE 3.1B: OVERVIEW OF TOTAL PLAN SPEND ACROSS UTILITIES (SMALL UTILITIES) .....	B41
FIGURE 3.2A: OVERVIEW OF TOTAL PLAN SPEND ACROSS UTILITIES (LARGE UTILITIES) .....	B42
FIGURE 3.2B: OVERVIEW OF TOTAL PLAN SPEND ACROSS UTILITIES (SMALL UTILITIES) .....	B43
FIGURE 3.3A: BREAKDOWN OF PLANNED SPEND BY CATEGORY (LARGE UTILITIES) .....	B44
FIGURE 3.3B: BREAKDOWN OF PLANNED SPEND BY CATEGORY (SMALL UTILITIES) .....	B45
FIGURE 3.4A: PG&E RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND .....	B46
FIGURE 3.4B: PG&E RESOURCE ALLOCATION DETAIL FOR TOP 4 CATEGORIES BY PLANNED SPEND.....	B47
FIGURE 3.5A: SCE RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND .....	B48
FIGURE 3.5B: SCE RESOURCE ALLOCATION DETAIL FOR TOP 4 CATEGORIES BY PLANNED SPEND .....	B49
FIGURE 3.6A: SDG&E RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND.....	B50

FIGURE 3.6B: SDG&E RESOURCE ALLOCATION DETAIL FOR TOP 4 CATEGORIES BY PLANNED SPEND .....	B51
FIGURE 3.7: LIBERTY RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND .....	B52
FIGURE 3.8: PACIFICORP RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND .....	B53
FIGURE 3.9: BEAR VALLEY RESOURCE ALLOCATION DETAIL FOR TOP 5 INITIATIVES BY PLANNED SPEND.....	B54
FIGURE 3.10: HORIZON WEST TRANSMISSION ALLOCATION DETAIL FOR ALL PLANNED INITIATIVES .....	B55

## 1.1 Wildfire Risk Exposure

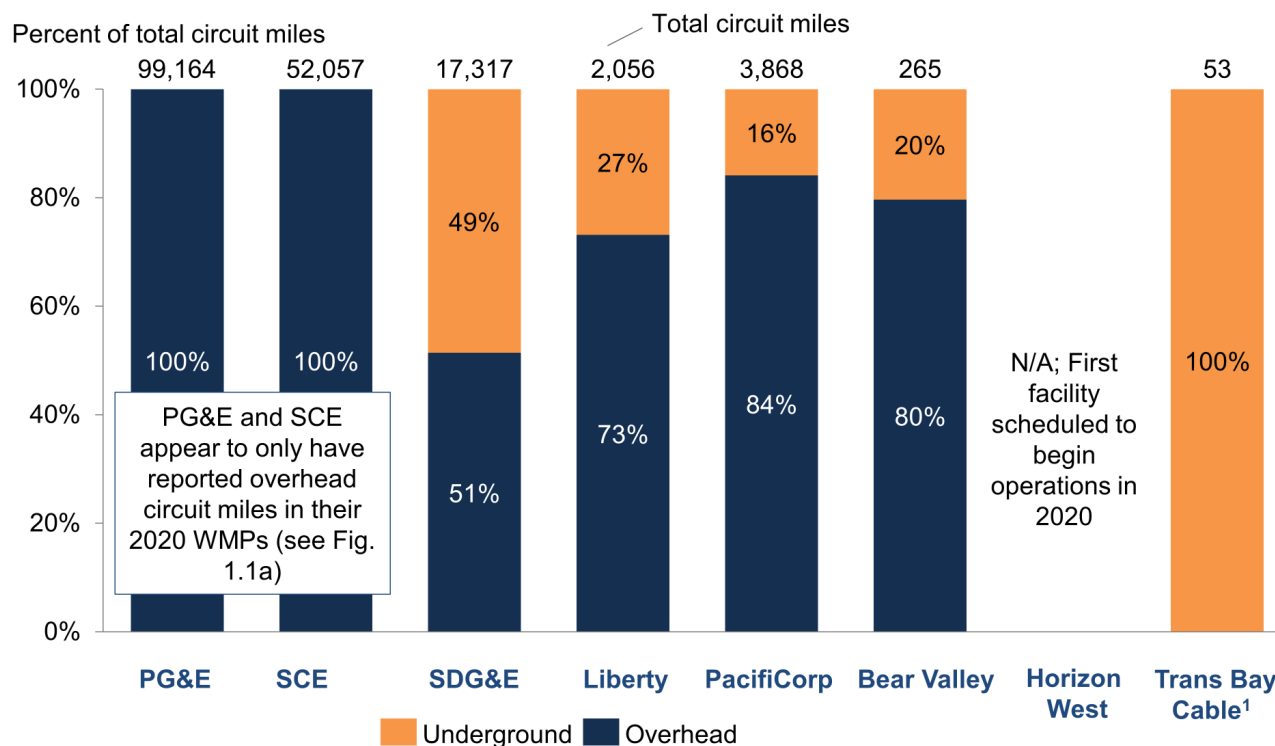
Figure 1.1a: Comparison of data sources for circuit typologies



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

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

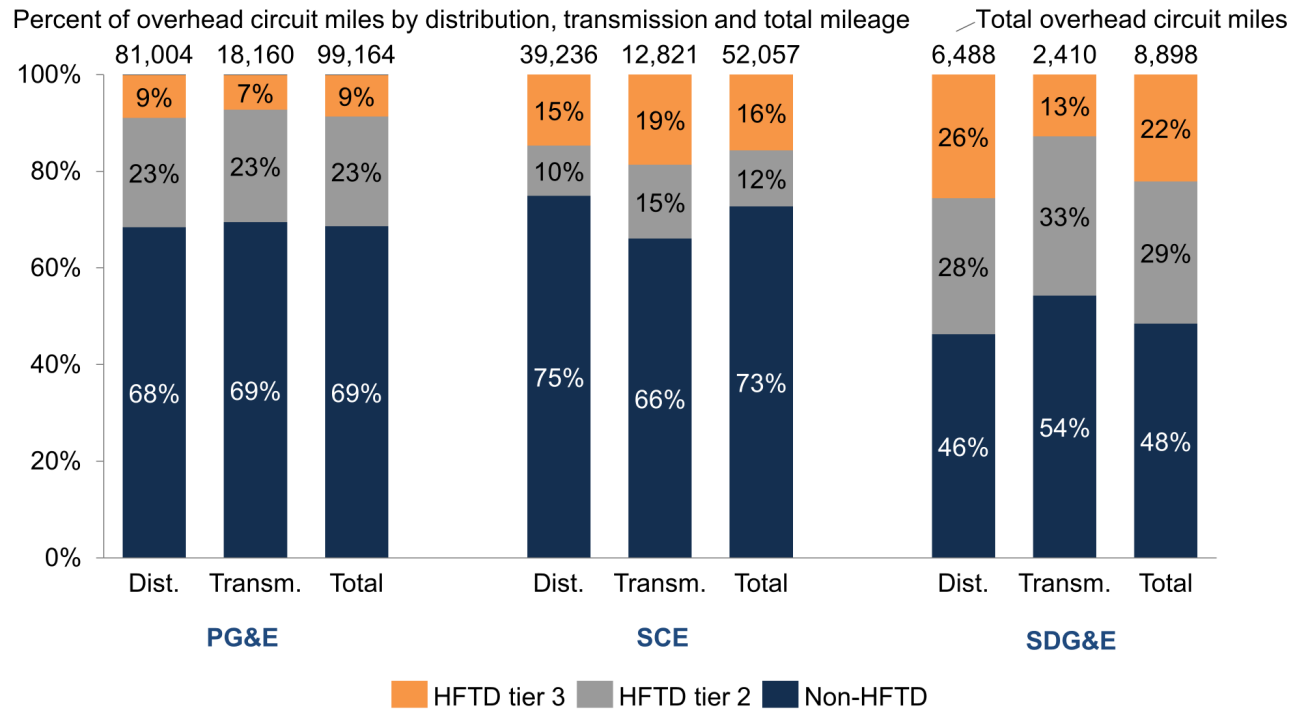
Figure 1.1b: Circuit topology breakdown by overhead and underground circuit miles



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.)*

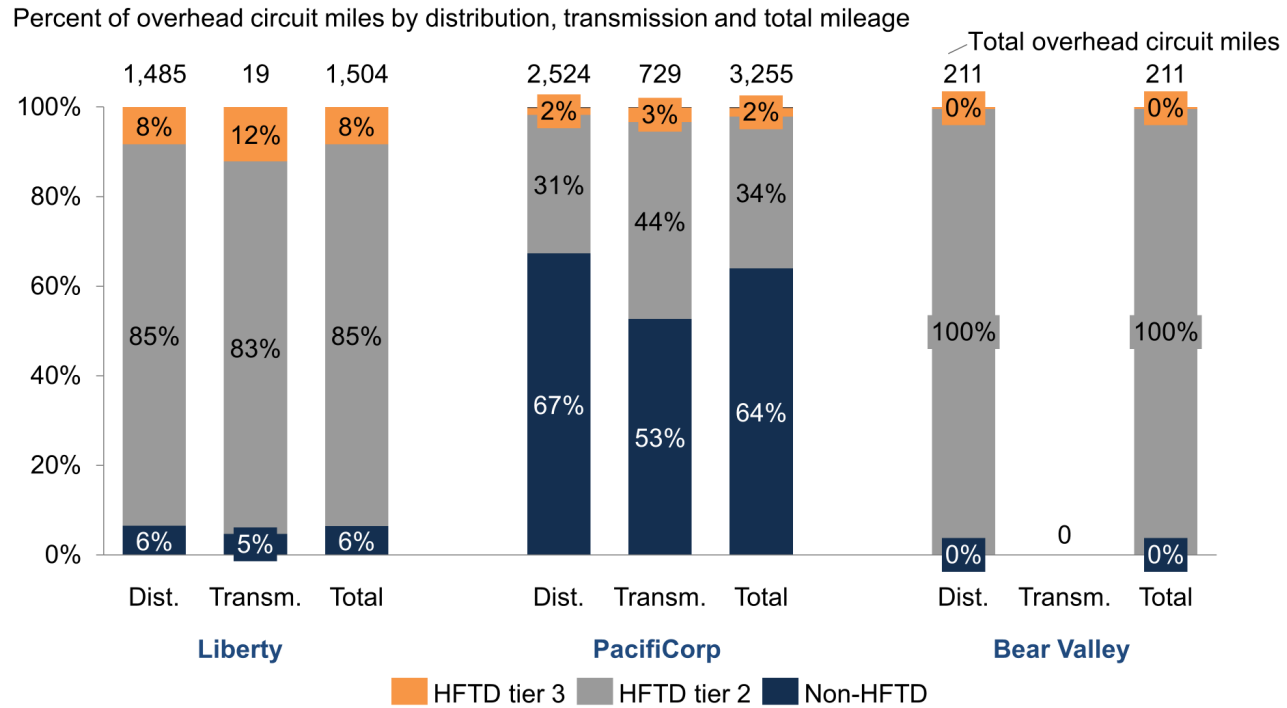


Note: Zone 1 not shown as subtotal.

Source: WMP Table 13



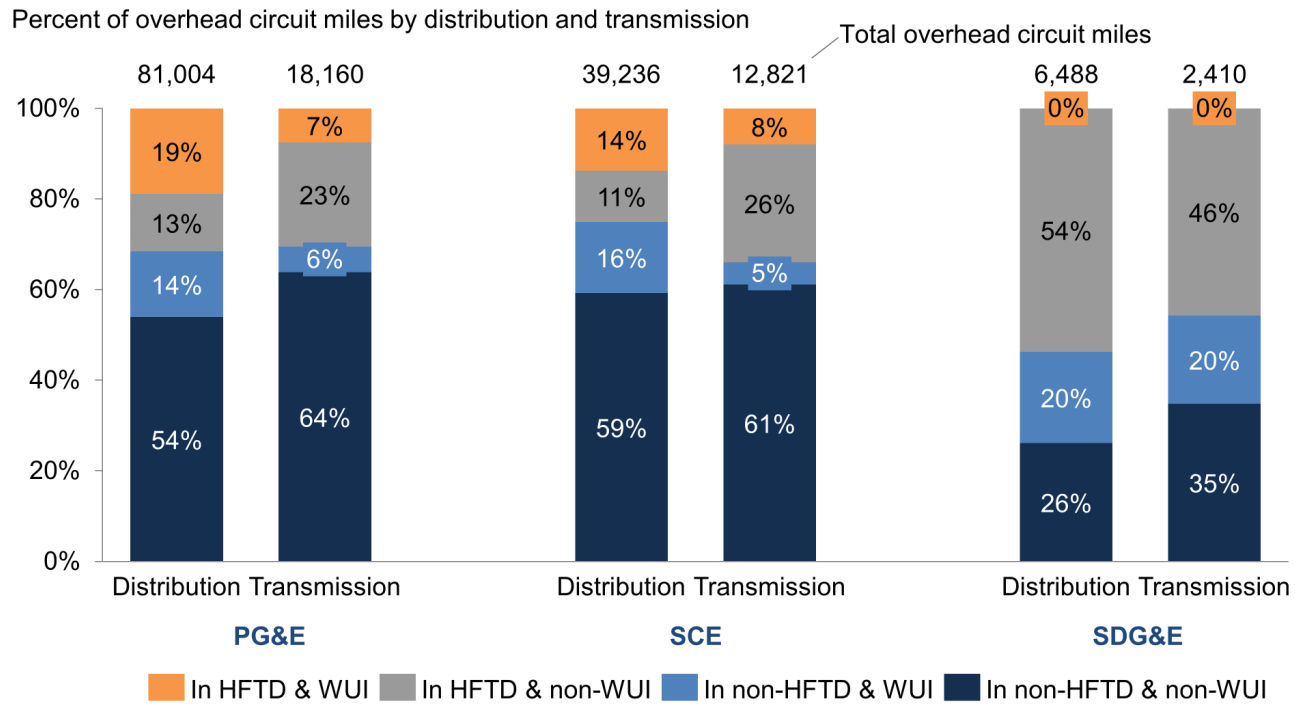
Figure 1.2b: Overhead circuit miles by HFTD Tier (Small Utilities)  
*Broken out by distribution (dist.) and transmission (transm.)*



Note: Zone 1 not shown as subtotal.

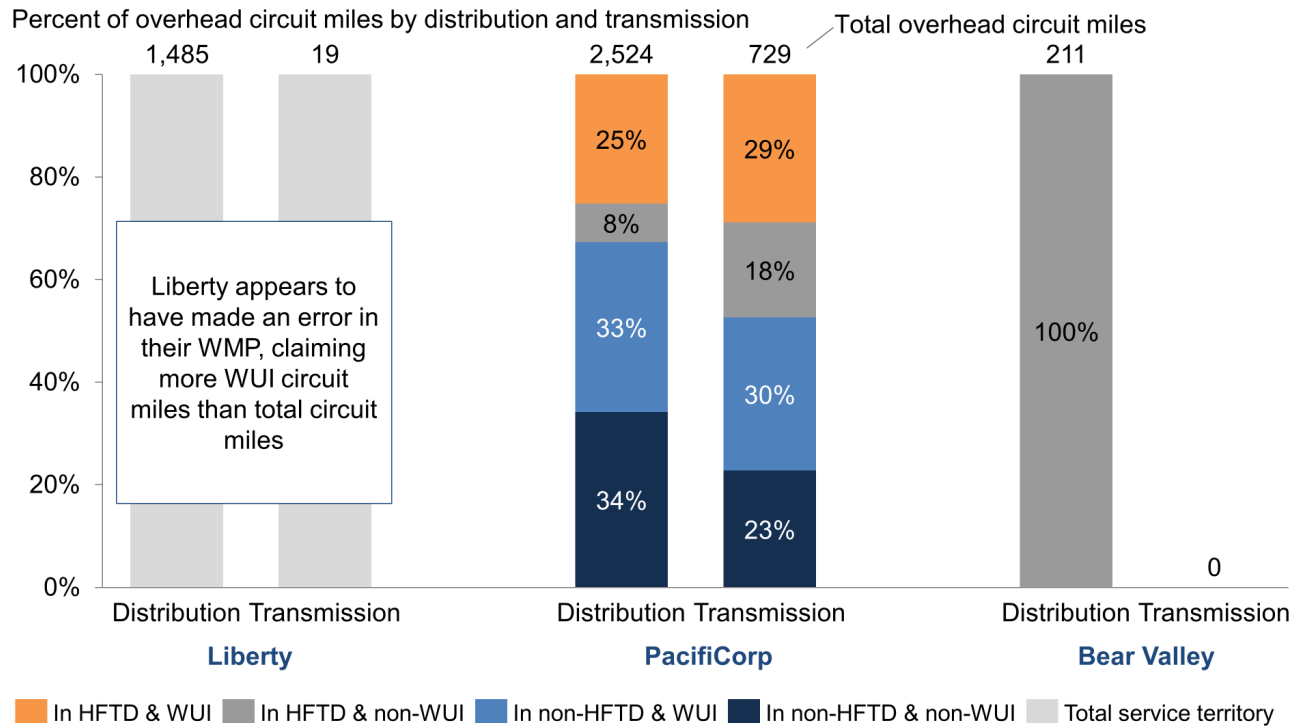
Source: WMP Table 13

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



Source: WMP Table 13

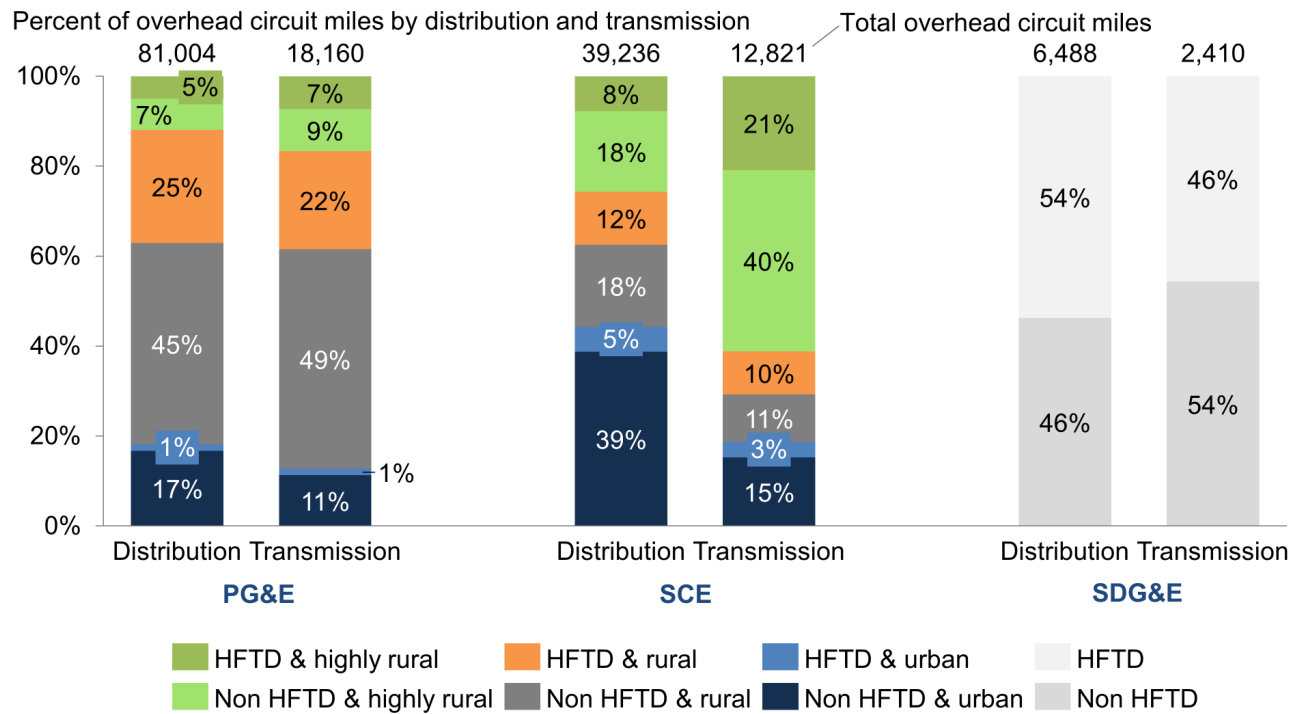
Figure 1.3b: Breakdown of overhead transmission and distribution circuit miles by HFTD and WUI location (Small utilities)



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

Source: WMP Table 13

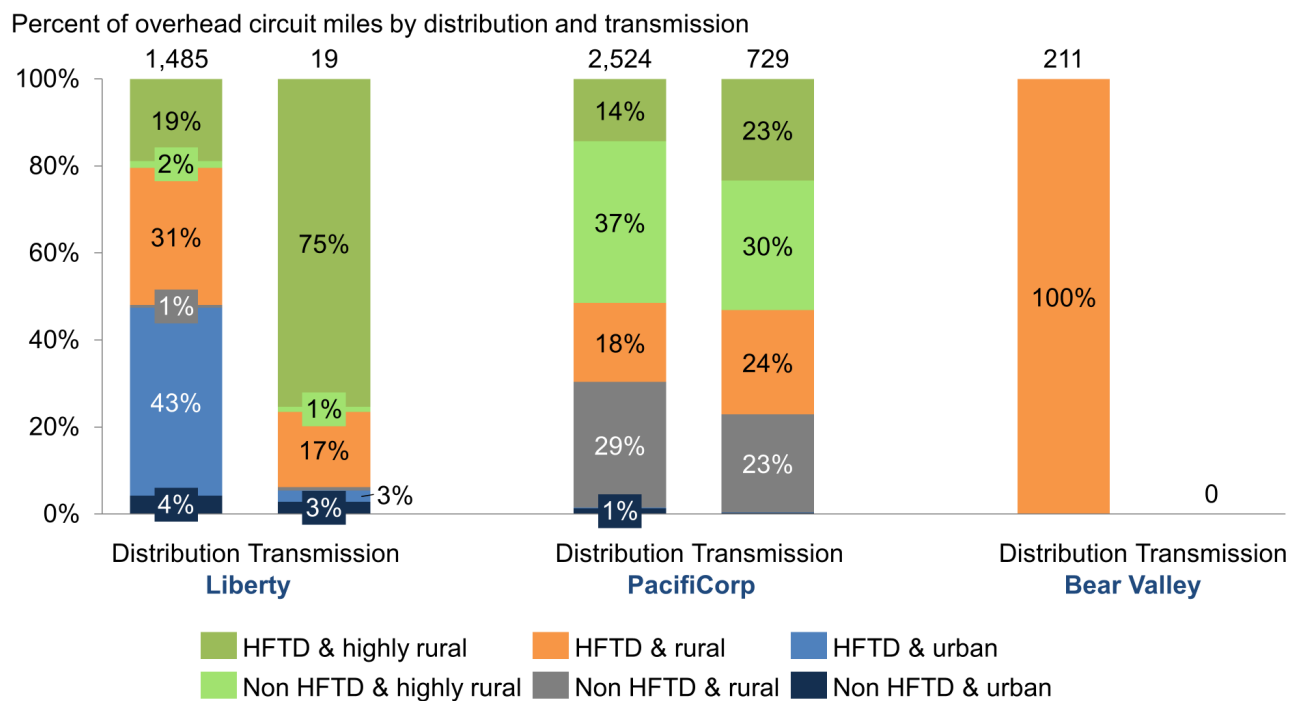
Figure 1.4a: Breakdown of overhead transmission and distribution circuit miles by HFTD and population density (Large utilities)



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

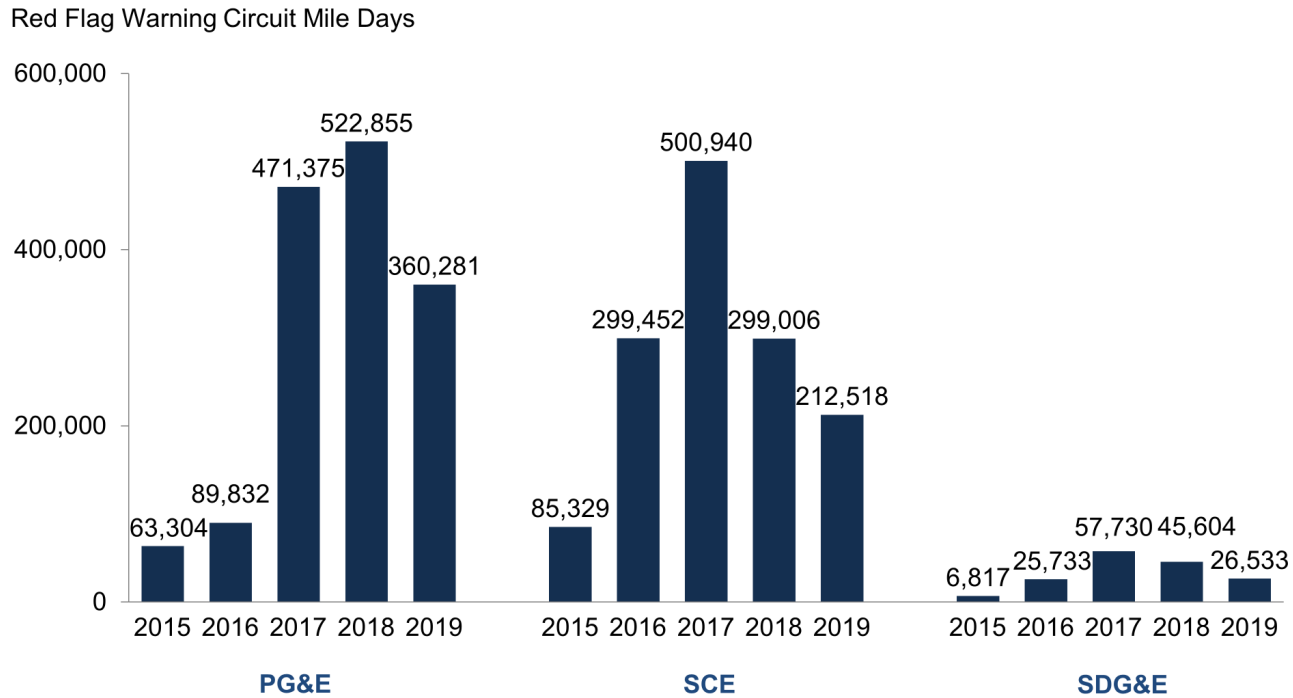
Source: WMP Table 13

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



Source: WMP Table 13

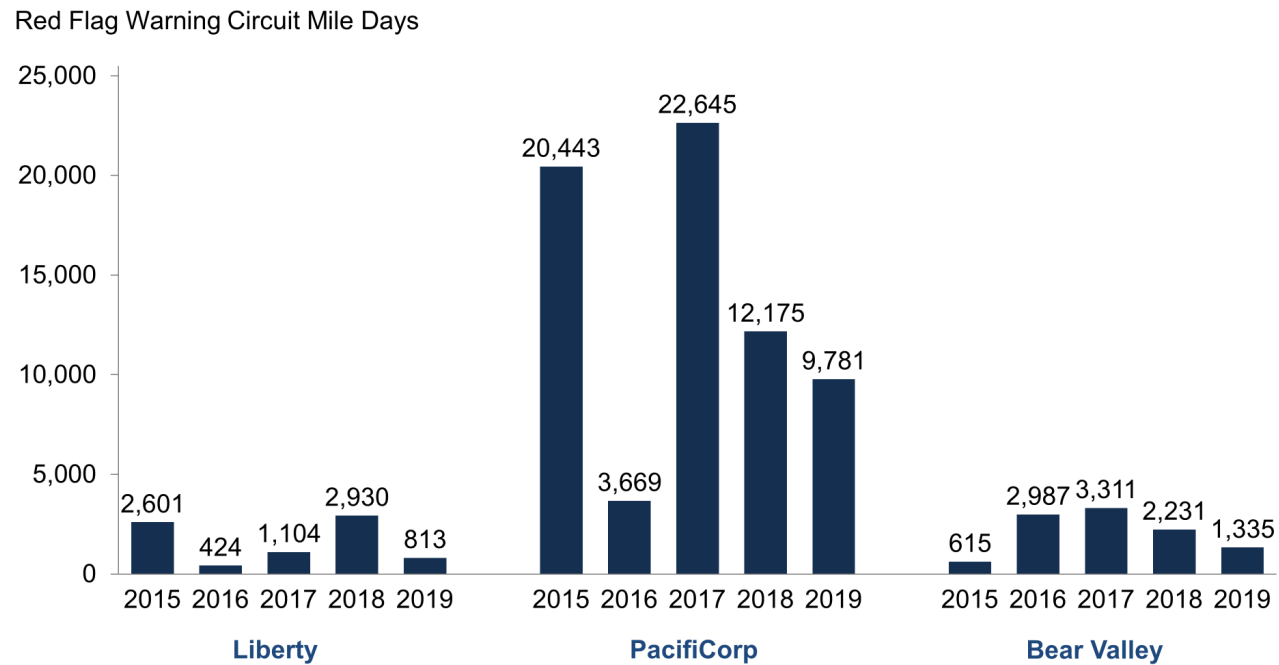
Figure 1.5a: Red flag warning circuit mile days per year by utility (Large utilities)



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

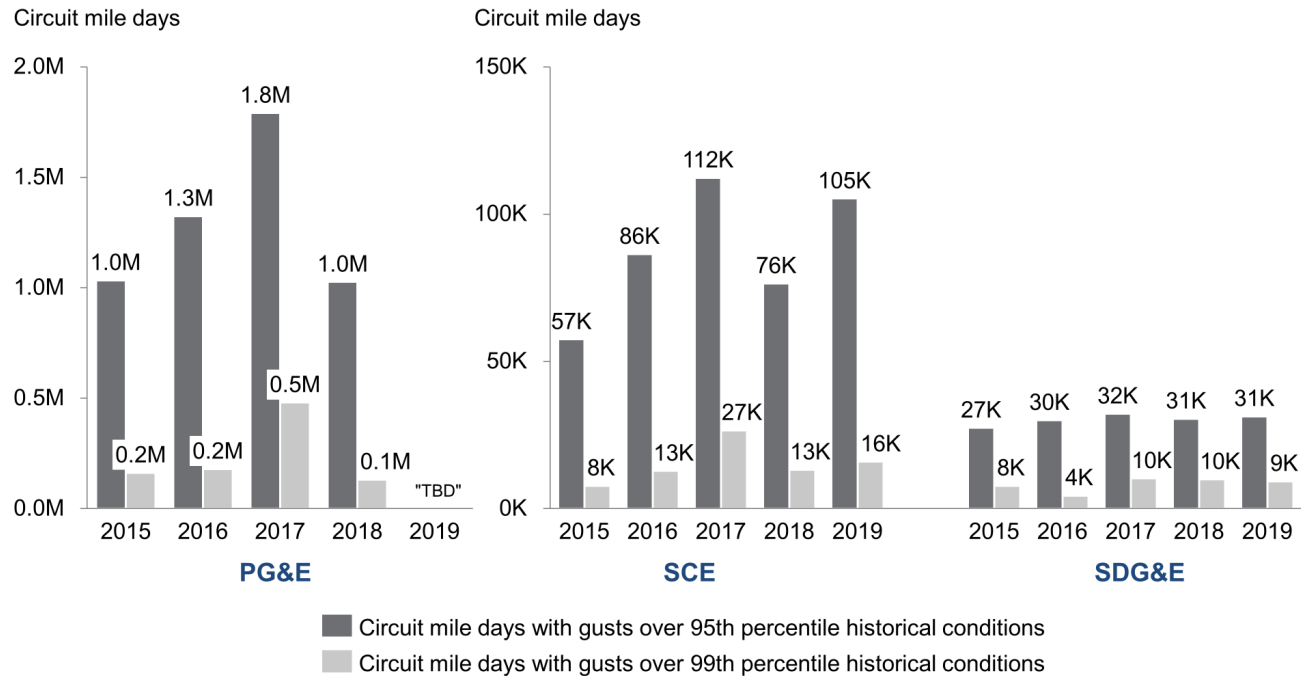
Figure 1.5b: Red flag warning circuit mile days per year by utility (Small utilities)



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: 95<sup>th</sup> and 99<sup>th</sup> percentile wind conditions (Large utilities)

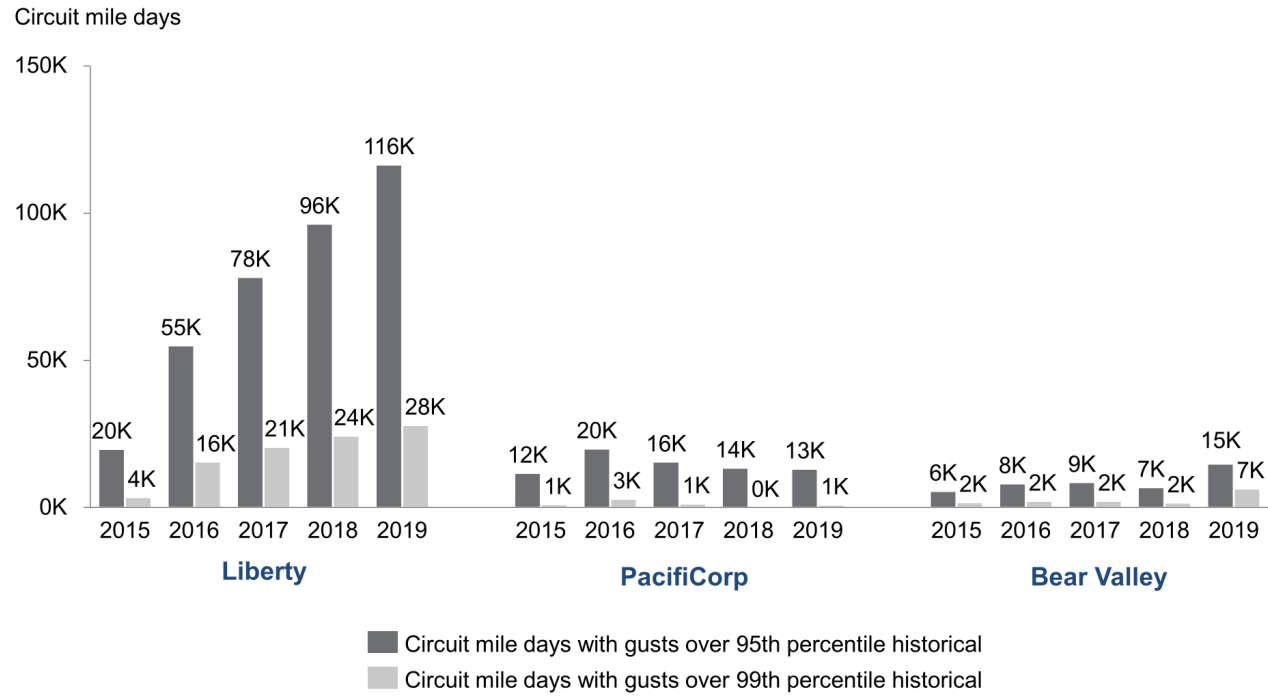


Note: Utilities were directed to report historical conditions as conditions over 10 prior years, 2005-2014. SCE appears to have instead reported historical conditions over the 5 prior years, 2009-2014, thus using a different baseline to calculate 95<sup>th</sup> and 99<sup>th</sup> percentile wind speeds. 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: 95<sup>th</sup> and 99<sup>th</sup> percentile wind conditions (Small utilities)



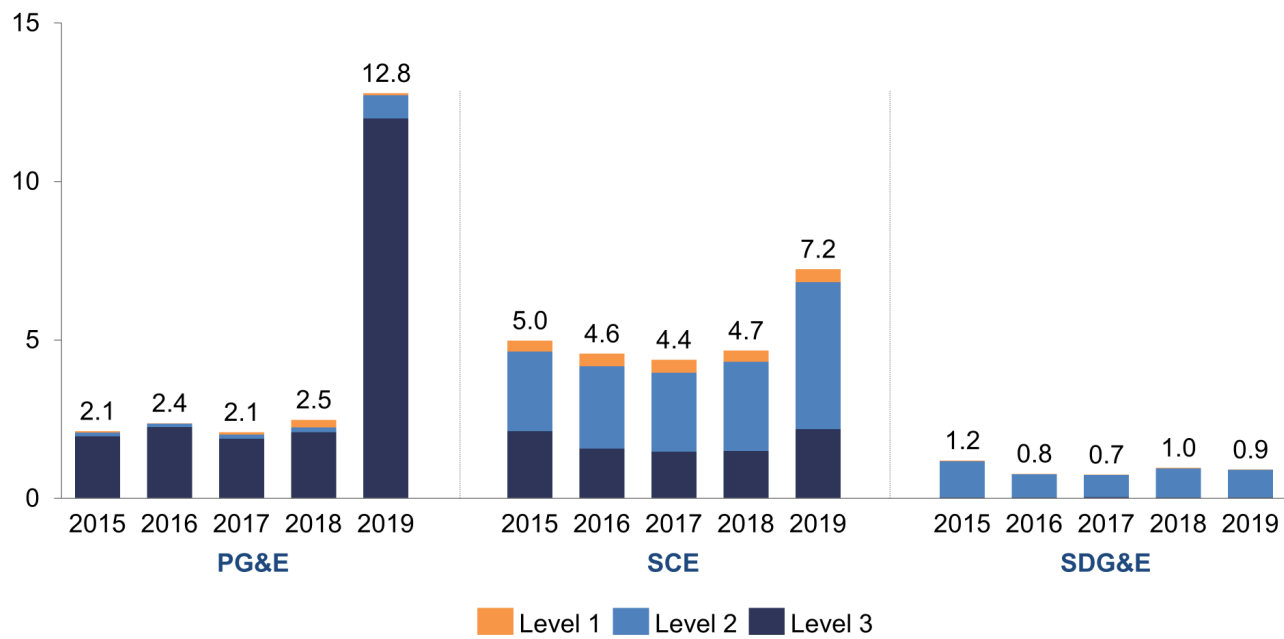
Note: Historical conditions refer to conditions over 10 prior years, 2005-2014.

Source: WMP Table 10

## 1.2 Outcome Metrics

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

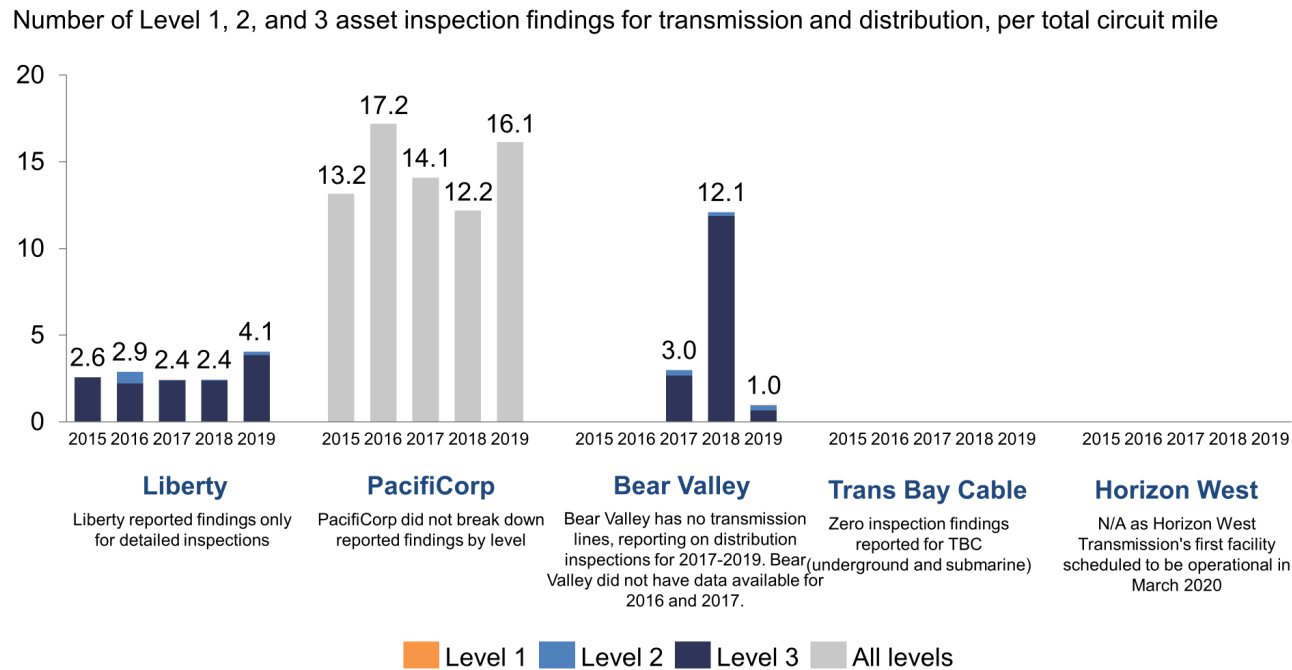
Number of Level 1, 2, and 3 asset inspection findings for transmission and distribution, per total circuit mile



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

Source: WMP Table 1

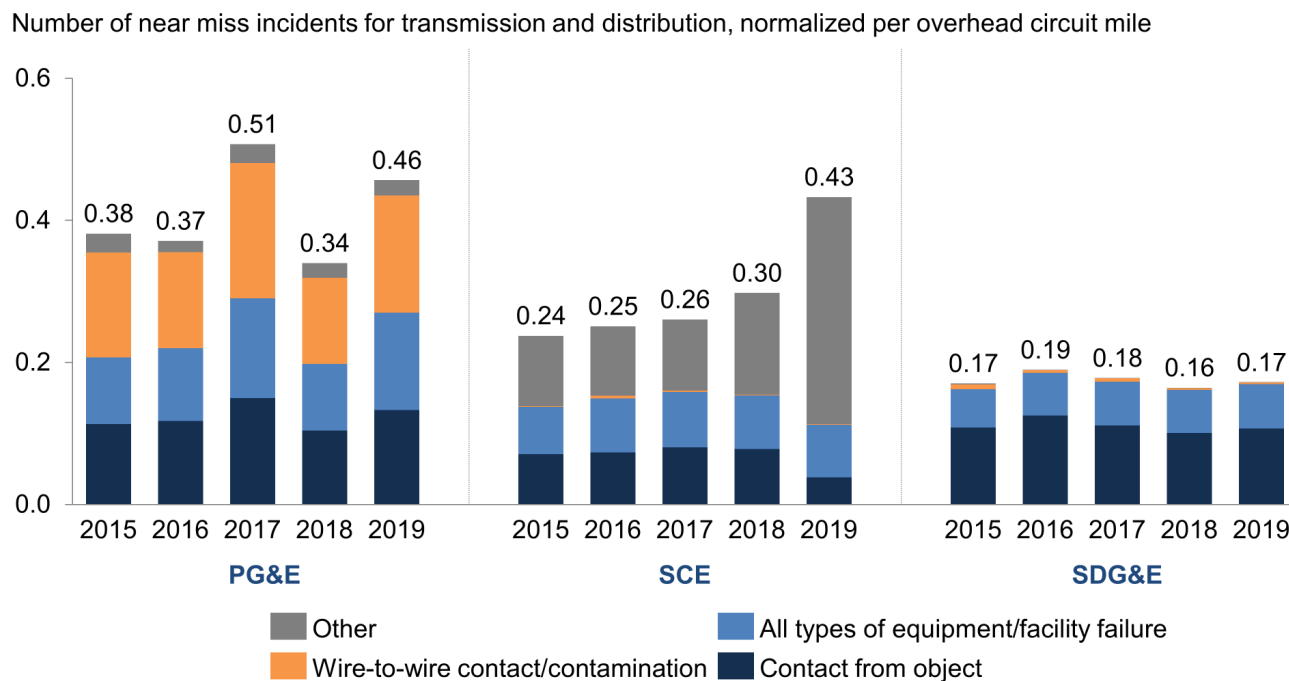
Figure 2.1b: Asset inspection findings normalized by total circuit mileage (Small utilities)



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

Source: WMP Table 1

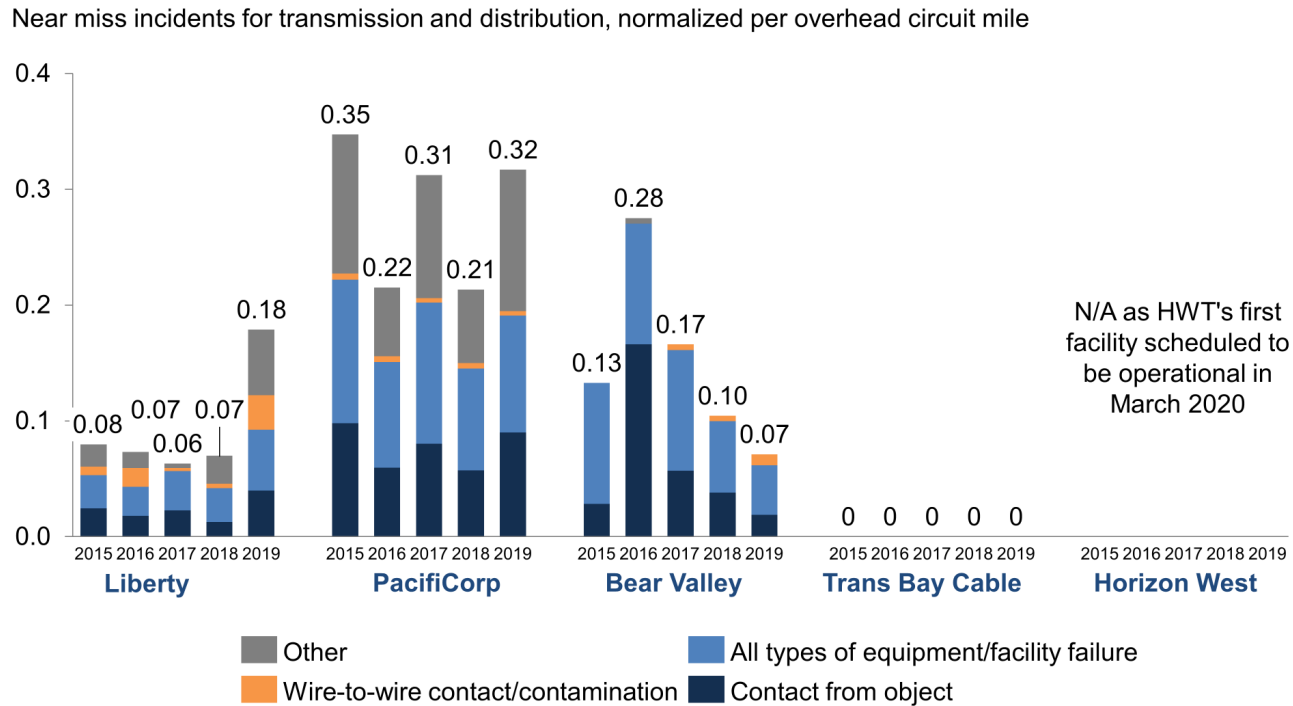
Figure 2.2a: Near miss incidents normalized by overhead circuit mileage (Large utilities)



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)

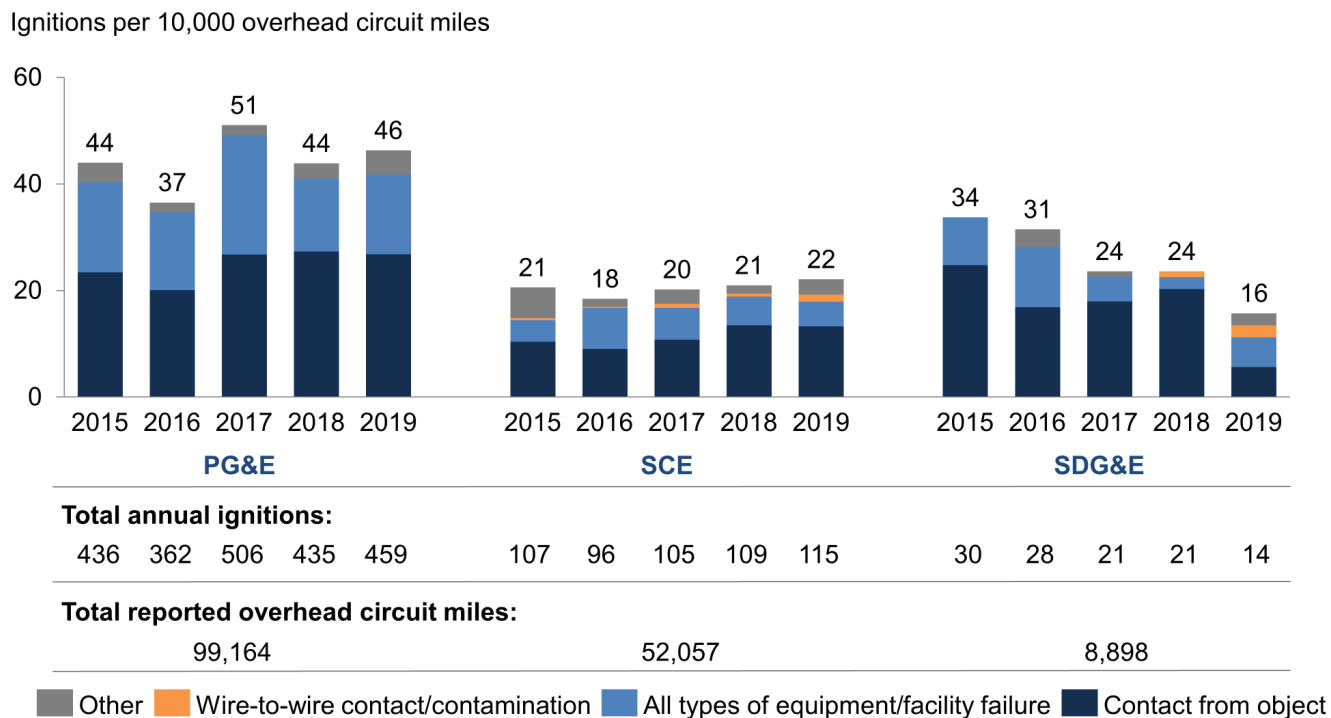


Note: The measurement of each 'near miss' is not yet perfectly standardized across utilities. The WSD will work toward a more standardized approach for tracking and classifying near miss data for 2021 WMPs. A near miss was defined in the 2020 WMP Guidelines as "An event with significant probability of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

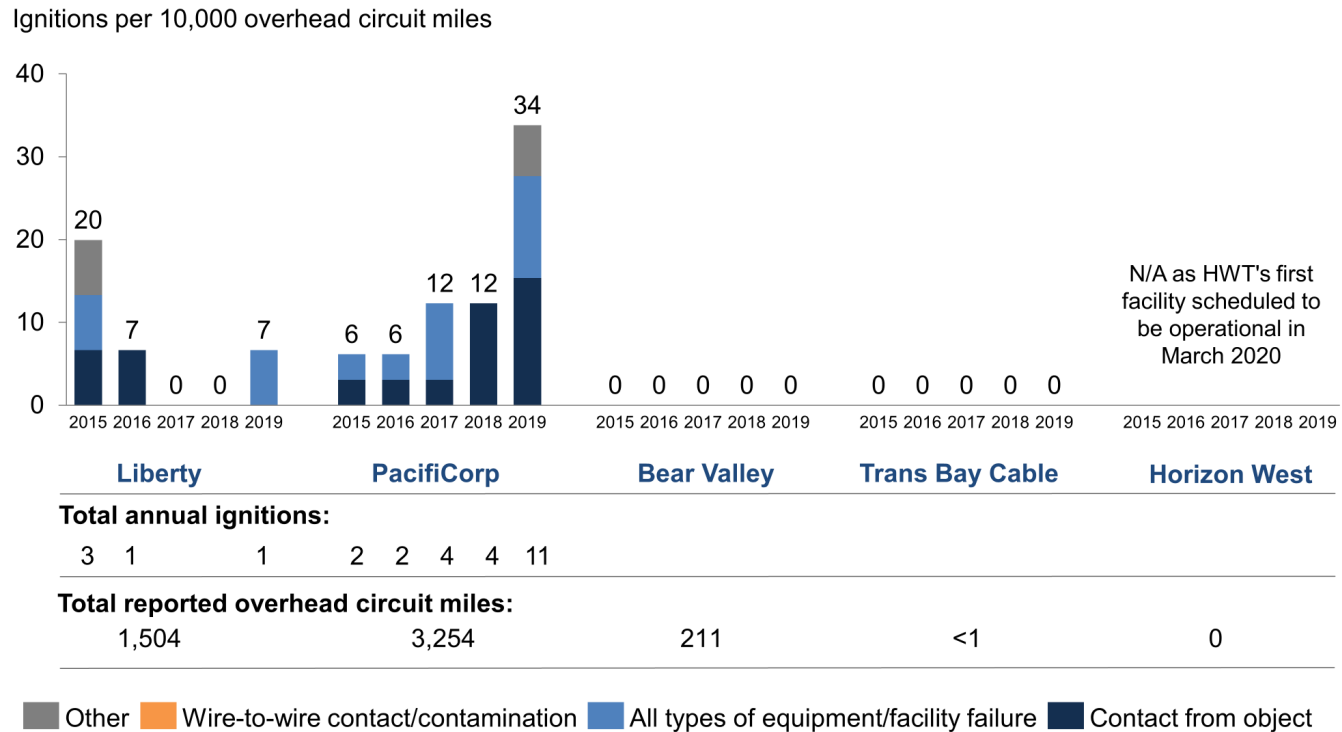
Source: Tables 11a and 11b from utility WMPs and data requests, normalized by data from Table 13 of utility WMPs; BVES numbers adjusted to address inconsistencies in subtotal calculations provided.

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.

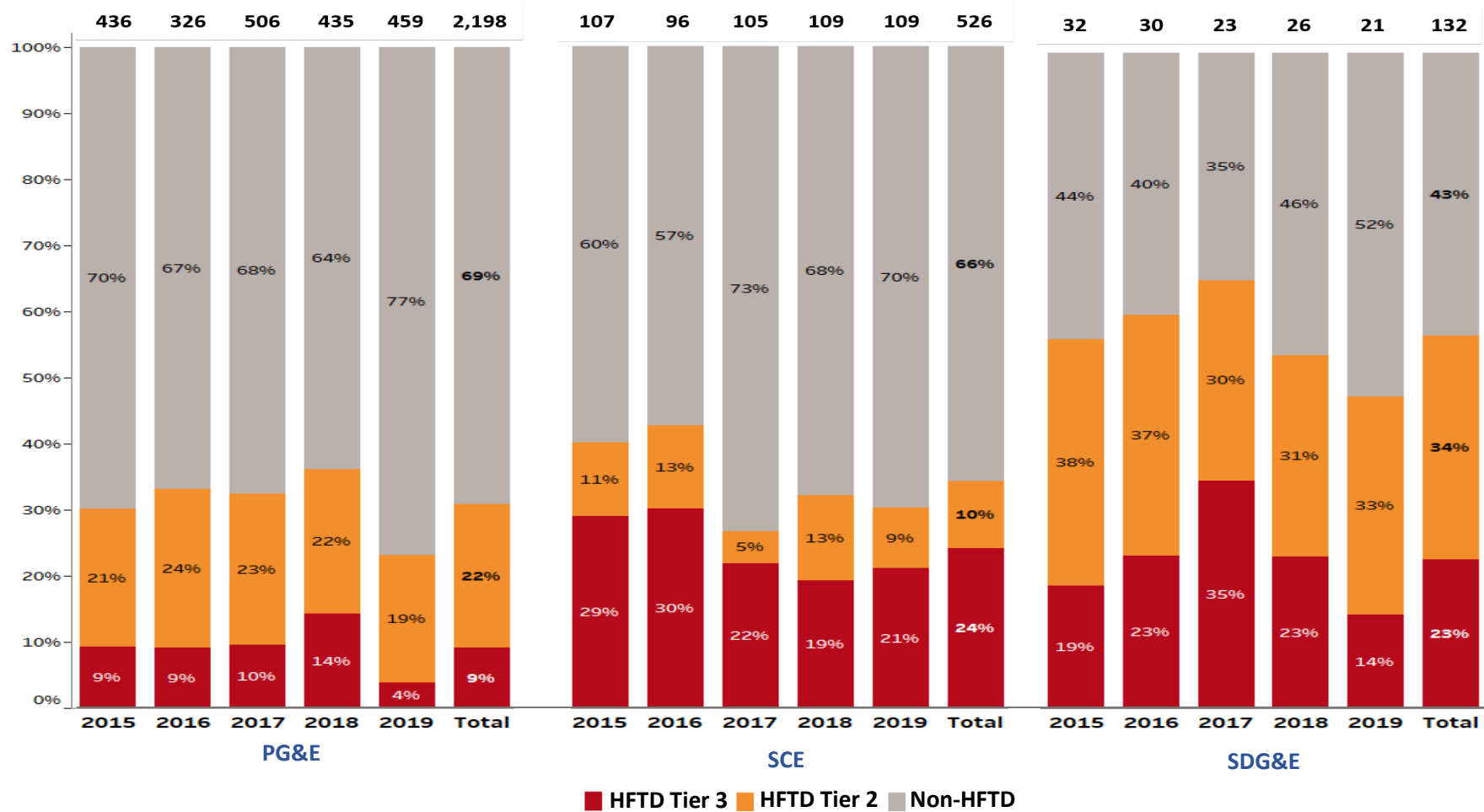
Figure 2.3b: Number of ignitions, normalized by overhead circuit mileage (Small utilities)



Note: Total number of ignitions 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)

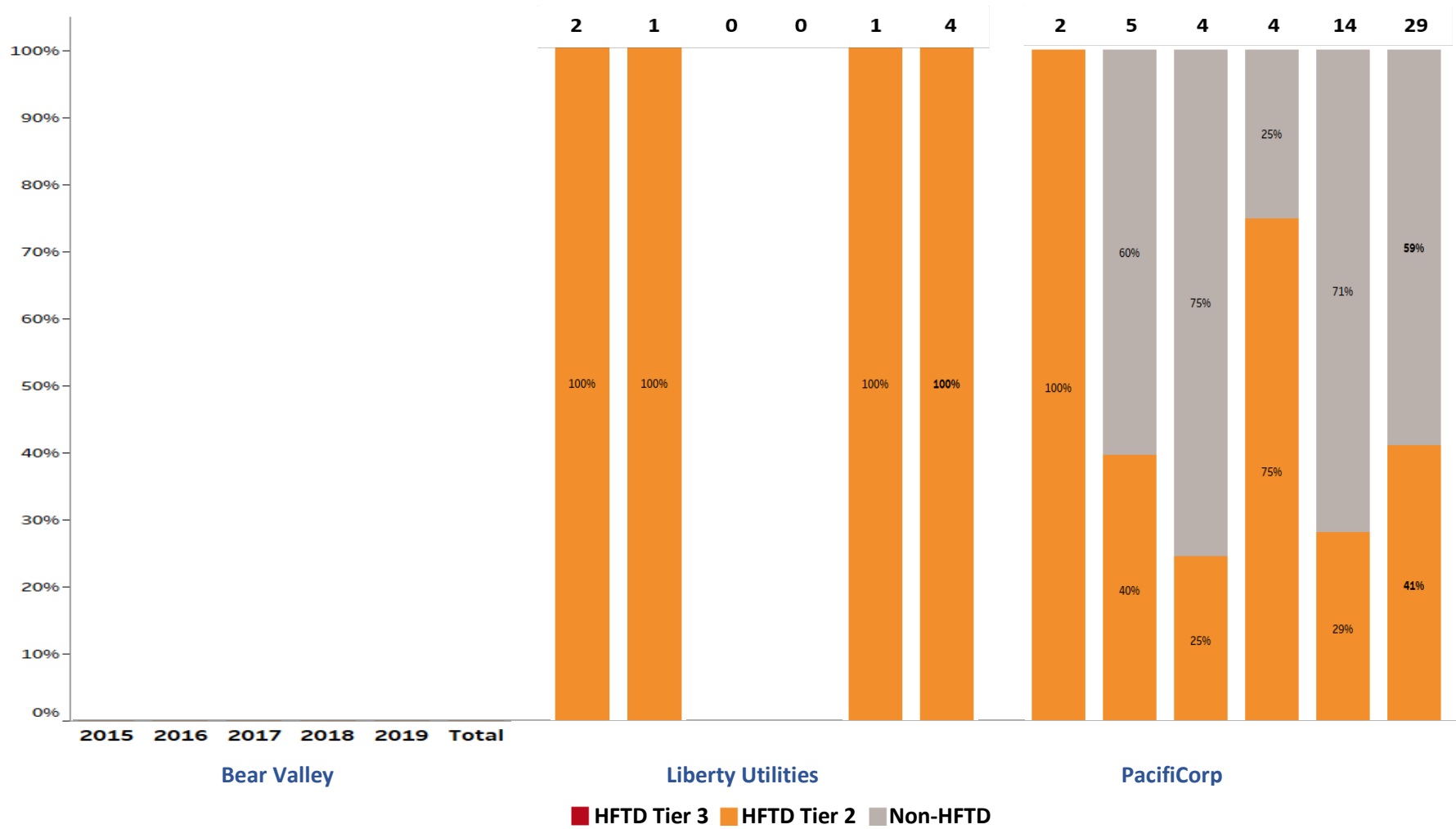


Note: Ignitions in Zone 1 HFTD areas make up less than 1% of total ignitions.

Source: Table 2 from utility WMPs



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

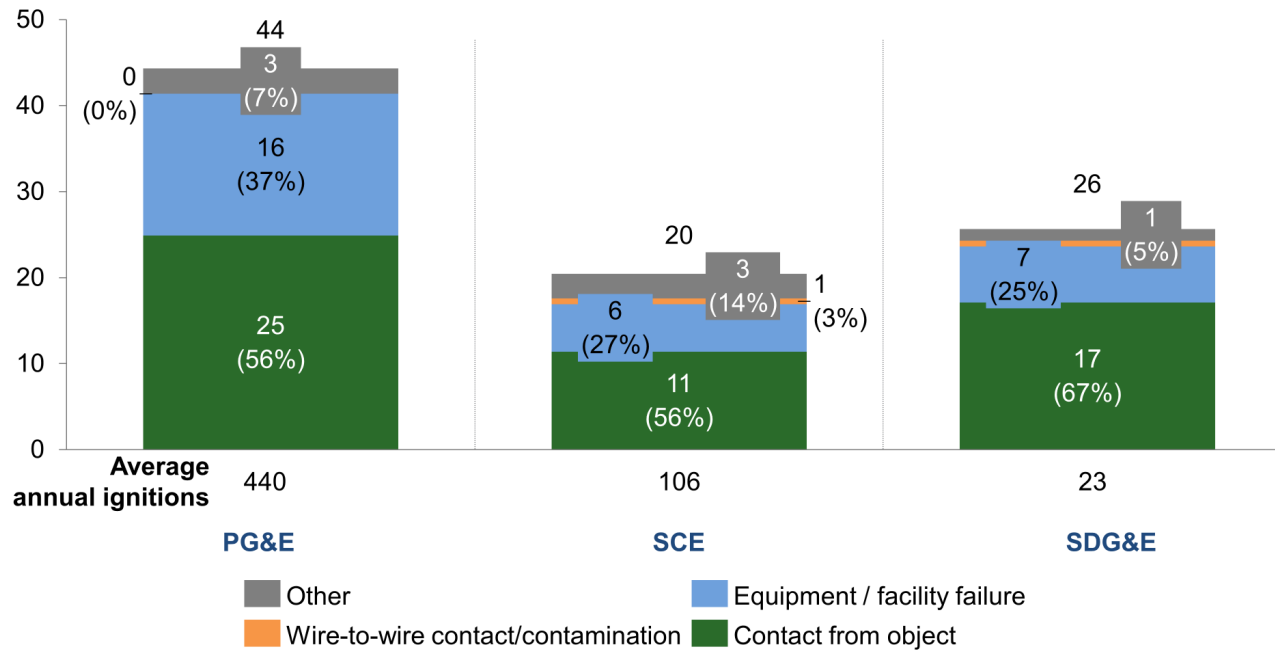


Note: Ignitions in Zone 1 HFTD areas make up less than 1% of total ignitions.

Source: Table 2 from utility WMPs

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

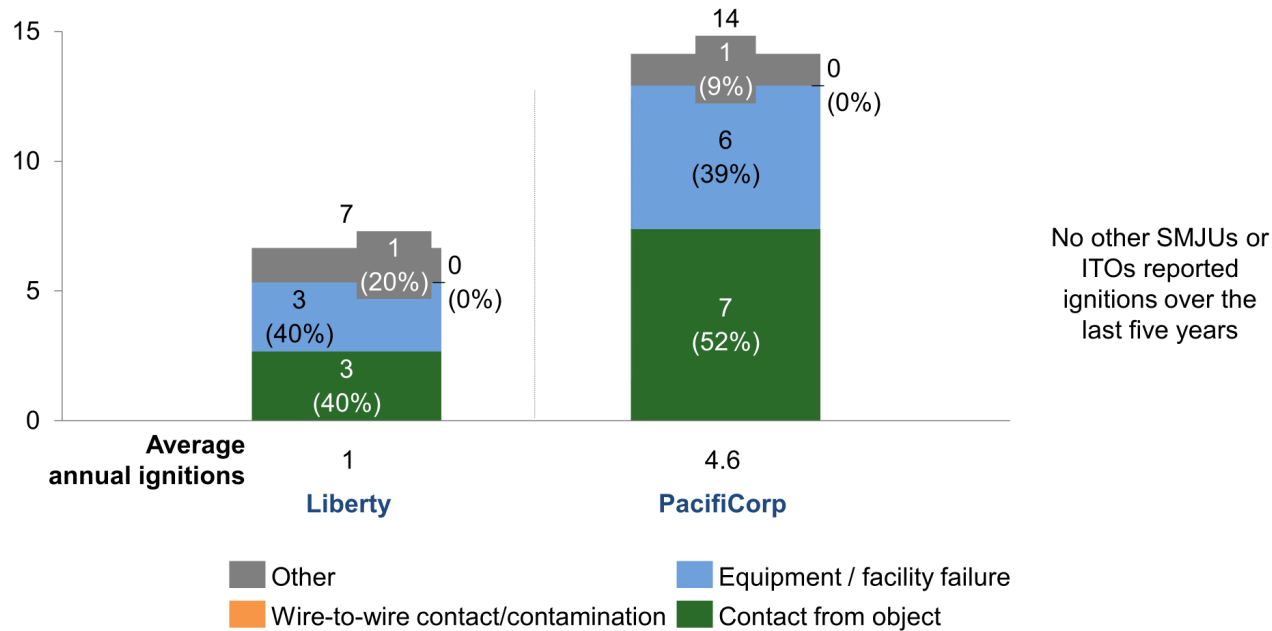
Average annual ignitions, transmission and distribution, 2015-2019, per 10,000 overhead circuit miles



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

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

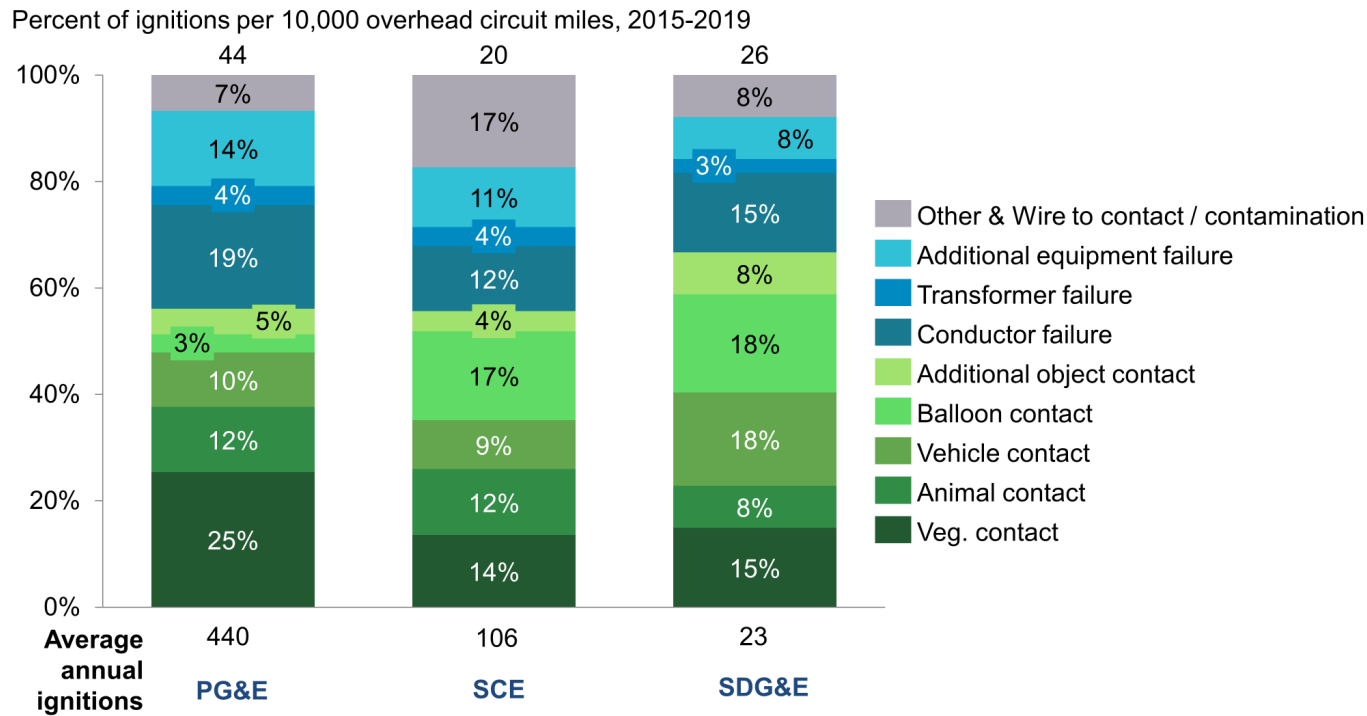
Average annual number of ignitions, transmission and distribution, 2015-2019, per 10,000 overhead circuit miles



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

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

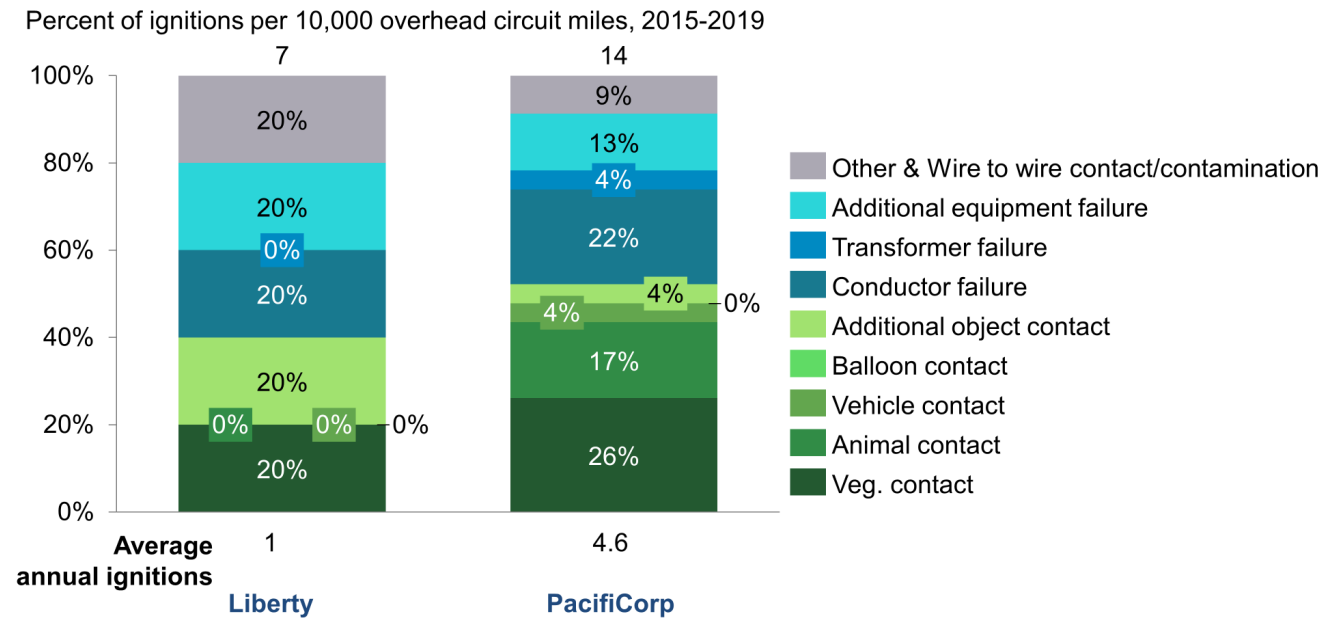
Figure 2.6a: Detail: Share of ignitions due to each ignition probability driver (Large utilities)



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

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

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

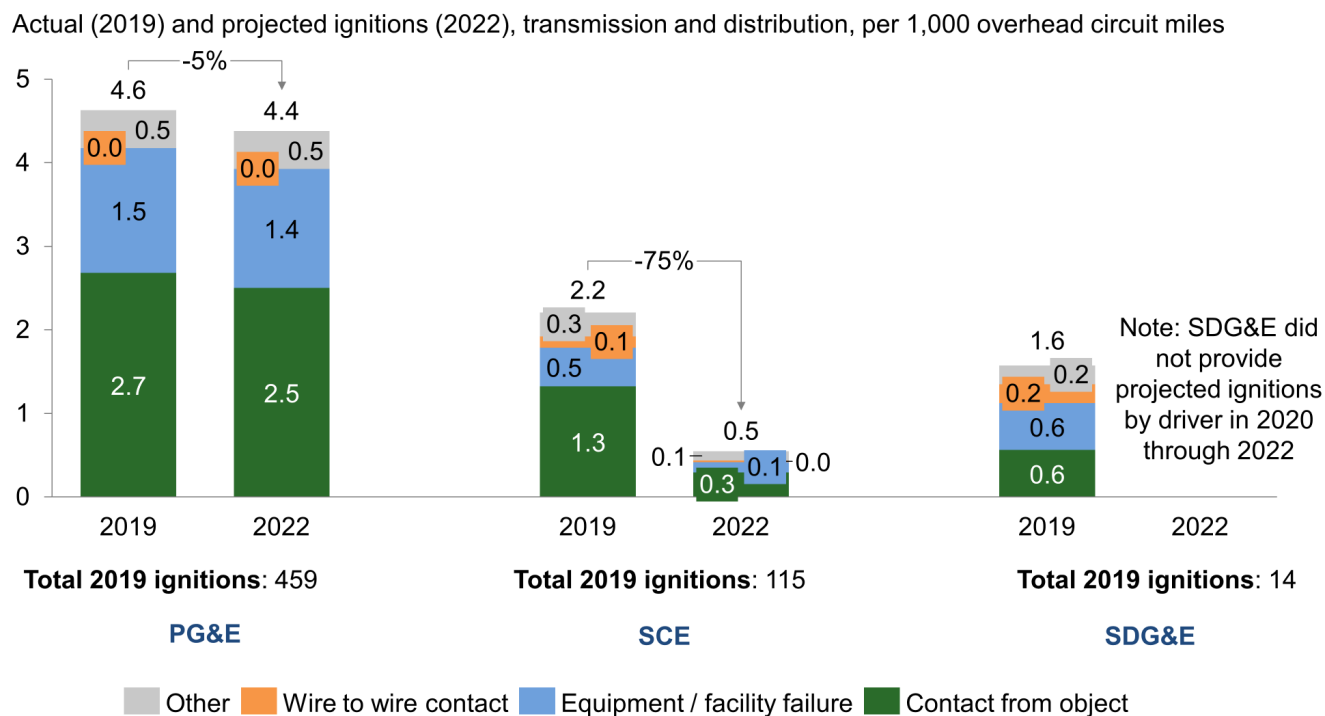


No other small utilities reported ignitions over the last five years

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

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

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



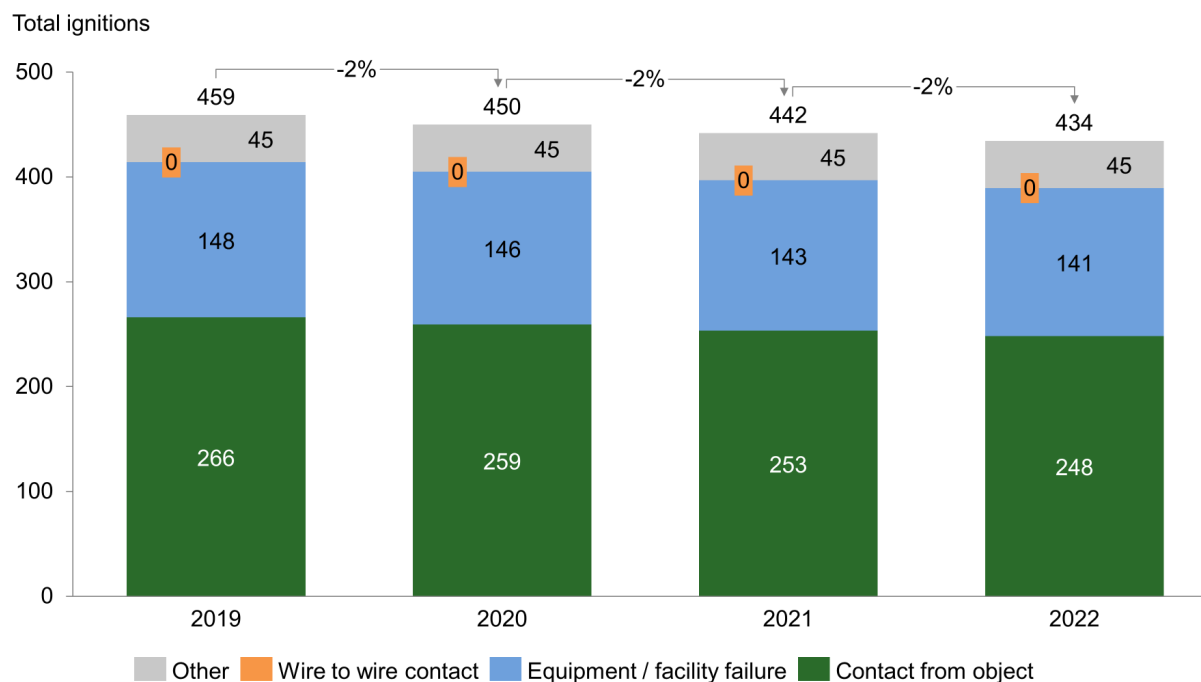
Note: Projections assume WMP implementation according to plan and weather patterns consistent with 5 year historical average. See the 2020 WMP Guidelines for further detail.

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

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

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

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

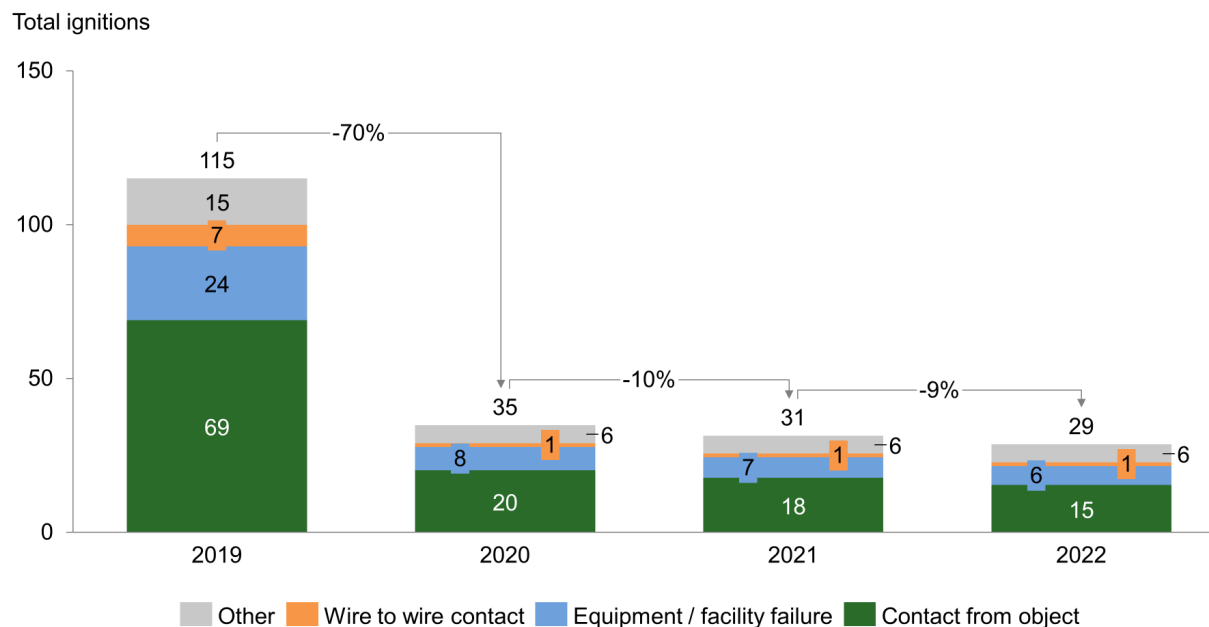


Note: Projections assume WMP implementation according to plan and weather patterns consistent with 5 year historical average. See the 2020 WMP Guidelines for more information on assumptions made.

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

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

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

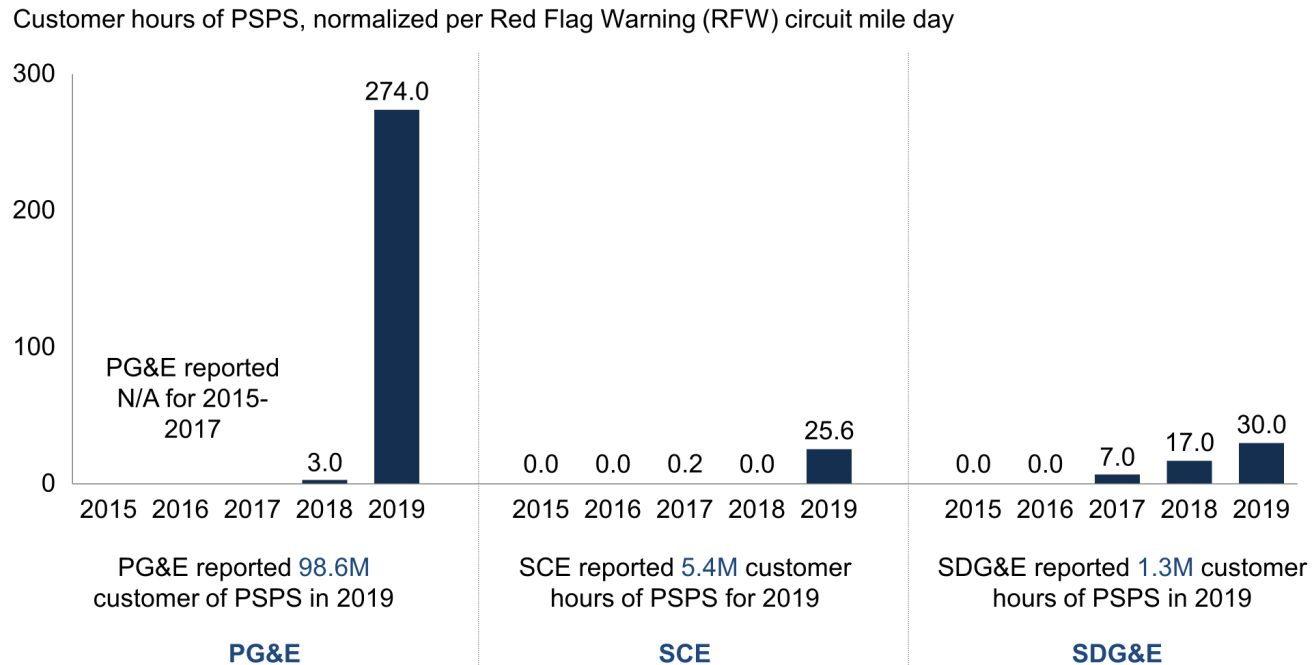


Source: Tables 11a, 11b, 31a, and 31b from SCE WMP and data requests

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



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

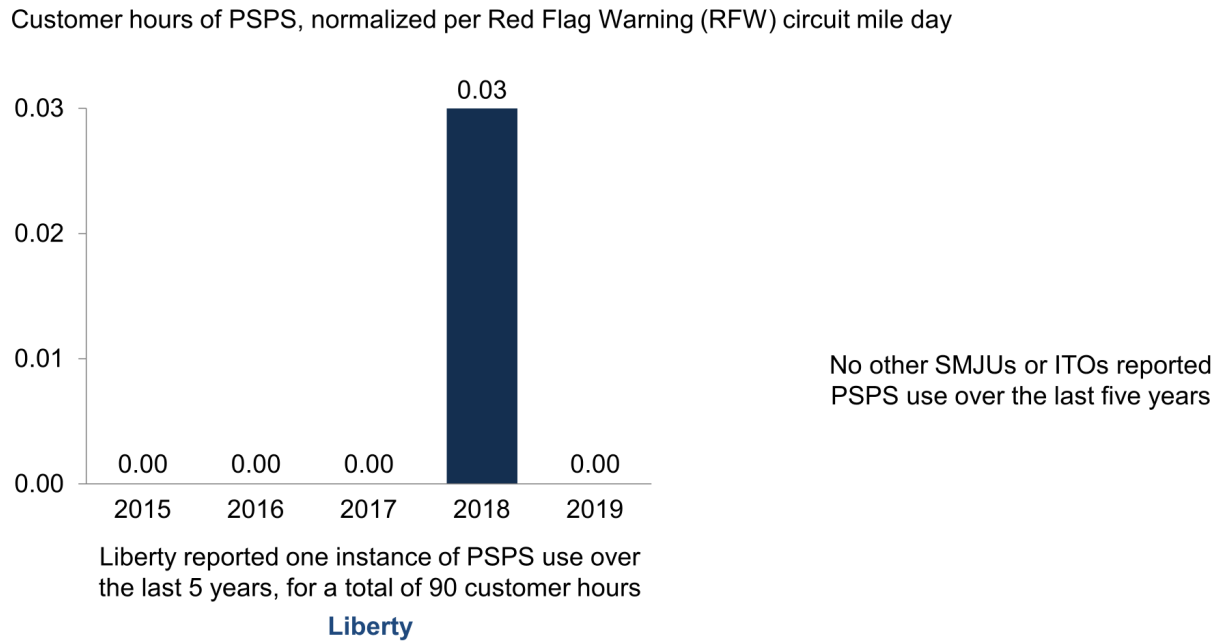


Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric; more detail is necessary to address potential inconsistencies in how each utility calculates this figure. A “Red Flag Warning (RFW) Circuit Mile Day” is intended to capture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

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

Source: Table 12 of utility WMPs.

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

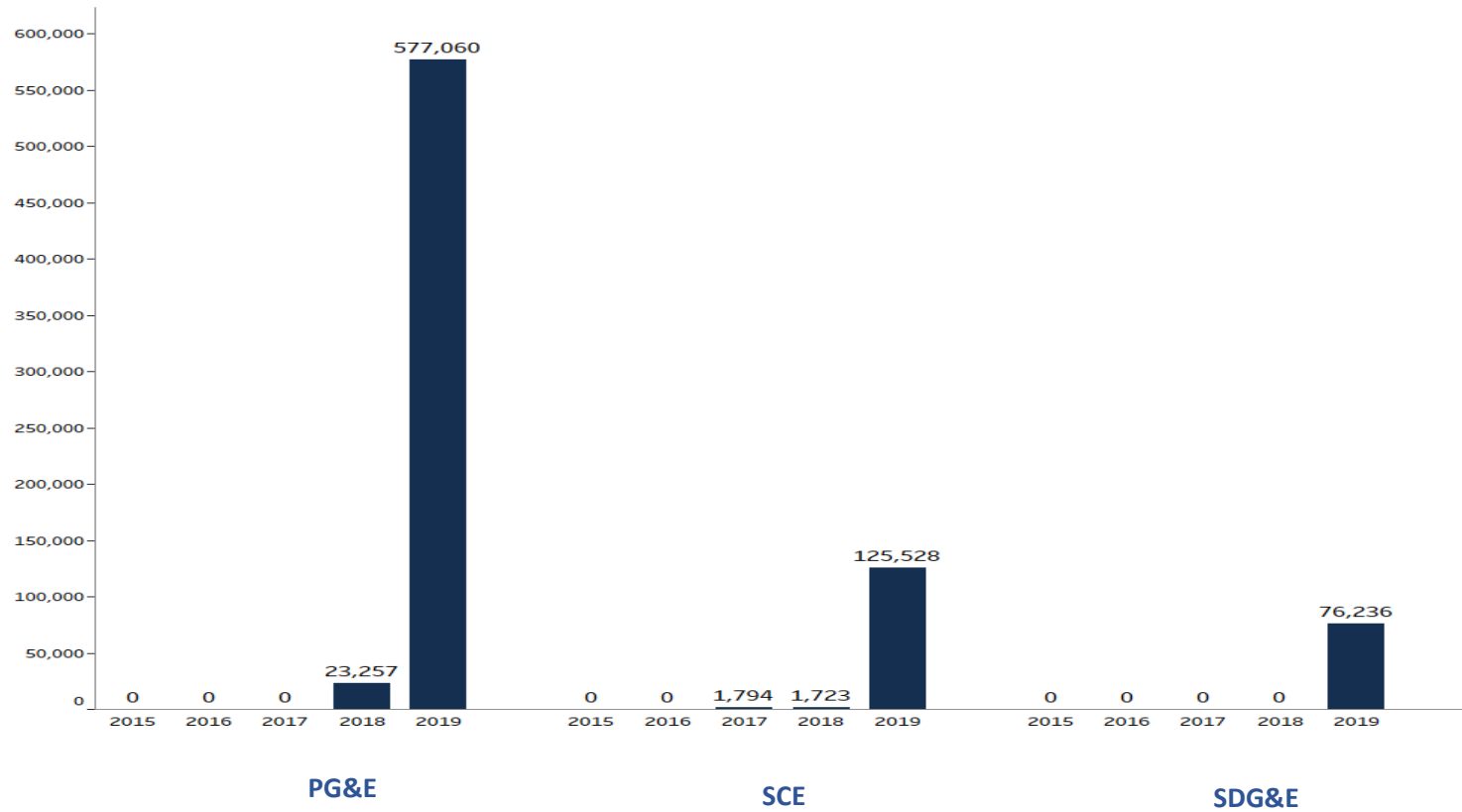


Note: Normalization using RFW circuit mile days helps take into account fire weather conditions based on a commonly used metric; more detail is necessary to address potential inconsistencies in how each utility calculates this figure. A “Red Flag Warning (RFW) Circuit Mile Day” is intended to capture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

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

Source: Table 12 of utility WMPs.

Figure 2.8c: PSPS impacts on critical infrastructure

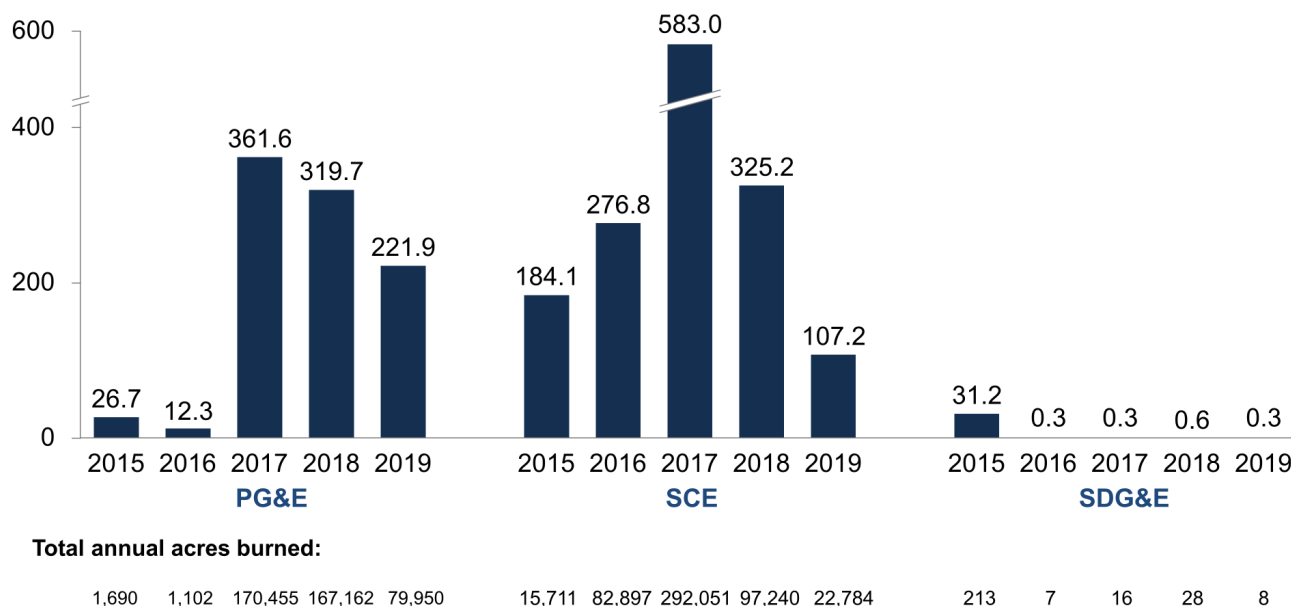


Note: Count is based on number of critical infrastructure locations impacted per hour multiplied by hours offline per year

Source: Table 2 of utility WMPs

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

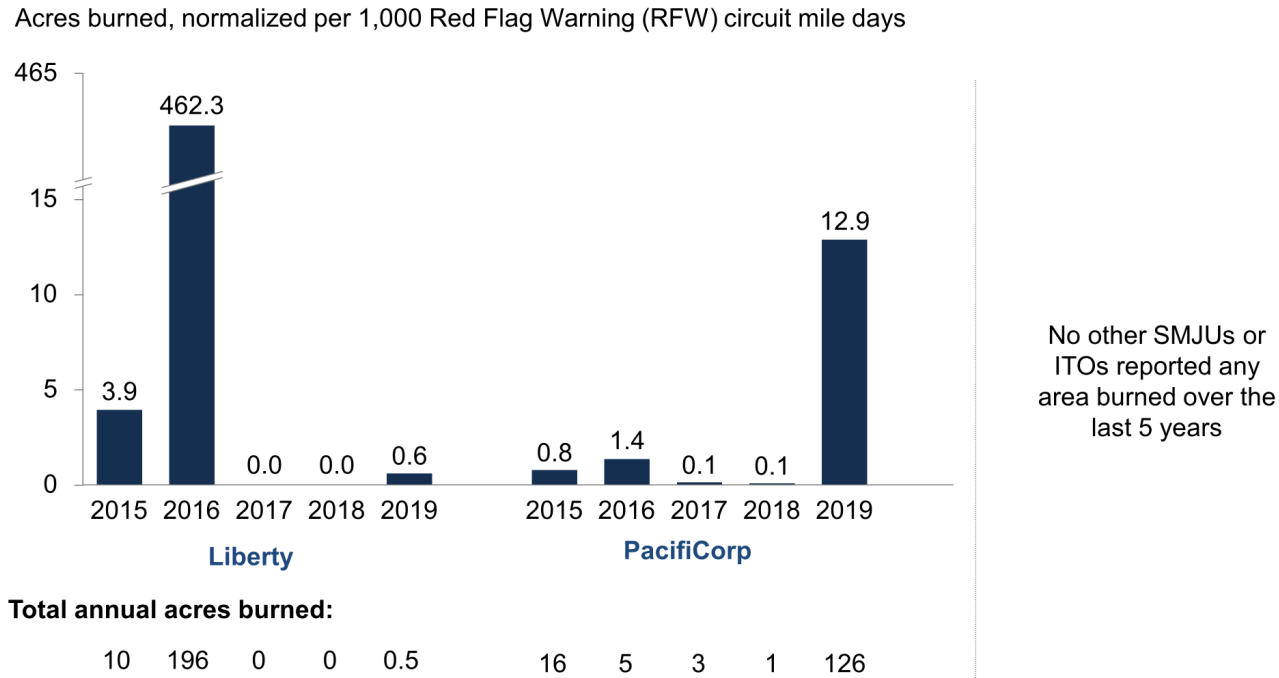
Acres burned, per 1,000 Red Flag Warning (RFW) circuit mile days



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

Source: Table 2 and Table 10 of utility WMPs.

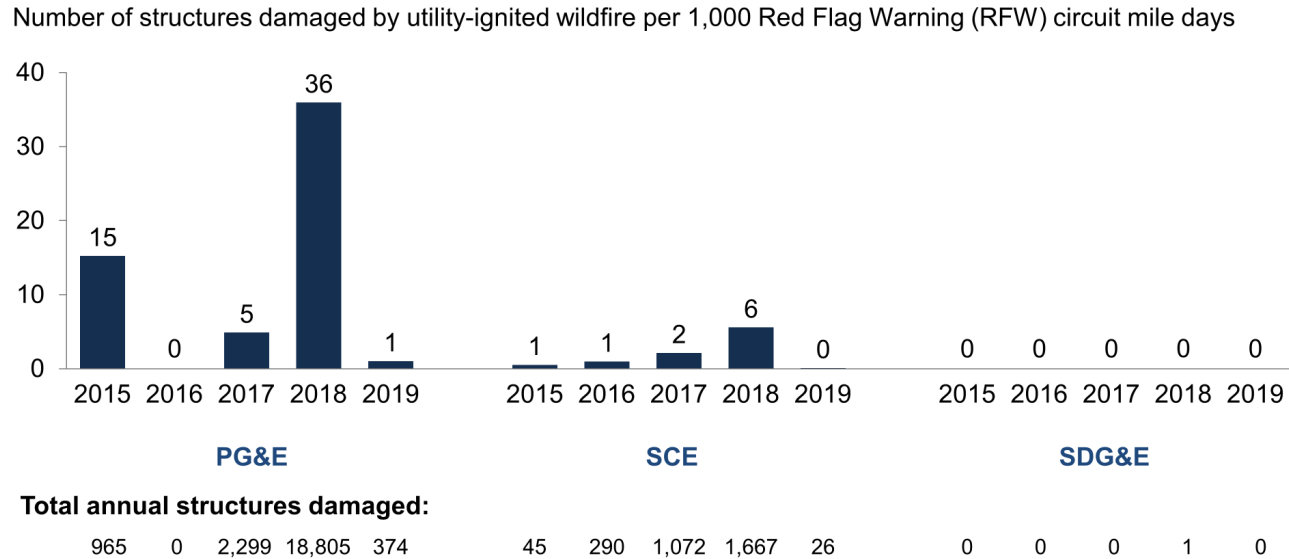
Figure 2.9b: Normalized area burned by utility ignited wildfire (Small utilities)



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

Source: Table 2 and Table 10 of utility WMPs.

Figure 2.10: Number of structures damaged by utility ignited wildfire



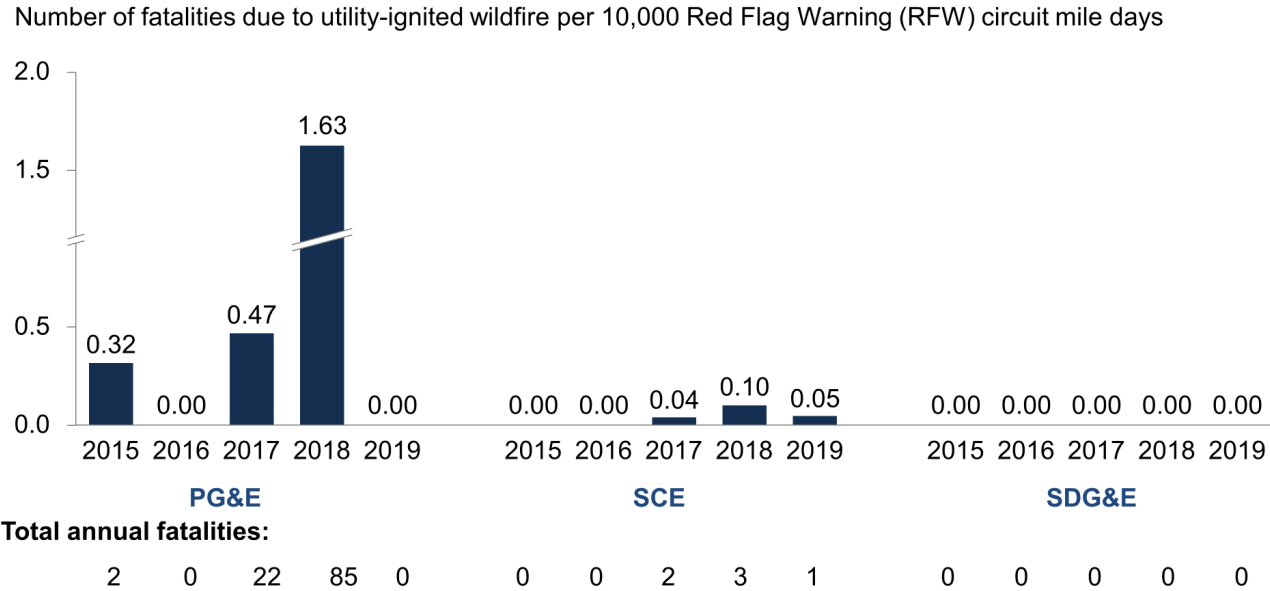
No SMJUs or ITOs reported number of structures damaged over the past 5 years

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

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

Source: Table 2 of utility WMPs.

Figure 2.11: Fatalities due to utility ignited wildfire



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

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

Source: Table 2 of utility WMPs.

### 1.3 Resource Allocation

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

		<b>PG&amp;E</b>	<b>SCE</b>	<b>SDG&amp;E</b>
<b>Total spend</b>	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	<b>\$9,548M</b>	<b>\$4,511M</b>	<b>\$1,336M<sup>1</sup></b>
<b>Normalized spend</b>	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)

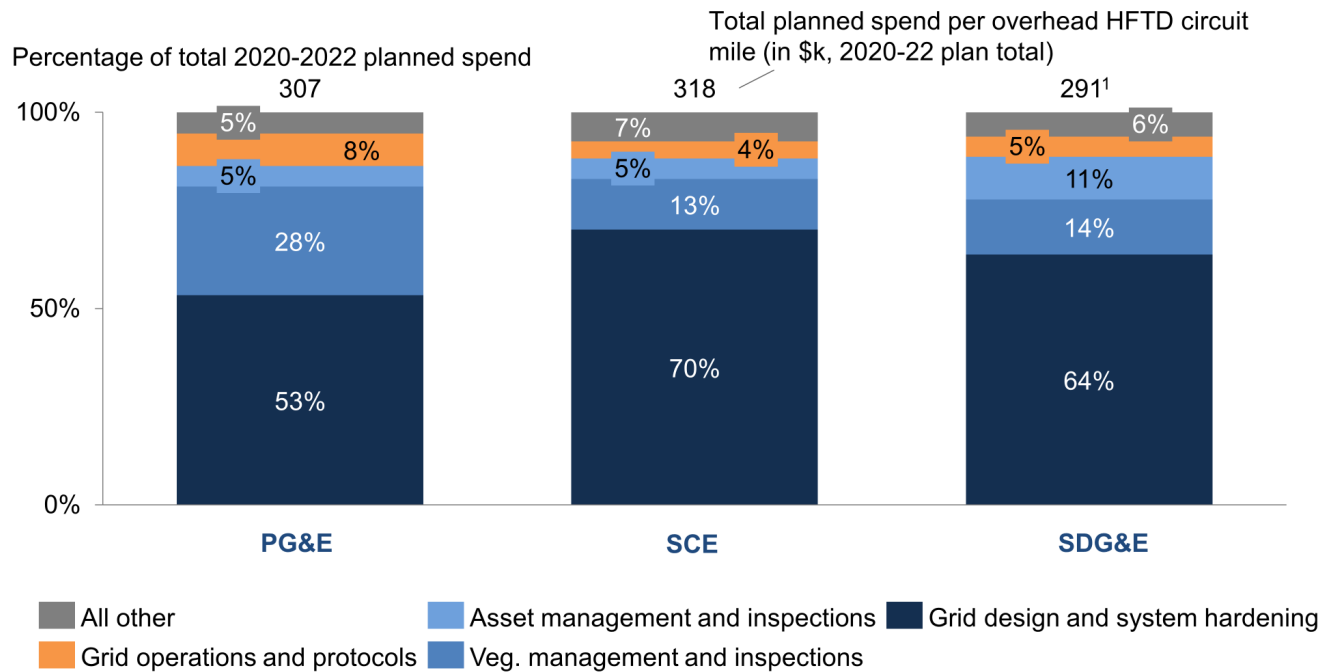
		<b>Liberty</b>	<b>PacifiCorp</b>	<b>Bear Valley</b>	<b>Horizon West</b>	<b>Trans Bay Cable</b>
<b>Total spend</b>	2019 planned spend	\$4M	\$1M	\$12M	\$0M	\$0M
	2019 actual spend	\$7M	\$13M	\$12M	\$0M	\$0M
	2020 planned spend	\$30M	\$26M	\$84M	\$4M	\$0M
	2021 planned spend	\$32M	\$38M	\$79M	\$4M	\$0M
	2022 planned spend	\$27M	\$37M	\$79M	\$0M	\$0M
	Total planned spend as for 2020, 2021 and 2022, as reported by utility	\$88K <sup>1</sup>	\$101M <sup>1</sup>	\$247M <sup>1</sup>	\$8M	\$0M
<b>Normalized spend</b>	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

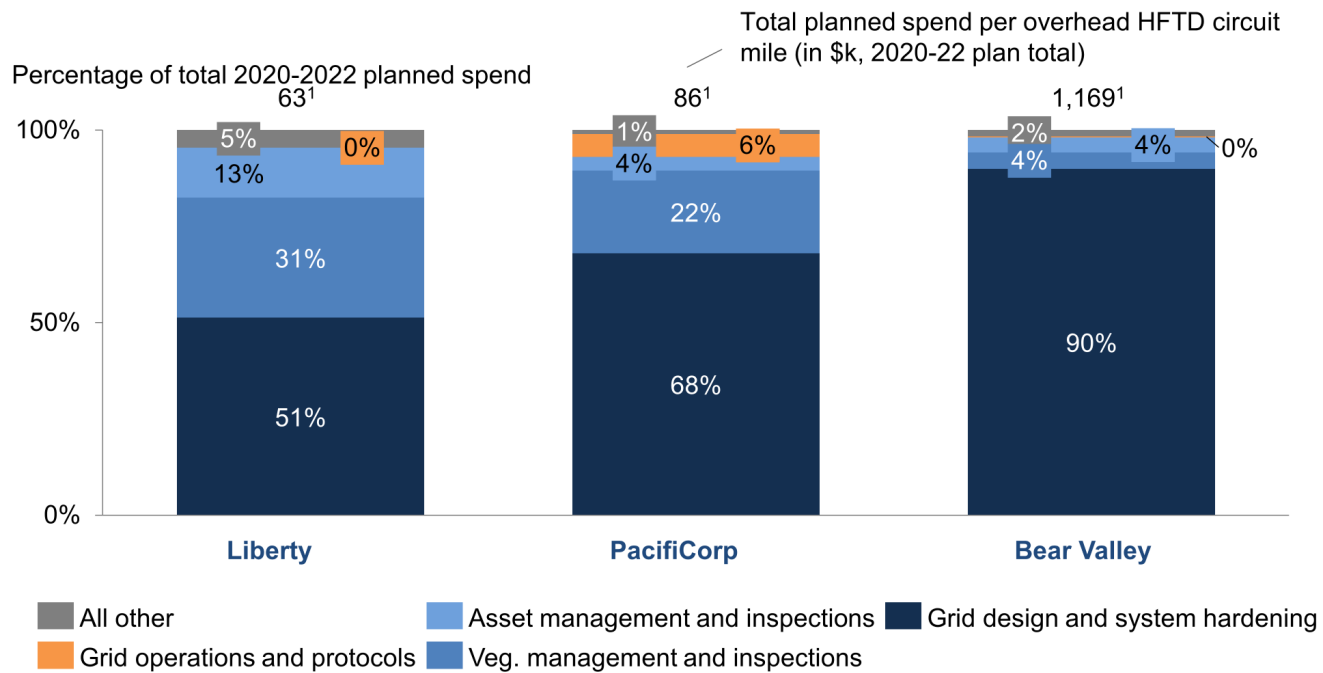
Figure 3.2a: Overview of total plan spend across utilities (Large utilities)



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*

Category	PG&E		SCE		SDG&E	
	Total plan spend, \$M	% of total	Total plan spend, \$M	% of total	Total plan spend, \$M	% of total
Grid design / system hardening	5,102	53%	3,162	70%	853	64%
Vegetation mgt. and inspections	2,645	28%	583	13%	187	14%
Asset mgt. and inspections	499	5%	232	5%	146	11%
Grid operations and protocols	788	8%	198	4%	68 <sup>1</sup>	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%
<b>Total plan, 2020-2022</b>	<b>9,548</b>	<b>100%</b>	<b>4,511</b>	<b>100%</b>	<b>1,336</b>	<b>100%</b>

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

Source: Tables 21-30 of utility WMPs

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

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

Category	Liberty		PacifiCorp		Bear Valley	
	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 <sup>1</sup>	90%
Vegetation mgt. and inspections	28	31%	22	22%	10	4%
Asset mgt. and inspections	11 <sup>1</sup>	13%	4 <sup>1</sup>	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%
<b>Total plan, 2020-2022</b>	<b>88</b>	<b>100%</b>	<b>101</b>	<b>100%</b>	<b>247</b>	<b>100%</b>

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*

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

Source: Tables 21-30 of utility WMP

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

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

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

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

Source: Tables 21-30 of utility WMP

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

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

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

Source: Tables 21-30 of utility WMP



Figure 3.5b: SCE resource allocation detail for top 4 categories by planned spend  
*Total plan spend is shown for 2020-2022 plan period as calculated by utility*

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

Source: Tables 21-30 of utility WMP

Figure 3.6a: SDG&E resource allocation detail for top 5 initiatives by planned spend  
*Total plan spend is shown for 2020-2022 plan period as calculated by utility*

	Initiative	Category	Planned spend, \$M					2020-2022 plan total	Initiative spend as percent of total plan spend
			2019 plan	2019 actual	2020 plan	2021 plan	2022 plan		
1	Undergrounding of Electric Lines and/or Equipment	Grid design and system hardening	2	5	31	157	188	376	28%
2	Distribution Overhead Fire Hardening (OH)	Grid design and system hardening	75	121	87	12	7	106	8%
3	LTE Communication Network	Grid design and system hardening	11	7	32	32	42	105	8%
4	Tree Trimming	Vegetation management and inspections	Not provided <sup>1</sup>	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%
<b>Total spend for top 5 initiatives by planned spend</b>			<b>88</b>	<b>166</b>	<b>204</b>	<b>253</b>	<b>284</b>	<b>741</b>	<b>55%</b>

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) <sup>1</sup>	1%

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

Note: "M" stands for millions

Source: Tables 21-30 of utility WMP

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

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

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

Note: "M" stands for millions.

Source: Tables 21-30 of utility WMP

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

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

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

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*

		Planned spend, \$M					2020-2022 plan total	Initiative spend as percent of total plan spend
Initiative	Category	2019 plan	2019 actual	2020 plan	2021 plan	2022 plan		
1 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%
<b>Total spend for top 5 initiatives by planned spend</b>		<b>3</b>	<b>3</b>	<b>59</b>	<b>64</b>	<b>64</b>	<b>187</b>	<b>43%</b>

Note: "M" stands for millions.

Source: Tables 21-30 of utility WMP

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

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

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

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)**