

REPORT

# RISK MODELING WORKING GROUP SUMMARY REPORT, PHASE III

*Summary of Discussions from 2024*



## PREPARED FOR

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## Revision Record Summary

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## Executive Summary

The Office of Energy Infrastructure Safety (Energy Safety) formed the Risk Modeling Working Group (RMWG) in 2021 with the stated goals to develop consistent approaches to wildfire risk modeling, improve collaboration among electrical corporations and provide an environment for stakeholders to provide input on wildfire risk modeling methodologies.

This report summarizes the discussions from Phase III, which occurred in 2024. The topics discussed in these meetings are summarized in Table 1.

*Table 1. List of Phase III (2024) RMWG meetings*

<b>Date</b>	<b>Topic</b>
<b>Mar 20</b>	Phase II Outcomes
<b>Apr 24</b>	Phase II Outcomes
<b>Jun 26</b>	Phase III Topics

Phase III consisted of both stakeholder interviews and three risk modeling working group sessions. The stakeholder interviews were conducted to receive feedback regarding the structure of the RMWG. The survey responses highlighted that the RMWG was valuable for creating a forum for discussion of the various methods and technologies implemented in the electrical corporation risk models. Participants emphasized the need for more clearly defined objectives and discussion topics for future RMWG meetings.

For each of the RMWG meetings, Energy Safety provided the electrical corporations with a series of prompts prior to the meeting to guide the discussion for the session. The first session in March discussed outcomes from Phase II, with electrical corporations and various government stakeholders at the local, state, and federal levels providing insights into model transparency, definition and component standardization, risk frameworks, and wind modeling and weather scenarios. Stakeholders reached consensus that standardization efforts should prioritize foundational elements such as risk planning thresholds/tolerances, definitions, conditions, inputs, and planning standards. Building on the first session, the second session in April continued to focus on outcomes from Phase II, with Energy Safety's prompts guiding the discussion toward understanding how WMP Guidelines could be revised for clarity purposes for each topic discussed in the first session.

The last meeting in June established expectations for a data request issued to all participating electrical corporations and proposed a schedule and session topics for Phase III. The data request was intended to create a baseline understanding of electrical corporations' wildfire risk models for possible cross-comparison. Stakeholders agreed that the RMWG should focus on producing actionable outcomes regarding alignment of core methodology for their risk models, using the responses from the data request as a starting point for this alignment.

## 1.0 Introduction

### 1.1 BACKGROUND

Energy Safety formed the RMWG in 2021 with the stated goals to:

- + Develop a more consistent approach to wildfire risk modeling
- + Improve collaboration among the electrical corporations on wildfire risk modeling
- + Provide an environment for stakeholders and academic experts to provide input on wildfire risk modeling methods
- + Increase transparency in electrical corporation approaches to wildfire risk modeling

The group has met approximately monthly since 2021 to discuss a variety of topics. These discussions have been organized into annual phases (with the exception of Phase I which included 2021-2022).

Phase I consisted of 13 meetings from October 2021 to December 2022. Table 2 provides a list of the topics discussed during Phase I of the RMWG. The discussions, outcomes, and takeaways from these meetings are summarized in the Phase I report<sup>1</sup> which was published on the Energy Safety docket<sup>2</sup> on June 15, 2023.

*Table 2. List of Topics from Phase I*

Date	Topic
10/05/2021-10/06/2021	Initial RMWG Presentations
10/27/2021	RMWG Organizational Conference
11/17/2021	Review of Consequence Models
12/08/2021	Risk Drivers, Probability of Ignition Models, and Data/Inputs
03/02/2022	Likelihood of Vegetation Risk Events and Ignitions
04/13/2022	PSPS Likelihood and PSPS Consequence, Reliability Analysis, and Impacts
05/25/2022	Modeling Algorithms, Part 1
06/15/2022	Wildfire Related Modeling Algorithms, Part 2
07/13/2022	Modeling Algorithms, Components, Linkages, and Interdependencies, Part 1
08/10/2022	Modeling Algorithms, Components, Linkages, Interdependencies, and Climate Change, Part 2
09/14/2022	Lessons Learned, Guideline Improvements, Topics for the Next Session
12/14/2022	Comprehensive Accounting for Wildfire Smoke Consequences

<sup>1</sup> Level 4 Ventures, Inc. *Risk Modeling Working Group Summary Report, Phase I*, 2023.

<sup>2</sup> Risk Model Group Docket, <https://efiling.energysafety.ca.gov/EFiling/DocketInformation.aspx?docketnumber=Risk-Model-Group>

Phase II consisted of 12 meetings from January to December of 2023. Table 3 provides a list of the topics discussed during Phase II of the RMWG. The discussions, outcomes, and takeaways from these meetings are summarized in the Phase II report<sup>3</sup> which was published on the Energy Safety docket<sup>4</sup> on June 4, 2025.

*Table 3. List of Topics from Phase II*

<b>Date</b>	<b>Topic</b>
<b>01/11/2023</b>	Finalizing Session Topics for RMWG 2023
<b>02/15/2023</b>	Coordination of Government Wildfire Plans with Utility Wildfire Mitigation Plans
<b>03/15/2023</b>	Creating and Maintaining an Out-Year Fuelscape
<b>04/12/2023</b>	Wildfire Consequence Modelling – Conflagration Risks
<b>05/10/2023</b>	Approaches to Factoring Suppression into Fire Models
<b>06/14/2023</b>	Approaches to Factoring Ingress and Egress into Fire Models
<b>07/11/2023</b>	Approaches to Modeling Long Duration, High Intensity Wildfires
<b>08/09/2023</b>	PSPS Planning Models
<b>09/14/2023</b>	Avoiding Bias in Wildfire Probability Modeling
<b>10/11/2023</b>	Standardized Wildfire Risk Type Classifications and in situ Wildfire Risk Assessment
<b>11/08/2023</b>	Model Maintenance and Data Collection
<b>12/13/2023</b>	Review of Wildfire Related Operational Models

This report documents the discussions occurring during Phase III (2024).

## 1.2 DOCUMENT SCOPE AND PREPARATION

The purpose of this document is to summarize the discussions from each meeting of the RMWG during Phase III (2024). This document was prepared by Jensen Hughes, Inc. (JH) on behalf of Energy Safety. The content was prepared based on slides and detailed minutes provided to JH by Energy Safety.

## 1.3 MEMBERSHIP OF THE RISK MODELING WORKING GROUP

The RMWG meetings are open to Energy Safety, electrical corporations, stakeholders, and technical experts to allow for open dialogue. This process allows the group to dive into technical details among members who are committed to attending regularly. Interested parties can apply to be members of the working group by submitting an application to the Risk Model Group docket.

## 1.4 RMWG MEMBERS

The membership during Phase III of the RMWG is summarized in Table 3.

<sup>3</sup> Jensen Hughes, Inc. *Risk Modeling Working Group Summary Report, Phase II*, 2025.

<sup>4</sup> Risk Model Group Docket,  
<https://efiling.energysafety.ca.gov/EFiling/DocketInformation.aspx?docketnumber=Risk-Model-Group>

*Table 4. RMWG Members During Phase III*

<p><b>SMJU:</b>                  Bear Valley Electric Service (BVES)                  Liberty Utilities (LU)                  PacifiCorp (PC)</p>	<p><b>Large IOU:</b>                  Pacific Gas &amp; Electric (PG&amp;E)                  San Diego Gas &amp; Electric (SDG&amp;E)                  Southern California Edison (SCE)</p>	<p><b>Vendor:</b>                  Technosylva</p>
<p><b>State Agency:</b>                  California Public Utility Commission (CPUC)                  California Department of Forestry and Fire Protection (CAL FIRE)                  Office of Energy Infrastructure Safety (Energy Safety)</p>	<p><b>Stakeholder:</b>                  Green Power Institute                  CPUC Public Advocates                  Mussey Grade Road Alliance</p>	<p><b>Advisory:</b>                  Level 4 Ventures</p>

## 1.5 CONTRIBUTIONS

Members of the RMWG were invited to provide comments on this Summary Report. Members had 14 days to review, and all comments received were evaluated for incorporation into the report.

## 2.0 Phase III Summaries

The following subsections provide a high-level summary of the discussions from Phase III of the RMWG occurring during the calendar year of 2024. Each meeting included a set of questions or prompts which electrical corporations were asked to address during the meeting. The discussions centered on these prompts, but the conversations were allowed to diverge from these prompts as the conversation evolved.

The following sections provide the following information from the meetings:

- + Summary of meeting topics and list of provided questions or prompts.
- + Summary of ensuing discussion between participating electrical corporations and stakeholders.
  - What additional topics were covered that were not prompted?
  - What actions, suggestions, or recommendations for follow-up were mentioned? Were these addressed in a future meeting?

These sections provide high-level summaries of this information.

### 2.1 03/20/24 – PHASE II OUTCOMES

The purpose of this meeting was to review and discuss outcomes from the Phase II (2023) RMWG meetings. The meeting format included brief synopses of conclusions for several distinct topics, with discussion questions designed to facilitate further dialogue. Summaries of the outcomes and ensuing discussions for each topic are provided below.

#### 2.1.1 Further Transparency of Models

Following Phase II discussions, the working group identified that Wildfire Mitigation Plan (WMP) Guidelines may need to be refined to ensure better transparency of utility risk models. Specifically, the guidelines should provide more clarity on documentation of model versions and model applications within the risk analysis. The following questions were presented to guide further discussion:

- + How should it be clearer within the 2026-2028 Guidelines which models are being used and where?
- + How are utilities' models tied together, and how could that be demonstrated more clearly within guidelines (i.e. use of swim lanes, diagrams)?
- + Which models play into decision-making and where?

PG&E noted that their risk models provide insights rather than definitive answers, acknowledging challenges in tracking which versions inform multi-year projects. SCE and SDG&E referenced their QDR reports and flow diagrams as resources, with SDG&E emphasizing the need for greater specificity given current guideline ambiguity.

There was consensus that electrical corporations should include model outputs directly in WMP submissions rather than requiring data requests (DR). Reviewers currently access circuit segment risk scores and geospatial data through DR processes, with formats varying by electrical corporation. GPI recommended developing web-based platforms with public access to standardize outputs and replace the current DR approach.

Regarding standardization, participants identified a sequencing challenge: WMP guidelines should reflect standardization goals, but those goals must be established first. They suggested determining high-level

objectives before developing reporting requirements. The timeline for implementing standardization was acknowledged as potentially lengthy—possibly 5 years for rigorous approaches involving model adjustments and risk mitigation planning changes—though less rigorous options like standardizing definitions (e.g., "destructive wildfires") could be implemented more quickly. The group emphasized the need to identify meaningful, feasible progress steps with realistic timelines.

### 2.1.2 Continued Standardization of Definitions and Components

Discussions from the Phase II meetings clarified that various definitions for variables, components, and risks should be consistent across not only utilities, but governing agencies. The following questions were presented to guide further discussion:

- + What variables, mechanisms, and data sources should be included within 2026-2028 Guidelines for further standardization that are not already defined within guidelines (fuelscapes, weather scenarios, etc.)?
- + Which variables require additional coordination with other agencies through what venues? Which agencies should be included?

The group emphasized the need for standardized ignition definitions, noting discrepancies between Energy Safety and CPUC definitions, and clarifying whether success is measured by ignition reduction versus consequence reduction. SCE suggested a workshop to address this, since understanding is already generally consistent amongst electrical corporations.

GPI proposed breaking down models into inputs, processes, and outputs to prioritize standardization efforts with the greatest impact. They identified low-hanging fruit such as standardizing fuelscape inputs (parameters, 2030 forecasts, update frequency, data granularity) and suggested a staff proposal categorizing models, submodels, and components by implementation difficulty. They recommended prioritizing foundational elements like risk threshold setting, base inputs (fuelscape), and base methodologies (consequence and probability of ignition modeling) before addressing more nuanced components.

SDG&E requested feedback on what isn't clear in their WMPs, noting they provide detailed model descriptions but receive few clarification questions, making it difficult to know what requires further explanation.

GPI acknowledged the challenge of reconciling 3-year plan cycles with longer-term development tracks, noting that standardization discussions don't fit neatly into current plans. They highlighted that multiple definitions of "destructive fires" exist across IOUs and questioned whether standardization requires top-down regulation or can be addressed through separate processes. GPI suggested distinguishing between actionable current guideline requirements and longer-term development tracks requiring cross-proceeding assessments and additional CPUC guidance. They proposed reframing the discussion to identify immediate standardization opportunities (e.g., fuelscape layers, refresh rates, forecasts) while bucketing more complex items for separate tracks and future consideration.

PG&E noted some steps don't align one-to-one and highlighted areas where fire science remains underdeveloped. SCE found the existing paradigm acceptable but noted that some components borrowed from forest service activities (e.g., burn probability, fire intensity) weren't designed for utility wildfire risk and may be counterproductive or irrelevant. They emphasized that wildfire hazard intensity represents fuel models on the landscape rather than requiring direct response.

GPI raised the need to identify overlapping CPUC proceedings and clarify where decision-making occurs to establish RMWG standardization priorities. SCE supported this, noting active discussions on risk tolerance, scaling, tail risk, tranching, and uncertainty across proceedings like Climate Change Phase II. They highlighted

tensions between SB 901 mandates (preventing catastrophic wildfires while avoiding undue customer outage burdens) and suggested the framework could incorporate climate adaptation with a separate expanded document cross-referencing decisions from other proceedings.

### 2.1.3 Further Development for Various Components

Throughout Phase II, it was apparent that various components still require additional research and discussion to get to a point of proper integration by electrical corporations, such as fire suppression impacts, smoke impacts, ingress/egress, and climate change. Despite the need for additional research on these topics, these components should still be captured within models given the importance. The following questions were presented to guide further discussion on how to capture these components in WMP reporting:

- + How should the 2026-2028 Guidelines capture these various components to ensure utilities are moving forward with integration?
- + To increase transparency, what should be required to report on for each of these components (i.e. measurements of accuracy and validity of component's impact, SME expertise being used)?
- + Is there any particular guidance for each of these components that can be standardized now (i.e. mechanisms being used to model, data sources or external models being used)?

GPI proposed prioritizing foundational models (POI, POI given failure, consequence) before sub-models, acknowledging nascent science in areas like ingress/egress. They recommended waiting for CPUC climate change guidance to avoid misalignment and suggested standardizing risk planning thresholds/tolerances, definitions, conditions, inputs, and planning standards. Other members agreed that ingress/egress is more tractable than highly complex areas like fire suppression and smoke impacts. SDG&E emphasized leveraging existing state expertise (e.g., CAL FIRE) and integrating their models.

MGRA noted electrical corporations face unique problems requiring tailored framing to solicit solutions from external experts, questioning how Energy Safety could issue problem statements to attract funding and academic/agency work given current lack of good scientific frameworks. GPI proposed a high-level staff proposal defining standardization objectives, barriers, and need statements to formalize capability gaps (e.g., smoke, fire suppression, consequence factors) and create a broader wildfire risk modeling space beyond WMP filings—accessible to SMEs, academia, and public agencies for gap identification and development.

The group also discussed flexibility in submodels. GPI suggested capturing optional submodels for standardization. SDG&E emphasized avoiding duplication (e.g., law enforcement handling ingress/egress). SCE noted having egress and social vulnerability models but no EPSS program, suggesting core elements with utility-specific flexibility. MGRA highlighted that PSPS/EPSS programs incorporating ICE models for outage consequences may substantially increase risk calculations compared to past approaches.

### 2.1.4 Understanding of Ignition Risk

The Phase II meetings identified that ignition risk components vary greatly across electrical corporations with regard to the included components and data sources used for determining ignition risk. The following questions were presented to guide further discussion:

- + What are all of the components for LoRE models that should be included?
- + How should 2026-2028 Guidelines provide guidance on which certain ignition risk types should be included in risk modeling (contact from object, equipment failure)?

- + Should this include a specific list of equipment types that must have ignition risk evaluations built into the model?
- + How should utilities be evaluating third-party ignitions in comparison to utility-related ignitions when weighing risk outputs?

SCE emphasized the need to compare WMPs side-by-side before determining whether standardization is necessary, noting that geographic differences may already account for variations. They questioned whether understanding both average and risk-based metrics is needed given risk tolerance considerations, suggesting focus on tail risks rather than median values since catastrophic events are the primary concern. SCE expressed concern about additional work not directly relevant to wildfire risk planning.

GPI identified a gap in addressing foundational standardization topics first—specifically risk tolerance and threshold setting—which have filter-down effects on other components. They noted that after five years of WMP filings, continuing to backburner these issues while focusing on low-hanging fruit creates compounding delays. GPI argued that tackling larger, foundational questions now is essential since implementation takes years, even if it means deprioritizing seemingly easier tasks.

### 2.1.5 Interrelationships between risks

The Phase II meetings identified the need for electrical corporations to report on how they are tracking and understanding risks that span multiple models and may impact augmentation of risk as a result. The following questions were presented to guide further discussion:

- + What factors should be evaluated for interrelationships and how should that be defined within the 2026-2028 Guidelines (wind, vegetation, etc.)?
- + How should utilities model and capture interrelationships within LoREs, CoREs, and between LoRE-CoRE?
- + How should utilities evaluate the likelihood of simultaneous risk events is captured and used in risk modeling?

MGRA identified a missing element: for utility fires, likelihood and consequence aren't entirely decoupled, with correlation between the two driven by shared inputs. They cited catastrophic fires occurring during high wind events where wind drives both ignitions and rapid fire spread—making PSPS an important countermeasure. Other examples were added including live fuel moisture (affecting consequence more than ignitions) and invasive species, noting these correlations dramatically impact tail risks and worst-case scenarios.

Regarding PSPS likelihood models, Energy Safety asked about inputs and submodels. SCE and SDG&E confirmed likelihood depends primarily on weather forecasts, with equipment age and other factors potentially incorporated differently depending on model type and use.

### 2.1.6 Risk tolerances and thresholds

Throughout Phase II, risk tolerances and thresholds were emphasized for their importance in providing further transparency and understanding of decision-making, as well as more guidance on how to make decisions. The following questions were presented to guide further discussion:

- + How should utilities provide their assessments for their own internal risk thresholds/tolerances being used, both overall and at a project level, within the 2026-2028 Guidelines?
- + During WMP reviews, how should risk tolerances and thresholds be evaluated on what is acceptable?

SCE highlighted the CPUC Risk-based Decision-making Framework (RDF) proceeding and its white paper on tail risk and risk tolerance<sup>5</sup>, which they want the CPUC to adopt. They identified this as the #1 item for Phase 4 regarding wildfire and overall risk. While acknowledging transparency through GRC and RAMP filings and openness to additional guidance, SCE emphasized that establishing standardized risk tolerance is the role of the regulators—not utilities. Without regulatory direction, utilities would set their own thresholds, which isn't appropriate for a standardized approach.

MGRA agreed, stating regulators are overdue for public discussion on risk tolerances and thresholds, noting it's unfair to place this burden on utilities or the public.

GPI emphasized the need for top-down assessment from the CPUC and Energy Safety and referenced verbal comments on the climate adaptation proceeding, arguing that risk tolerance cannot be eliminated from decision-making tools. They questioned where these parameters should be addressed—whether in this forum, by Energy Safety, or through crosswalk opportunities—and noted that while utilities currently have internal risk tolerances (some more transparent than others), multiple thresholds being applied isn't appropriate as it changes mitigation types and costs. GPI advocated for prioritizing this issue, arguing that risk tolerance must be determined first to establish methods for measuring outputs across the landscape. They stressed that values should align with current modeling capabilities (e.g., linking "catastrophic wildfires" to 8-48 hour spread metrics) and work top-down so models can identify and meet established tolerances and thresholds.

SCE agreed with GPI and MGRA, adding that HFRA boundaries and HFTD designations for compliance and inspection standards should be considered. They suggested aligning risk tolerances with HFRA tranches to recognize areas with elevated or extreme risk requiring separate mitigation approaches. SCE noted that monetized MAVF could be attribute-specific and locational, acknowledging constant tradeoffs between factors—though they cautioned against tradeoffs like acres burned versus fatalities. They also mentioned prudence issues under AB 1054 for cost-recovery across proceedings.

The discussion concluded with recognition that this topic may be outside the working group's scope, raising questions about whether a workshop is needed and who should lead this effort, with consensus that CPUC engagement is necessary.

### 2.1.7 Wind modeling and weather scenarios

Throughout Phase II meetings, electrical corporations indicated that further transparency and expectations should be set to clarify the conditions for wind and weather scenarios used in their models. The following questions were presented to guide further discussion:

- + How can there be more transparency on which wind scenarios utilities are used as part of their modeling?
- + Should there be any standardization on what scenarios are evaluated?
- + How can 2026-2028 Guidelines provide more guidance on how scenarios are defined (worst weather days), how components are chosen (wind loads, gusts, weather), and how utilities understand both averages and tail risks as a result?

MGRA highlighted progress made by incorporating scenarios and recurrence intervals to address weather condition differences across service areas, using time windows to define "worst-case" events for each area. However, they emphasized the need to clarify how utilities apply these recurrence intervals to operational

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<sup>5</sup> [https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/safety-policy-division/meeting-documents/risk-tolerance-simple-optimization-level4-final\\_branded4\\_110124.pdf](https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/safety-policy-division/meeting-documents/risk-tolerance-simple-optimization-level4-final_branded4_110124.pdf)

versus infrastructure countermeasures. For example, if PSPS addresses risk in 1-in-100-year events through operational measures but Energy Safety mandates reducing both wildfire and PSPS risk, limiting acceptable mitigation to infrastructure (e.g., undergrounding for long timeframes) may not be optimal for public safety or cost-effectiveness—particularly considering affordability impacts. MGRA suggested specifying contingency plans for recurrence intervals, such as whether utilities can shut off power under certain conditions or must design infrastructure to withstand extreme events like 100 mph gusts.

### **2.1.8 Key Takeaways**

The key takeaways from this session are summarized as follows:

- + Consensus among stakeholders that risk model outputs should be included directly in the WMP submissions.
- + Standardization efforts should be emphasized for foundational elements such as risk planning thresholds/tolerances, definitions, conditions, inputs, and planning standards prior to addressing more nuanced components.
- + Risk tolerances and thresholds should be determined by regulators rather than by the electrical corporations prior to establishing methods for measuring outputs across the landscape.
- + Electrical corporations should clarify how recurrence intervals are applied to operational versus infrastructure countermeasures and specify contingency plans for whether power can be shut off under certain conditions or infrastructure must be designed to withstand extreme events.

## 2.2 04/24/24 – PHASE II OUTCOMES

This session built upon the first session, continuing to focus on outcomes from Phase II, with Energy Safety's prompts guiding the discussion toward understanding how WMP Guidelines could be revised for clarity purposes for each topic discussed in the first session. The takeaways from the 04/24/2024 RMWG meeting are included in the 03/20/2024 summary. Note that this summary only includes the overarching questions and discussion prompts provided by Energy Safety as follows:

- + Can and should there be standardization of any element(s) of this topic at this time?
  - If so, can and should any of these elements be addressed by revisions to the WMP Technical Guidelines?
    - If so, which are the elements that can be addressed by revisions? What sections of which documents should be revised and what are the recommended revisions?
    - If not, is there a different venue more appropriate for addressing? What venue?
  - If not, is additional information needed and does the topic warrant further exploration?
- + Should electrical corporations be evaluating portfolios of mitigations and/or mitigations in combination as part of the decision-making process?
- + Should electrical corporations be using probability distributions to account for the range of risks throughout service territories?
- + Should definitions for variables, components, and risks be consistent across electrical corporations and/or governing agencies?
- + Should factors such as fire suppression impacts, smoke impacts, ingress/egress, and climate change, all of which may still require additional information, be captured within the wildfire risk models and if so, how?
- + Should ignition risk components have greater consistency across electrical corporations' risk models?
- + Should electrical corporations track, calculate, and understand risks that span multiple models and may impact augmentation of risk as a result?
- + Should electrical corporations use risk tolerances and thresholds as decision-making tools?
- + Should further transparency be required and/or consistency be achieved across which wind and weather scenarios electrical corporations are using for various risk models?

## 2.3 06/26/24 – PHASE II TOPICS

This session focused on clarifying expectations for a Data Request (DR) issued to all participating electrical corporations prior to the meeting and discussing key differences between risk models that were highlighted by the DR responses. The DR aimed to reestablish a baseline understanding of electrical corporation wildfire risk models and inform future RMWG meeting topics. While a similar DR had been issued at the initial establishment of the RMWG, this version provided greater standardization for reporting format and required additional descriptions and details on submodels and model outputs. The purpose was to enable comparison of wildfire risk models by having electrical corporations provide or describe the following:

- + Visual depiction of various models used by the electrical corporation
- + Data usage broken down by model
- + Model descriptions including algorithms, inputs, outputs, etc.
- + Model output analysis and utilization
- + Collaboration amongst electrical corporations
- + Additional collaborations with other entities
- + Third-party and peer reviews of risk models

The electrical corporations' responses to the DR also served as the foundation for future RMWG topics and discussions, focusing on key differences between risk models to understand the feasibility of future synchronization

The following questions were provided to guide discussion regarding DR responses:

- + From electrical corporations:
  - Do responses provide a better cross-understanding of other electrical corporations' models?
  - Any additional recommended resources for participants to understand electrical corporations' risk models?
- + From all RMWG participants:
  - Any additional information needed to have a baseline understanding?
  - Were the responses useful? Suggestions for improvement?
  - Any missing topics or key background information?

### 2.3.1 Working Group Progress and Effectiveness

During this session, stakeholders raised critical questions about whether the working group discussions are producing actionable outcomes or simply revisiting topics already covered extensively in previous comments, Wildfire Mitigation Plans (WMPs), and earlier sessions. Participants strongly emphasized the need to develop concrete recommendations for next steps that focus on aligning core methods across utilities, while acknowledging that models inherently differ and various methodological approaches involve trade-offs. While consolidating information currently dispersed across WMPs and model documentation would provide value, participants noted that references to existing public documents should suffice given the substantial time and resources already invested in developing these models.

### 2.3.2 Regulatory Alignment and Coordination Challenges

Multiple electrical corporations emphasized the critical importance of aligning with the Risk-based Decision-making Framework (RDF) proceeding to avoid duplicating measurement approaches and ensure consistency across regulatory processes. Timing and coordination concerns emerged as significant challenges, highlighting the inherent tension between collaborative development of best practices and the practical constraints imposed by regulatory filing deadlines and limited resource availability. This tension is particularly acute during periods when multiple major filings (WMPs, RAMP submissions, and General Rate Cases) converge, stretching utility resources and potentially limiting meaningful engagement in working group activities.

### 2.3.3 Core Modeling Components and Foundational Questions

The working group continues to grapple with fundamental questions about which components should be included in Consequence of Risk Event (CoRE) models, with no clear consensus emerging on a single "right" approach. A central tension persists between focusing modeling efforts on risks utilities can directly control versus incorporating factors outside their control, such as weather patterns, fire suppression capabilities, and community preparedness levels. Multiple participants advocated for establishing foundational principles and defining bare minimum components for ignition risk assessment that can serve as a common baseline, rather than immediately pursuing comprehensive but potentially overcomplicated models. This approach reflects a pragmatic desire to establish common ground on essential elements before expanding into more complex or controversial modeling territory, while recognizing that legitimate differences in methodological approaches often stem from variations in service territories, vegetation types, topography, climate conditions, and other location-specific factors that cannot be standardized across all utilities.

### 2.3.4 Risk Assessment Philosophy and Tail Risk Methodology

Electrical corporations emphasized the critical importance of focusing on tail risk—extreme weather conditions and days that could produce consequential fires—rather than relying on average conditions or historical fire data alone. This approach recognizes that the primary objective is preventing catastrophic, potentially "utility-ending" fires, which necessitates clear and consistent definitions of what constitutes a catastrophic event. Importantly, tail risk varies significantly by location and cannot be adequately captured through systemwide averages; microclimates, topography, and fuel characteristics require discrete geographic modeling approaches. The mathematical methodology involves examining probability distributions of outcomes specifically on high-risk days rather than averaging across all conditions, since the overwhelming majority of risk weight concentrates in the tail of the distribution. This location-specific, tail-focused approach represents a fundamental shift away from relying primarily on historical fire patterns, which participants noted are inherently biased toward certain weather conditions, fire types, and suppression regimes that may not accurately reflect future risk under evolving climate conditions and changing landscape characteristics.

### 2.3.5 Wind, Fire Behavior, and Contextual Risk Factors

While wind velocity clearly increases both the likelihood of fire spread and the difficulty of suppression efforts, participants emphasized that it represents only one component of a complex risk equation. Fuel type, moisture content, spatial configuration of vegetation, and other environmental conditions all play critical roles in determining fire behavior and potential consequences. The interplay between these factors depends heavily on specific geographic contexts and local conditions, making standardized approaches challenging. Historical examples from fires in Laguna and Malibu demonstrate that highly consequential fires can occur on seemingly benign days with relatively low wind speeds, challenging simplistic assumptions about when risk is highest. Furthermore, factors not fully captured in current CoRE models, including egress route availability, communities

surrounded by wildland areas, evacuation time constraints, and access limitations for emergency responders—can significantly affect fire consequences even when fire behavior modeling suggests manageable conditions. This complexity underscores the substantial challenge of developing standardized methodological approaches that remain effective and accurate across diverse service territories, vegetation types, topographic conditions, and community characteristics while maintaining regulatory consistency and comparability across utilities.

### **2.3.6 Key Takeaways**

The key takeaways from this session are summarized as follows:

- + The RMWG should focus on producing actionable outcomes regarding alignment on core methods across electrical corporations.
- + The RMWG lacks consensus on CoRE model components.
- + Tail risk from extreme weather days that could produce catastrophic fires should be focused on rather than average conditions since risk concentrates in distribution tails and historical patterns may not reflect future climate conditions.
- + Wind can increase fire spread likelihood and suppression difficulty; it is only one factor impacting risk. There are historical examples showing consequential fires can occur on low-wind days.

### 3.0 Stakeholder Interviews

After the three RMWG meetings held in 2024, Energy Safety onboarded a new contractor, JH, to assist with facilitating the RMWG. The RMWG meetings from July 2024 through December 2024 were cancelled to onboard the new contractor and take time to focus on actionable outcomes, which was a key takeaway from Phase III. In an effort to receive feedback on the structure of the RMWG, interviews were conducted with ten groups of key RMWG members, including both electrical corporations and other stakeholders. Each group was provided with a set of guiding questions focusing on the RMWG structure, with additional model-specific questions posed exclusively to electrical corporations to capture their unique perspectives on technical implementation. A summary of the survey responses is provided below.

#### 3.1 RMWG STRUCTURE

Stakeholders identified several valuable takeaways from their involvement in the RMWG, including understanding how methods and implementation of new technologies or products differ across electrical corporations. Participants also valued more direct communication with the electrical corporations, with discussions generally proving useful, particularly for smaller utilities. External speakers were valued for providing insights into the state of current research and difficulty of implementing certain existing requirements.

When asked what success looks like for the RMWG, participants emphasized actionable outcomes related to each meeting, improving standardization by understanding the approaches for each risk model, and recommendations for changes to technical guidelines. Some participants suggested conducting benchmarking or validation studies as a successful outcome for the RMWG. Additionally, several participants agreed that the scope of the RMWG should be clarified to improve alignment between CPUC initiatives and other working groups.

#### 3.2 MODEL SPECIFIC QUESTIONS

RMWG participants identified several primary obstacles to including new features in their risk models, including availability of data, resources and training, as well as generally being early in the process of implementation. When asked about comparing risk across the industry as part of the RMWG, participants responded affirmatively, expressing interest in knowing what features and vendor products other utilities are using and how they are being applied. Regarding data sharing and benchmarking, participants noted that while all of the electrical corporations are using Technosylva and have previously conducted a benchmark study, they are using the data in different ways. Responses were mixed when asked whether demonstrations of specific components of risk models would provide useful collaborative discussion, with some participants supporting smaller breakouts for more open discussion and feedback when demonstrating what a specific component looks like for a particular service territory. Other participants noted that the consequence analysis would be difficult to demonstrate to significant differences in treatment among the electrical corporations.

#### 3.3 ADDITIONAL COMMENTS

Additional comments were shared in the stakeholder interviews. Of note, there was consensus among SMJUs that the RMWG was geared more toward the Large ECs (PG&E, SCE, and SDG&E), highlighting a need for better knowledge sharing across all utility types. Participants also reinforced the importance of focused and prepared meetings with clear objectives and defined topics to ensure productive discussions and actionable outcomes.

## 4.0 Conclusions and Recommendations

Some of the key conclusions and recommendations made by the RMWG participants during this phase of the RMWG are summarized below. Note that this list documents the general consensus of the RMWG at the time of these meetings and does not reflect a specific list of actions to be undertaken.

- + **RMWG Structure:** The RMWG is a useful forum for understanding how methodologies and implementations of new technologies or products differ between electrical corporation risk models. RMWG participants noted that the direct communication amongst electrical corporations, stakeholders, and external speakers was valuable in understanding these differences and the research available to inform their risk models.
- + **Standardization:** Standardization of definitions, risk planning thresholds and tolerances, scenario conditions, inputs, and planning standards should be prioritized to enable alignment of core elements between the risk models; however, the standardization should be established by a statewide, authoritative source rather than the individual electrical corporations. Although more nuanced standardization may be possible between models, it is noted that differences in methodological approaches may exist due to differences in service territory characteristics.
- + **Cross-Comparison of Wildfire Risk Models:** Energy Safety requested information from the electrical corporations to develop a baseline understanding of each risk model with the intent of identifying key similarities and differences between the models and assessing the feasibility of risk model standardization.
- + **Further Development for Various Components:** Consensus was reached that ingress/egress is more tractable than highly complex areas like fire suppression and smoke impacts, although all areas require additional research prior to integration into risk models. Electrical corporations also discussed that tail risk from extreme weather days that could produce catastrophic fires should be evaluated in addition to average conditions since risk concentrates in distribution tails and historical patterns may not reflect future climate conditions.
- + **Future Fuels:** A statewide, authoritative source should be given the responsibility of developing future fuelscapes and scenarios rather than delegating this task to each electrical corporation to conduct independently. The fuel layers and scenarios should be vetted by Energy Safety and the electrical corporations as part of standardization.
- + **Regulatory Alignment:** There was significant emphasis placed on the importance of aligning with regulatory proceedings (i.e. Risk Decision Framework) beyond the scope of the RMWG to avoid duplication of measurement approaches while ensuring consistency across regulatory processes.

## 5.0 Next Steps

Phase I and II of the RMWG covered a wide range of technical topics related to electrical corporation wildfire and outage risk modeling. These meetings focused on information gathering and knowledge sharing, including from outside experts, as various approaches used by the electrical corporations varied significantly at the start of the RMWG. The approaches used by the electrical corporations have started to converge in some areas, while continuing to evolve differently in other areas. As the electrical corporation risk models mature and become more stable, it has become more practical to establish areas of consensus or difference in wildfire and outage modeling approaches. Phase III of the RMWG mostly focused on how to use the information and discussions from Phases I and II of the RMWG to inform guidelines, as well as restructure the RMWG to move away from information sharing into reaching tangible conclusions that could be used to inform risk modeling moving forward.

The focus going forward in Phase IV is to develop a document that will summarize approaches and potential best practices for electrical corporations for modeling the wildfire risk to the public from their equipment. This document will summarize the discussions of the RMWG and the modeling approaches presented by the electrical corporations in their WMPs. The document will serve as guidance for how to conduct the analyses and present the results for review by other stakeholders. Areas where consensus has been reached on approaches will be documented and recommended for use. Areas where there is no consensus on approaches will be discussed with recommendations made on the comparisons needed to justify an individual practice. Areas where future developments are needed in order to improve will be summarized with recommendations made for potentially responsible parties in driving these improvements. The objective is to document areas where there is and is not consensus in wildfire and outage risk modeling approaches with discussion around why one approach may be used over another, as well as discussion of areas that need continual improvement and possible paths forward.

This document will be developed through Phase IV (2025) and Phase V (2026) of the RMWG. All electrical corporations and stakeholders will have the opportunity to provide input on the approaches document as it is being developed. There will be RMWG meetings to go over technical topics to be included in the approaches document. The intent is to have two primary topics in each meeting. The first topic is a technical discussion by electrical corporations or stakeholders clarifying key points on different approaches. The second topic is a summary of the approaches section drafted since the previous meeting. Remaining meetings will review the document as a whole and how it will be integrated into the broader WMP Guidelines.