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Subject: The Wildfire Safety Division's Proposed Strategic Roadmap

INTRODUCTION

On May 11, 2020, the Wildfire Safety Division (WSD) issued a draft strategic plan entitled, *Reducing Utility-Related Wildfire Risk: Utility Wildfire Mitigation Strategy and Roadmap for the Wildfire Safety Division* (Draft Strategic Roadmap). The WSD invited stakeholders to submit comments by June 30, 2020.

The Public Advocates Office at the California Public Utilities Commission (Cal Advocates) respectfully submits these comments on the Draft Strategic Roadmap report. Cal Advocates appreciates the opportunity to provide input and makes the following recommendations:

- The WSD should place more focus on evaluating wildfire modeling methods.
- The WSD should require the electrical corporations to provide metrics that show whether they are relying on short-term or long-term solutions.
- The WSD should use standard terminology for types of performance metrics.

DISCUSSION & RECOMMENDATIONS

A. The WSD should place more focus on evaluating wildfire modeling methods.

The Draft Strategic Roadmap should place more focus on the importance of sound wildfire risk modeling methods. The Draft Strategic Roadmap report correctly recognizes the need for utilities[1] to perform detailed assessments of wildfire risks.[2] The Draft Strategic Roadmap also notes that modeling plays a role in estimating wildfire risks, stating that the wildfire mitigation plan (WMP) guidelines "incorporate risk analysis and scenario modeling."[3] However, the Draft Strategic Roadmap does not acknowledge the critical step of reviewing the modeling methodologies and the assumptions that underlie them. This omission could lead to the faulty presumption that wildfire models used by the utilities or other entities are valid.

The WSD should include *improving and developing sound models to understand wildfire risks* as a key priority in the risk assessment portion of its final strategic roadmap. Developing robust and unbiased risk models is essential for understanding the wildfire risks that utilities face. Electric utilities are using models for at least three purposes: First, to estimate the likelihood that utility equipment will ignite a fire,[4] [5] given specified weather conditions; second, to understand how a fire will spread if one ignites in a specific location; and third, to understand the damages (including injuries, fatalities and firefighting costs) that are likely to occur if a fire burns in a specific location.[6]

A risk model uses observed data to make predictions. Good modeling practice requires reasonable and sensible assumptions, sound methods,[7] and good data. The Draft Strategic Roadmap provides substantial detail on data strategy without giving sufficient

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[1] In this section, we refer to utilities, because the issue of wildfire modeling primarily pertains to electric utilities rather than independent transmission owners.

[2] Wildfire Safety Division and Boston Consulting Group, *Reducing Utility-Related Wildfire Risk: Utility Wildfire Mitigation Strategy and Roadmap for the Wildfire Safety Division,* May 2020 (Draft Strategic Roadmap), pp. 37-38.

[3] Draft Strategic Roadmap, p. 38.

[4] Ignition probability can be estimated at the circuit level or at a more granular level.

[5] To date, utilities use machine learning algorithms to develop statistical equations that fit observed data. These statistical equations attempt to model the behavior of the utility assets. These statistical equations may help predict future asset performance and failure, but do not necessarily explain the physical processes behind the failure mode of the equipment, as correlation does not imply causation. Also, even if the modeled equation fits all the observed data points, the model can have problems of overfitting. That is, the model may fit only a limited set of data points and may not fit other data points.

[6] Southern California Edison Company's 2020 Wildfire Mitigation Plan (Revision 3), March 18, 2020, pp. 42-46.

[7] Sound methods include application of the correct physics equations and testing various statistical or machine learning algorithms.

consideration to the need to review utilities' modeling assumptions and methods. This could lead to an imbalance of quality, in which good data is fed into a flawed model, producing dubious outputs.[8] If the utilities' modeling assumptions and methods are flawed, even the best data will not produce accurate and informative results.

Cal Advocates recommends several actions to ensure that wildfire risk models are well developed. First, the WSD should require electric utilities to submit their wildfire models for review by a scientific advisory panel.[9] Review by third-party experts will scrutinize the modeling methods and assumptions, and identify areas where improvement is most needed. The Wildfire Safety Advisory Board also has stressed the need for an independent panel of scientists to review modeling methods and assumptions.[10]

Second, the WSD could leverage the technical expertise of stakeholders who are already engaged with utility wildfire mitigation work. Cal Advocates has recommended establishing a technical working group for parties to provide input on utilities' wildfire models.[11] This technical working group could either be part of the independent advisory panel mentioned above or a separate group.

Third, the WSD should require utilities to demonstrate the results (e.g., the robustness) of their wildfire models.[12] Since the electric utilities are relying on wildfire models to make crucial decisions (such as where to invest in mitigation measures or where and when to de-energize circuits), it is important that the models produce a sound and unbiased understanding of real-world wildfire risks. The utilities have yet to share many important modeling results and demonstrate how close their predicted results are to the observed data.[13] Flawed models can lead to bad decision-making.

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[8] It is also possible to feed flawed data into a good model, or flawed data into a flawed model. However, given the Draft Strategic Roadmap's focus on the data strategy, our immediate concern is that the quality of the data may exceed that of the models.

[9] This panel should comprise qualified experts from industry, academia, and government.

[10] Wildfire Safety Advisory Board, *Recommendations on the 2021 Wildfire Mitigation Plan Guidelines, Performance Metrics, and Safety Culture*, June 24, 2020 (Wildfire Safety Advisory Board 2021 Recommendations), Recommendation 3.1, p. 26.

[11] Comments of the Public Advocates Office on the 2020 Wildfire Mitigation Plans, April 7, 2020, p. 58.

[12] Comments of the Public Advocates Office on the 2020 Wildfire Mitigation Plans, April 7, 2020, pp. 57-59.

[13] See, e.g., *Pacific Gas and Electric Company (PG&E) Reply Comments on the 2020 Wildfire Mitigation Plans*, April 16, 2020, pp. 22-23: "the approval of the 2020 WMP should not be contingent on making a detailed showing of model accuracy." San Diego Gas & Electric Company (SDG&E) states that its "approach to modeling … has been audited by external auditors." However, as far as Cal Advocates is aware, SDG&E has not shared the result of these audits. SDG&E does not indicate that it has provided any information to the Commission or the WSD to demonstrate the validity of its wildfire models. *San Diego Gas & Electric Company Reply Comments on the 2020 Wildfire Mitigation Plans*, April 16, 2020, p. 16.

Finally, each electric utility is currently developing and using wildfire models separately. The WSD should encourage knowledge exchange among utilities and other stakeholders to improve the robustness of all wildfire models. This would be consistent with the Commission's requirements for providing parties access to models in proceedings,[14] and consistent with the Wildfire Safety Advisory Board's recommendations.[15]

B. The WSD should require the electrical corporations to provide performance metrics that show whether they are relying on short-term or long-term solutions.

The Draft Strategic Report calls for developing "a set of metrics to evaluate utility implementation" of WMPs and provides six principles for metrics.[16] The WSD should add a seventh principle: metrics should elucidate whether electrical corporations[17] are relying on short-term or long-term approaches to address wildfire risks.

Currently, the WMP guidelines require electrical corporations to report customer-hours of planned outages (including de-energization events) and customer-hours of unplanned outages (excluding de-energization events).[18] A separate table includes customer-hours of outages due to de-energization,[19] but the electrical corporations are not required to identify other causes of planned outages. Planned outages may be due to implementation of system hardening measures, conventional system maintenance, or intentional de-energization to prevent wildfire ignition (which should be used as "a measure of last resort").[20]

Future WMP guidelines should require the electrical corporations to disaggregate their customer-hours of planned outages by cause: de-energization, outages due to wildfire mitigation work, and outages due to other maintenance work. This breakdown will clarify how much electrical corporations are relying on de-energization (a short-term solution) versus system hardening (a long-term solution) to reduce wildfire risks. While

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[14] Commission Rules of Practice and Procedure, Rule 10.4(b).

[15] Wildfire Safety Advisory Board 2021 Recommendations, Recommendation 3.1, p. 26.

[16] Draft Strategic Roadmap, pp. 36-37.

[17] In this section, we refer to electrical corporations, because all electrical corporations are required to provide metrics as part of their wildfire mitigation plans. Eight electrical corporations submit wildfire mitigation plans pursuant to Public Utilities Code Section 8386.

[18] *Administrative Law Judge's Ruling on Wildfire Mitigation Plan Templates and Related Material and Allowing Comment*, December 16, 2019 (2020 WMP Guidelines), Table 2, lines 3a and 3d.

[19] 2020 WMP Guidelines, Table 12.

[20] Decision (D.) 19-05-042, Appendix A, p. A1, which states that "[t]he electric investor-owned utilities must deploy de-energization as a measure of last resort and must justify why de-energization was deployed over other possible measures or actions" as one of the Commission's Overarching Guidelines for de-energization.

de-energization may reduce ignition risk in the short-term, it also imposes substantial costs on customers without mitigating the underlying risks that cause wildfires. Hardening infrastructure in high-risk locations is a more effective long-term approach to prevent wildfires. Therefore, Cal Advocates expects that electrical corporations will report decreases over time in customer-hours of planned outages due to de-energization.

To this end, the WSD should require electrical corporations to submit metrics that show the causes of service disruptions.

C. The WSD should use standard terminology for types of performance metrics.

The Draft Strategic Roadmap refers to three types of metrics: progress metrics, program targets, and outcome metrics, which are each defined in the Draft Strategic Roadmap.[21] The WSD should revise this terminology.[22]

The terms "progress metric" and "program target" are not well defined in the Draft Strategic Roadmap. As defined, there is no evident difference between the two terms. Indeed, the Draft Strategic Roadmap states that program targets can be used to "track progress,"[23] which adds to the confusion.

To remedy this problem, the WSD should use familiar, standard terms for types of metrics. It is common to classify metrics as inputs, outputs, and outcomes.[24] The WSD should add risk metrics to this schema, since risk is a distinct concept. (Risk is not an outcome; it is the expectation of future outcomes.)

Cal Advocates recommends the following definitions for types of metrics:

- Inputs are the resources used (for example, money or hours of labor).
- Outputs are the activities completed (for example, the number of trees trimmed).
- Outcomes are the results that matter (for example, the number of wildfires caused by utility assets).

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[21] Draft Strategic Roadmap, p. 36.

[22] Cal Advocates previously noted this issue in the *Comments of the Public Advocates Office on Draft Resolutions WSD-002 through WSD-009 Regarding Wildfire Mitigation Plans*, May 27, 2020, pp. 6-7.

[23] Draft Strategic Roadmap, p. 36.

[24] See, e.g., https://impact-evaluation.net/2013/06/10/difference-between-inputs-activities-outputs-outcomes-and-impact/ and https://kpi.org/KPI-Basics/KPI-Development

- Risk is a forward-looking estimate of expected outcomes (defined as the probability of an event occurring multiplied by the consequence of the event).[25]

Lastly, targets are different from metrics. A metric is a quantitative measure that is used to track a specific type of activity or performance. A target is not a metric, but rather a desired level to achieve on a metric.

- A target is a goal or desired level that one aims to achieve on any metric, whether it is an input, output, outcome, or risk metric. For example, a utility may set targets of trimming 10,000 trees per year and having zero utility-caused wildfires.

The WSD should use standard terms for metrics to clearly communicate its expectations regarding performance metrics.

CONCLUSION

The Public Advocates Office respectfully requests that the WSD adopt the recommendations contained herein.

Respectfully submitted,

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[25] Ranganathan, Priya et al. "Common pitfalls in statistical analysis: Odds versus risk." Perspectives in Clinical Research vol. 6, 4 (2015), 222-224. doi:10.4103/2229-3485.167092.