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COMMENTS OF THE GREEN POWER INSTITUTE ON RISK SPEND EFFICIENCY AND THE RISK SPEND EFFICIENCY WORKSHOP

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The Green Power Institute (GPI), the renewable energy program of the Pacific Institute for Studies in Development, Environment, and Security, provides these *Comments of the Green Power Institute on Risk Spend Efficiency and the Risk Spend Efficiency Workshop.*

I. Comments

GPI appreciates the OEIS decision to host the December 9, 2021, workshop on IOU Risk Spend Efficiency (RSE) calculation methodology and application. This workshop provided much needed additional detail regarding how each IOU is calculating RSE values for each mitigation activity. However, while the IOU presentations filled in some information gaps in the RSE calculation methodology there are still substantial informational gaps regarding RSE inputs, assumptions, and calculation methods for each mitigation by each IOU. We address the following topics in our comments:

- RSE calculation method alignment and RSE comparability across IOUs is a reasonable expectation.
- There is still insufficient transparency to effectively compare RSE calculation methodologies across IOUs.
- Reference or standardized example mitigation scenarios may help to elucidate method variability and eventual convergence.
- It may be appropriate to adopting a single MAVF method specifically for wildfire mitigation planning.
- Change in LoRE and CoRE terms are foundational to RSE calculations. A more detailed assessment of LoRE and CoRE quantification, as well as method alignment is needed to validate RSEs and is within the scope of the Wildfire Mitigation Plan development process.

- Granular baseline risk maps informed by machine learning approaches are being developed in the WMP and may be capable of informing RSE tranche granularity.
- RSE confidence interval and data-informed status.

RSE calculation method alignment and RSE comparability across IOUs is a reasonable expectation.

GPI agrees that RSE valuation methodologies should be relatively comparable across IOUs and Utilities in general. This is a reasonable expectation given that RSE valuation is a construct that includes multiple valuation steps, each of which should be expected to fall within best-practices methodology. RSE valuation best practices from a broad perspective should include quantitative data-driven inputs and assumptions to the maximum extent possible. Drilling down into each term of the RSE calculation, best practices can, for example, reasonably include standardized constants (e.g. After Tax weighted cost of capital discount percentages), standardized MAVF scaling functions, and standardized units (e.g. millions of dollars).

GPI also suspects that current practices for grouping, evaluating and quantifying mitigation effectiveness, including both risk frequency and consequence reduction, varies substantially across Utilities. Methods for quantifying risk event frequency and consequence reduction (e.g. mitigation effectiveness percentages) should be subject to detailed assessment, vetting, and unified best practices. The three apparently disparate RSE methods applied by the IOUs provide a range of methodologies that can likely inform current best practices, which once adopted can lead to methodological convergence.

There is still insufficient transparency to effectively compare RSE calculation methodologies.

Efforts by Mussey Grade Road Alliance (MGRA) to compare and elucidate differences among RSEs across the IOUs were unsuccessful based on the data and information available in past WMPs. As a result, RSE value calculation and vetting efforts have remained relatively opaque. The December 9, 2021, workshop provided some additional

insight into the IOUs' RSE calculation methods, vetting and application approaches. However, GPI is concerned that there is still very limited transparency into how IOUs are calculating RSE inputs, including mitigation-adjusted LoRE, adjusted CoRE, and the MAVF.

PG&E provided what appears to be the most comprehensive report on their RSE method in the supplemental "Pacific Gas and Electric company RSE lite tool documentation and user guide," filed on December 17, 2021. Our initial review suggests that it provides additional detail on their RSE methodology and calculations including Tranche level RSE calculations, and a rubric-type approach to determining program effectiveness caps based on impact to frequency drivers and consequence (i.e. Table 1 and 2, PG&E Company RSE lite tool documentation and user guide, p. 21-22, data not shown). In general, this document provides substantial additional detail beyond the contents of the workshop slides. It also goes beyond the content provided in mandatory December 17, 2021, post workshop reports, which are effectively summaries of the IOU presentations.

SCE and SDG&E did not provide equivalent internal documentation or user guides describing internal company methodologies and guidance for RSE development. GPI recommends requiring that all IOUs develop similar internal documentation and user guides, and that those methods be made publicly available in the WMP OEIS docket.

In general, substantial transparency gaps in the described RSE methods include, but are not limited to:

- Variability in the MAVF methods across IOUs including the actual equation for the scaling functions, not simply linear versus non-linear descriptors of scaling functions. GPI does, however, acknowledge that the MAVF is a method developed in the CPUC RAMP proceeding, where there is additional documentation on MAVF details and development.
- Little-to-no insight on how mitigation effectiveness, and therefore change in risk event frequency and consequence – and therefore delta LoRE and delta CoRE - is

determined for each mitigation, including inputs, assumptions and results. Mitigation effectiveness percentages are not provided for each mitigation activity.

- The scalars used to adjust RSE values to "readable" values (i.e. 10^3, 10^6 and 10^9) and the underlying calculations that require these scalars.
- The tranche levels applied to each RSE calculation.

We address some of these informational gaps in additional detail below.

Reference or standardized example mitigation scenarios may help to elucidate method variability and eventual convergence.

Examples provided in the IOU presentations were helpful for understanding how each IOU calculated their RSE. However, each of these examples were highly variable across the IOUs, with the result that calculations at each step of the RSE methodology are not directly comparable.

GPI recommends establishing or requiring the IOUs to establish reference risk mitigation scenarios or examples that all IOUs would use as a starting point for calculating a set of RSE values. Each IOU would use the refence conditions in example RSE calculations for which they would also provide all mathematical steps and describe any SME inputs. For example, a reference risk mitigation scenario could include conditions such as a specific mitigation (e.g. covered conductor installation) applied to a circuit with defined properties (e.g. defined assets, length etc.) and defined initial risk driver frequency, Technosylva-derived consequence conditions, and environmental attributes. Alternatively, and more simply, the reference scenario could specify pre- and post-mitigation risk frequency and consequence parameters.

Each utility would then pass the reference scenario through their RSE valuation method and report on all steps of the quantification process as well as the final result. Using a reference mitigation scenario would allow direct comparison between IOU methods for multiple aspects of the RSE valuation process. A scenario that defines a limited set of environmental parameters would provide insight on how each IOU is determining risk

frequency and consequence reduction. Alternately, defining a pre- and post- mitigation risk frequency and consequence would focus insights on how other inputs and assumptions, especially the MAVFs, alter the final RSE value. Performing RSE calculations on the same reference risk mitigation scenario(s) with each RSE methodological update will indicate whether and how RSE calculation adjustments are resulting in a convergence of RSE outputs and comparability.

Since all Utilities are using RSE values as unitless, relative ranking values it may be feasible to adopt a single MAVF method specifically for wildfire mitigation planning and/or standardize many, if not all, RSE calculation constants.

GPI agrees with other parties that variability among IOU MAVFs is likely a major source of variability among RSE results for similar mitigations. Since the MAVF function is scoped in the CPUC RAMP proceeding, adjustments to the IOUs enterprise-wide MAVF should be established therein. Requests from OEIS to the CPUC could help guide these changes in the RAMP proceeding.

In the WMP development process, relatively comparable RSE values for defined mitigation activities would allow third parties, stakeholders, customers, the OEIS, and the IOUs to better assess and compare the relative risk buydown potential and appropriate scope of mitigation deployments. GPI questions whether the OEIS can establish a common MAVF specifically for application to wildfire risk mitigation activities that will ultimately improve RSE comparability. While cross-risk comparability across utilities is ideal (e.g. activities leading to simultaneous wildfire mitigations and reliability improvements), cross-utility comparability will help elucidate the efficacy of wildfire mitigation activities in a time when efficient deployment and risk buydown is paramount to protecting Californians lives and property. IOUs in the RSE working group should report on and justify whether or not a unified MAFV could be adopted for wildfire mitigation planning at the activity level and for locationally-granular risk assessments.

To our understanding, the RSE values currently developed for wildfire mitigation planning and presented in the workshop are unitless values that are by-and-large used to inform

relative ranking of various risk mitigation activities. The Utilities repeatedly state that these unitless values are used as one of many considerations when deciding on the location, scope and mitigation value of a given mitigation activity (e.g. see SCE December 9, 2021, Slide 17). RSE values do not appear to be used as a conversion factor, multiplier or any other quantitative input into downstream calculations that determine the *quantitative* scope of a particular mitigation. That is, RSE values appear to have limited quantitative power to directly inform the extent to which a given mitigation should be deployed and the cost effectiveness of that mitigation.

Based on the relativistic application of RSE values we suspect that standardizing RSE input constants (e.g. 3 versus 7 percent *After-Tax Weighted Average Cost of Capital*), to the same values across all utilities might not substantially change the relative ranking of each IOU's resultant RSE values. That is, standardizing RSE calculation constants for all utilities could have minimal-to-no impact on the influence and interpretation of RSEs in the mitigation selection process. Establishing a standard set of RSE input constants, including for the MAVF, could therefore mark an easy first step towards improving cross-utility comparisons while maintaining each utility's RSE relative rankings.

Utilities in the RSE working group should provide an example of their RSE values with and without standardized constants and explain whether it is feasible to standardize RSE calculation constants across Utilities.

Change in LoRE and CoRE terms are foundational to RSE calculations. A more detailed assessment of LoRE and CoRE quantification, as well as method alignment is needed to validate RSEs and is within the scope of the Wildfire Mitigation Plan development process.

GPI is concerned that much of the focus regarding RSE variability between IOUs is focused on the MAVF. However, the MAVF is effectively a lens or conversion function that CoRE values are passed though in order to develop a unitless risk ranking. Once the MAVF is standardized the validity of the RSE output is largely dependent on inputting an appropriate $\Delta\, CoRE$ and $\Delta\, LoRE$. That is, standardizing the MAVF across utilities will not

remedy fundamental RSE discrepancies or, perhaps more importantly, RSE functionality, if foundational inputs such as change in risk frequency and consequence are flawed.

Risk mitigation efficacy, which includes change in risk event frequency and consequence, determine the fundamental RSE variables $\Delta\, LoRE$ and $\Delta\, CoRE$. The validity of these terms therefore determines the usefulness of the RSE value. GPI recommends placing substantial focus on evaluating how IOUs are determining mitigation effectiveness in terms of both change in risk event frequency and consequence.

Change in LoRE – The IOUs provide minimal insight on how mitigation effectiveness in terms of risk event frequency reduction, and therefore change in LoRE, is determined for each mitigation. LoRE values were described as reflecting a mix of data-informed and SME-informed valuation that leads to a percent effectiveness, or risk reduction. However, the extent to which data is used to inform the effectiveness of each mitigation under a given set of baseline or risk conditions is not transparent. That is, some mitigation-adjusted LoRE values may be well grounded in data, while others may be based solely on SME estimations or best guesses. It is entirely opaque as to which mitigation activities have risk frequency reduction effectiveness percentages that are wholly or partially informed by data, versus the relative contributions of SME-driven effectiveness estimations. The quantitative (data-driven) and qualitative (SME-driven) methods and considerations for determining risk driver frequency reductions for each mitigation are also not publicly available.

Change in CoRE – The utilities note that change in CoRE is based on Technosylva outputs. However, it is similarly obscured how each IOU is determining the extent to which each mitigation can reduce the consequence of risks, and therefore change in CoRE. That is, is it not clear whether the baseline risk results from Technosylva match-drop outputs are adjusted based on a percentage of the baseline CoRE (e.g. mitigation A will reduce property damage by 50 percent) or some other methodology (e.g. rerun the match-drop analysis with updated, post-mitigation assumptions).

While the IOUs provided examples of mitigation effectiveness percentages as well as change in CoRE and LoRE values in their presentations, these embedded values cannot be determined based on RSE scores provided in the December 17, 2021, excel filings. Rather, these fundamental risk-frequency and consequence-reduction effectiveness percentages are wrapped within total risk-reduction scores that include multiple other inputs and assumptions (e.g. MAVFs, lifetime of mitigations, and undefined tranche granularities).

The most transparent description of mitigation effectiveness percentages for change in risk frequency and consequence are provided by PG&E in Table 1 of their *PGE Company RSE lite tool documentation and user guide* (Filed December 16, 2021, p. 21-22, data not shown). GPI recommends requiring that all IOUs provide a breakdown of how they determine change in wildfire risk frequency and consequence for each mitigation activity. This breakdown should minimally include the quantitative values used in the RSE valuation, methods and sources use to arrive at the quantitative value (e.g. data-informed, SME-informed, mitigation effectiveness score caps or tables etc.), and confidence in the risk-reduction value (e.g. low, medium, high).

Granular baseline risk maps informed by machine learning approaches are being developed in the WMP and may be capable of informing RSE tranche granularity.

The workshop panel discussion noted that a third-party proposed application of machine learning to discern and define appropriate RSE tranche granularities. The granular, baseline wildfire risk maps under development use machine learning to identify and extrapolate granular probability of ignition, (e.g. LoRE), which is then multiplied by the granular CoRE value (i.e. the Technosylva consequence output passed through the MAVF). To our knowledge all IOU machine-learning-derived probability of ignition values are now based on granular risk-event datasets, not just ignitions. These models seek to identify how wildfire risk events are correlated to environmental events and locational attributes (e.g. wind speed, vegetation, equipment properties etc.) and the predictive power of those variables. These machine-learning-derived baseline POI models as well as granular CoRE results may be suitable for informing RSE valuation tranches.

GPI recommends tasking the IOUs with exploring whether and how the already in-progress machine-learning-based granular risk models can inform RSE valuation tranches and tranche granularity. For example, locations with a set of attributes determined to have high predictive power for a given risk driver (e.g. tree coverage and wind speeds linked to contact from vegetation ignitions and near misses) could be grouped into an RSE valuation tranche for a specific set of mitigations (e.g. covered conductor and EVM).

PG&E was the only IOU to mention applying tranche-based RSE analyses to their overall RSE valuation for each mitigation. In general, All IOUs should report in the 2022 WMP whether they evaluate RSE within tranches and how the tranches are determined and defined for each mitigation.

RSE confidence interval and data-informed status

IOUs are proposing to provide relative confidence levels (e.g. high, medium, and low) for various inputs into the RSE calculation. GPI generally supports this approach as an initial assessment that will inform which terms within the RSE calculation merit the most attention and refinement. We suspect that foundational change in LoRE and change in CoRE values may have low confidence rankings. In contrast, MAVF functions and constants, while variable across utility methods, might be deemed exempt from confidence ranking or ascribed high confidence rankings since they are effectively defined conversion factors. GPI strongly recommends requiring that IOUs provide a justification for how and why they rank the confidence of each term in their RSE calculation for each mitigation. IOUs should also provide a plan and timeline for how they will improve low confidence RSE input values. For example, a mitigation effectiveness percentage ascribed a confidence ranking should be accompanied with an explanation as to the extent of data-informed versus SME evaluation, the evaluation method and source, and how and by when they will improve the estimation confidence.

This information will also support RSE validation and verification efforts. For example, IOUs that report higher confidence in change and LoRE and CoRE values than others

might identify areas of improvement or collaboration that inform and improve RSE estimates for all utilities.

II. Conclusion

For the reasons stated above, we urge the OEIS to adopt our recommendations herein.

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Respectfully Submitted,

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