BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Wildfire Safety Division
California Public Utility Commission

COMMENTS OF THE GREEN POWER INSTITUTE ON THE 2020 WILDFIRE MITIGATION PLANS

April 7, 2020

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Pursuant to the January 24, 2020, Resolution WSD-001, the Green Power Institute, the renewable energy program of the Pacific Institute for Studies in Development, Environment, and Security (GPI), provides these Comments of the Green Power Institute on the 2020 Wildfire Mitigation Plans.

General Comments on Wildfire Mitigation Plans

Applying a Risk Bowtie Analysis and RSE Values

The bowtie risk analysis and risk spend efficiency (RSE) values are fundamental to developing and prioritizing WMP activities. First and foremost the bowtie risk analysis is a foundational and robust tool for identifying risk-event causes and impacts, as well as the preventative, detective, and corrective controls needed to either eliminate the occurrence of a risk event (i.e. wildfires), or mitigate its impacts. Despite this the IOUs generally gloss over their bowtie risk analyses for wildfire prevention and mitigation and generally fail to connect how the bowtie analysis informed the determination of their RSE values, the proposed WMP activities, and activity prioritization.

The cost effectiveness of a risk reduction control is also dependent on the point at which the control is enacted along the progression of a bowtie risk analysis, from causes to events to impacts. For example, front loading resources to substantially reduce the chance of ignition (e.g. vegetation management or covered conductors) can result in a much lower impact cost (e.g, ignition does not happen) compared to wildfire detection systems, for example, that alert Utilities to the occurrence of a wildfire event that is already causing negative and costly impacts. That is, preventing a wildfire from happening versus responding to a wildfire that has already ignited has additional risk-spend efficiency value beyond just the cost of the initiative. All types of wildfire mitigation controls (e.g. preventative, vs. detection) are important. However, utilities should provide a discussion

on how each WMP activity addresses specific causes, events, and impacts along the wildfire-risk bowtie analyses, and how the mitigated cost contributes to the resource allocation and prioritization of that activity.

PG&E provides the most comprehensive summary of their bowtie and MAVF analyses as it relates to WMP activities, but still lacks the information necessary to connect the results of the analysis to their proposed WMP activities. Notably, the only figure displaying a bow tie analysis is essentially illegible (PG&E 2020 Revised WMP, p. 4-7), and the connection to specific WMP activities is weak:

> PG&E developed its S-MAP conforming bowtie for the wildfire risk by creating separate tranches for HFTD and non-HFTD areas. The higher risk scores and Risk Spend Efficiency values for mitigations in the HFTD areas enables a clear case for prioritization of wildfire mitigation initiatives in HFTD areas (PG&E 2020 revised WMP, p. 4-9).

And

> When performing a risk analysis of a single, specific risk, like wildfire, PG&E focuses narrowly on the mitigations that benefit (reduce) that risk, either by reducing likelihood of an event or by reducing consequences of an event. Therefore, mitigations identified to reduce wildfire risk may or may not also benefit other risks that have safety and/or reliability impacts, such as asset failure. Each risk is assessed using a "bowtie analysis" (the wildfire risk bowtie analysis is provided in Section 4) with the mitigation activities that benefit a risk identified in those analyses. The risk bowtie analyses conform to requirements in the S-MAP settlement; risk bowties for risks that are deemed a RAMP risk will be presented in PG&E's 2020 RAMP Report, which will be submitted to the Commission in June (PG&E 2020 revised WMP, p. 5-4).

PG&E appears to have most successfully integrated a bowtie risk analysis into the development of their WMP. However, the connections between the results of the risk bowtie analysis, RSEs and the proposed WMP activities remain unclear. For example, PG&E provides a list of the "Macro Trends Impacting Ignition Probability and Wildfire Consequences with PG&E's Ability to Influence" in WMP section 4.2.1 but does not explain or provide a relative priority ranking. We further note that PG&E only provides RSE values for four initiative activities (PG&E 2020 WMP, Tables 23-31).

SCE's 2020 WMP refers to a bowtie analysis in general terms in three instances, one of which states that:

> Consistent with the S-MAP framework, SCE's 2020-2022 WMP employs a MAVF and a risk bowtie approach, which links mitigations to drivers and/or outcomes for safety, reliability, and financial dimensions for enterprise level risk analysis, and as discussed below, more granular asset level models for deploying mitigations within programs (SCE 2020 revised WMP, p. 35).

SCE's clearest application of a "bowtie-like" analysis is their deployment of the Wildfire Risk Model (WRM), which: "utilizes a similar risk bowtie approach as described in RAMP, but builds upon that approach by localizing the drivers, outcomes, and consequences to specific circuit and circuit segments (SCE 2020 revised WMP, p. 42)." The two listed outcomes of the WRM analysis are the re-prioritization of covered conductor deployment in high risk areas, and to inform the High Fire Risk-Informed Inspections (HFRI) program. However, there are a plethora of additional WMP activities, from vegetation management to other system hardening initiatives, which SCE fails to connect or associate with a foundational and comprehensive bowtie analyses.

SDG&Es 2020 WMP is even more vague in terms of the extent to which a thorough risk bowtie analysis was conducted and, how the activities in the WMP were informed by the analysis. They include one generalized reference to their risk bow tie analysis:

> …the Enterprise Risk Management organization works with various business units to update existing risk information and identify enterprise-level risks that have emerged or accelerated since the prior assessment. This part of the process also includes the identification of risk events, their causes, and potential consequences, which is summarized in a Risk Bow Tie. The Risk Bow Tie is "a tool that consists of a Risk Event in the center, a listing of drivers on the left side that potentially lead to the Risk Event occurring, and a listing of Consequences on the right side that show the potential outcomes if the Risk Event occurs." Risk evaluation is also included in SDG&E's enterprise risk management process. It results in a pre-mitigation risk score. As explained in Section 4.2, the methodology or framework utilized by SDG&E to calculate risk scores, including for the Wildfire risk, was adopted in the S-MAP (D.18-12-014) and presented in SDG&E's 2019 RAMP (SDG&E 2020 Revised WMP, p. 177).

We are additionally concerned with the preponderance of references to the role of subject-matter experts in assessing and determining SDG&E's WMP activities, investments, and prioritizations. For example, SDG&E states that:

> The capital allocation planning sessions begin with input from functional capital committees that comprise subject matter experts who perform high level assessments of the capital requirements based on achieving the highest risk mitigation at the lowest attainable costs. These requirements are presented to a cross-functional team representing each functional area with capital requests.

While they do refer to using an enterprise-wide MAVF "for evaluating capital investments through a data-driven, quantitative risk- and safety-based lens (SDG&E 2020 Revised WMP, p. 146)," this verbiage is generalized and does not indicate that a wildfire-risk focused mitigation assessment is a dominant component underlying the development of asset management and other investment allocations.

The IOUs were required to develop and implement risk-mitigation tools and frameworks in the S-MAP/RAMP proceeding. While the IOUs reference using these tools to evaluate and address wildfire mitigation activities in the WMPs, they fail to provide a clear description of the outcomes of risk mitigation bowtie analyses and MAVFs as they pertain to wildfires, and in regards to how they are driving WMP activity prioritization and cost/resource allocation. The relatively new RSE method is also used sparingly, and it is not clear how the RSE factored into selecting the proposed WMP activities. The GPI recommends that future WMPs should include the IOUs' complete wildfire risk bowtie assessment, including all possible identified causes, events, impacts, and possible controls. In addition, IOU WMPs should clearly indicate how their foundational wildfire risk bowtie analyses, MAVF and RSE results informed and are factored into determining WMP activities, expenditures, and prioritization. Customers, stakeholders, and third parties should be able to review the WMPs and understand why each initiative was selected based on risk mitigation potential, cost effectiveness, and any other contributing factors, as well as the source of the selection criteria, whether derived from quantitative models or subject matter experts.

The SMJUs are, in general, lagging behind the IOUs in terms of performing risk bowtie analyses and implementing wildfire controls and activities based on the outcomes. Liberty notes that its current method for "enterprise-wide safety risk and wildfire-related risk mitigation" is "qualitative, detailed descriptions of risk analysis" with a plan to begin using a risk-based decision model including the "introduction of bow-tie analysis of drivers-events-consequences (Liberty CalPeco 2020 Revised WMP, p. 108)." Neither Bear Valley Electric Service (BVES) nor Pacific Power appear to perform a risk bowtie analysis, and do not include any clear plans to do so in the future. BVES does, however, provide a thorough summary of their final RSE values and how these values compare across WMP mitigation activities. Pacific Power does not determine RSE values for any of its WMP activities. In general, we acknowledge that the SMJUs did not have RAMP/S-MAP filing requirements and that their WMP requirements are somewhat less rigorous than those for the IOUs. However, as the application of risk bowtie analyses, wildfire risk modeling tools, and RSE valuation methodologies mature the SMJUs should be required to incorporate these tools into their WMPs to inform mitigation activities and prioritization. The GPI strongly recommends that the SMJUs move towards performing and applying risk bowtie analyses and quantitative MAVF and RSE methodologies to inform their WMP activities and associated expenditures and prioritizations.

Outcome Metrics Versus Program Metrics

SCE expressed an aversion to using outcome metrics to determine WMP progress, stating:

> SCE established activity and metric goals to evaluate compliance and the efficacy of its WMP. As SCE has stated in previous filings and submittals, tracking Program Targets for approved WMPs are the best means of determining progress, and these are the only metrics that can help assess WMP compliance in the near-term. Progress and Outcome metrics, on the other hand, should help inform the effectiveness of wildfire mitigation activities and identify improvements and changes necessary, but should not be used to measure progress per approved plans. Prudent grid operations, maintenance, and upgrades will not eliminate risk entirely; but over time and cumulatively, will result in an overall reduction of Progress and Outcome Metrics, such as fire ignition events associated with SCE's electrical infrastructure (SCE 2020 revised WMP, p. 8).

The overarching objective of the WMP is to reduce wildfire risk. It follows that an IOU's progress ultimately should also be based on their ability to reduce wildfire risk. The success of any one programmatic element or wildfire mitigation activity, and the WMP as a whole, is only as good as its ability to reduce wildfire risk and mitigate the effects of wildfires that do occur. Focusing solely on programmatic metrics will incentivize the completion of a proposed WMP, but may not result in a plan that is truly the most effective and/or cost-effective approach to mitigating wildfire. The GPI therefore continues to advocate for using outcome metrics alongside program metrics to assess the success of an IOU in achieving their WMP objectives. While we acknowledge that stochastic variables like weather and climatic factors contribute significantly to wildfire risk and outcomes, the controls that WMPs effectuate should function to reduce the occurrence of ignition events and near misses, particularly on a normalized scale (e.g. events per RFW per line-mile), regardless of the frequency of high-risk fire conditions. IOUs should be held accountable for devising effective WMPs based on comprehensive wildfire risk assessments that are in fact capable of reducing near miss and ignition events, and should not be rewarded for producing and implementing plans that fail in this critical regard.

We recognize that WMP initiatives such as grid hardening and EVM are ongoing processes that will take time to achieve saturation across the HFTDs. Providing near miss and ignition data on only those lines that are hardened and/or updated based on new EVM practices and other wildfire mitigation activities, and comparing those data to historical data and as-yet untreated lines could provide a more focused assessment of WMP success in addition to system-wide and HFTD averages. These data may also facilitate LSEs' plans to use the outcome data from pilot programs and new WMP activities to assess their efficacy. While we acknowledge that many WMPs include statements that suggest LSEs intend to learn from the results of each initiative, this is an important aspect of the WMP process that bears repeating. It is imperative that the WMP outcome metrics feedback into the development of future WMPs and result in an iterative process between Outcome metrics driving and informing program design and metrics.

Vegetation Management

Vegetation contact is one of the leading fire-ignition drivers (Fig. 1), with a likelihood of ignition potential on par with, or above average compared to other contact ignition drivers (Fig. 2). The IOUs are leading the charge in heightening vegetation management (VM) practices that go beyond the minimum CPUC requirements in HFTDs. Our comments focus on distribution system VM, since distribution lines are more frequently associated with vegetation contact and resultant ignition events, likely due in part to their frequent passing through forested areas, and the fact that transmission lines are more likely to run through corridors that are not in heavily forested areas. The expense of each vegetation management treatment is highly location-dependent, and the associated RSEs display a wide range, with many of the activities lacking any risk reduction or RSE metric. Additional quantitative data is needed to assess the efficacy of each IOU's enhanced vegetation management (EVM) approach. These data will also support the transfer of appropriate and cost-effective heightened vegetation management approaches to SMJUs located in HFTD regions with vegetation that is similar to that of the nearby IOU.

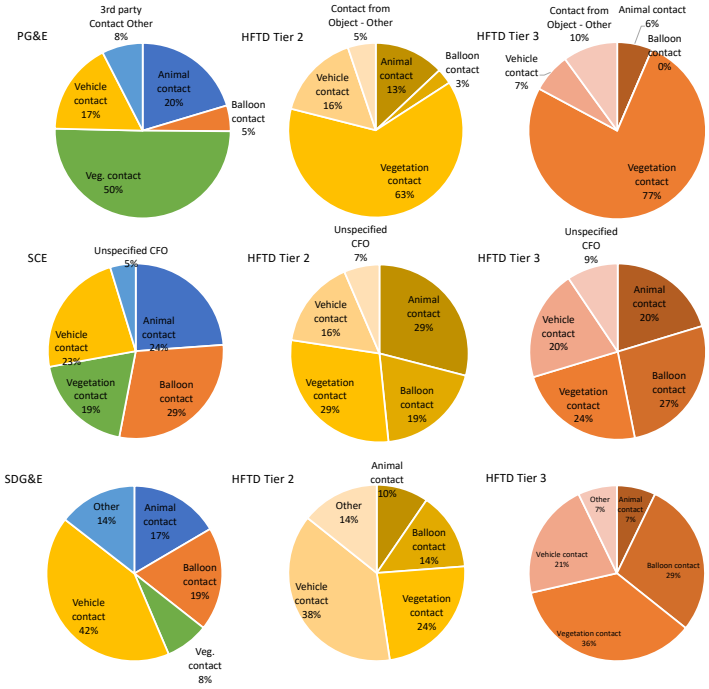

Figure 1 Distribution system-wide, HFTD Tier 2 and HFTD Tier 3 ignition drivers based on the 5-year average for number of incidents per year. Data from P&GE, SCE, SDG&E 2020 Revised WMP, Table 11.

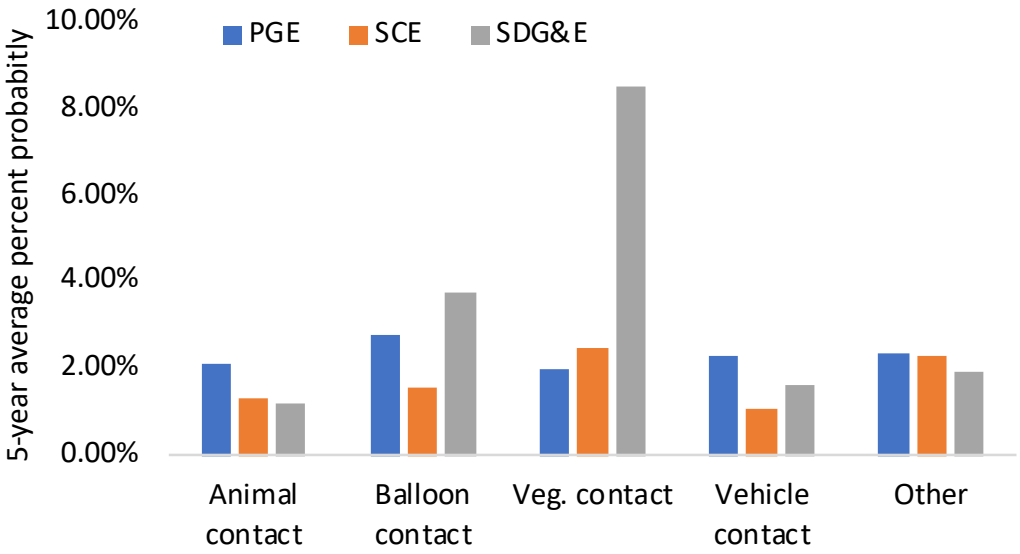

Figure 2. Distribution system 5-year average percent probability for each ignition driver. Data from PG&E, SCE, SDG&E 2020 Revised WMP, Table 11.

SCE describes an approach that removes strike potential trees and fast-growing species "as applicable," but continues to use the CPUC required clearances for trimming (i.e. a minimum of 4 feet radial clearance from distribution lines). Their novel approach, termed Integrated Vegetation Management (IVM), includes establishing low growing, vegetation along ROWs or easements in order to deter the growth of tall trees. GPI is interested in the potential sustainability aspect of SCE's IMV approach and its ability to reduce recurring costs associated with annual tree trimming and removal. Notably, SCE predicts their VM will result in a substantial drop in vegetation contact events (Fig. 3). The anticipated small decrease in probability of ignition from 2.1 to 1.7 percent (Fig. 3) may be linked to other WMP activities (e.g. covered conductor installations). The resultant ignition forecast predicts an approximate 80 percent decrease in vegetation driven ignition events (Fig. 3).

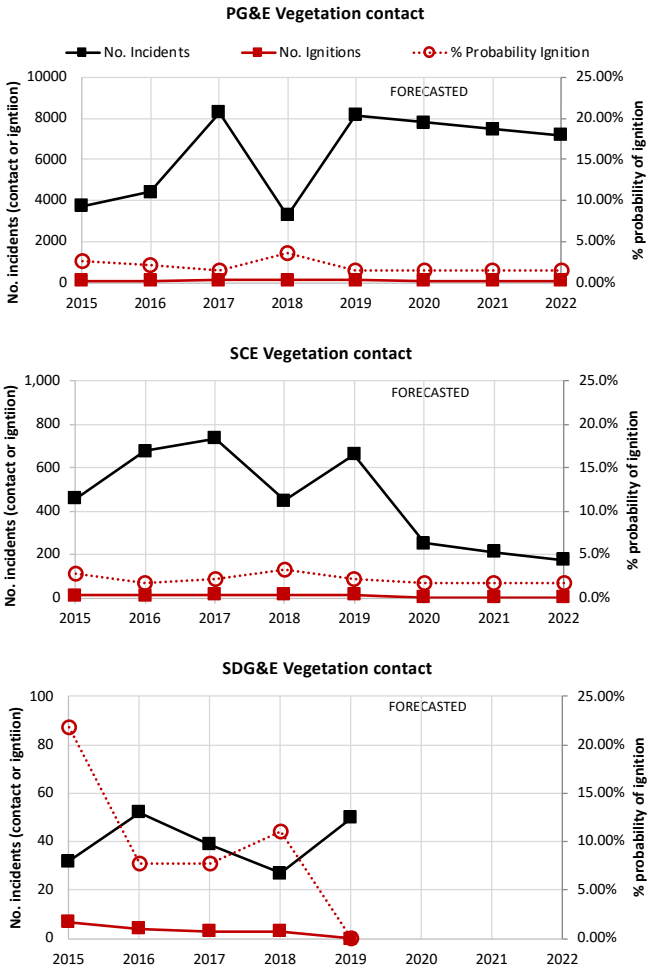

Figure 3. Distribution system-wide vegetation contact incidents, probabilities, and ignitions per year including IOU actual and forecasted incidents. Data are from PG&E, SCE, SDG&E 2020 Revised WMP, Table 11 and 31. SDG&E did not provide forecasted data in Table 31.

GPI requests that SCE provide additional information in subsequent WMPs regarding the chemicals and other methodologies they will employ to achieve their low-growth buffer zones, including the anticipated maintenance schedule. We also request that SCE provide additional data in future MWPs regarding the efficacy of the IVM program to limit hazard tree growth and wildfire potential associated with ignition events. The anticipated cost of the IVM program is not apparent in Table 25, "Vegetation Management and Inspections (Fig. 4)." SCE should clarify both the anticipated near-term and long-term (10-year) costs of their IVM approach.

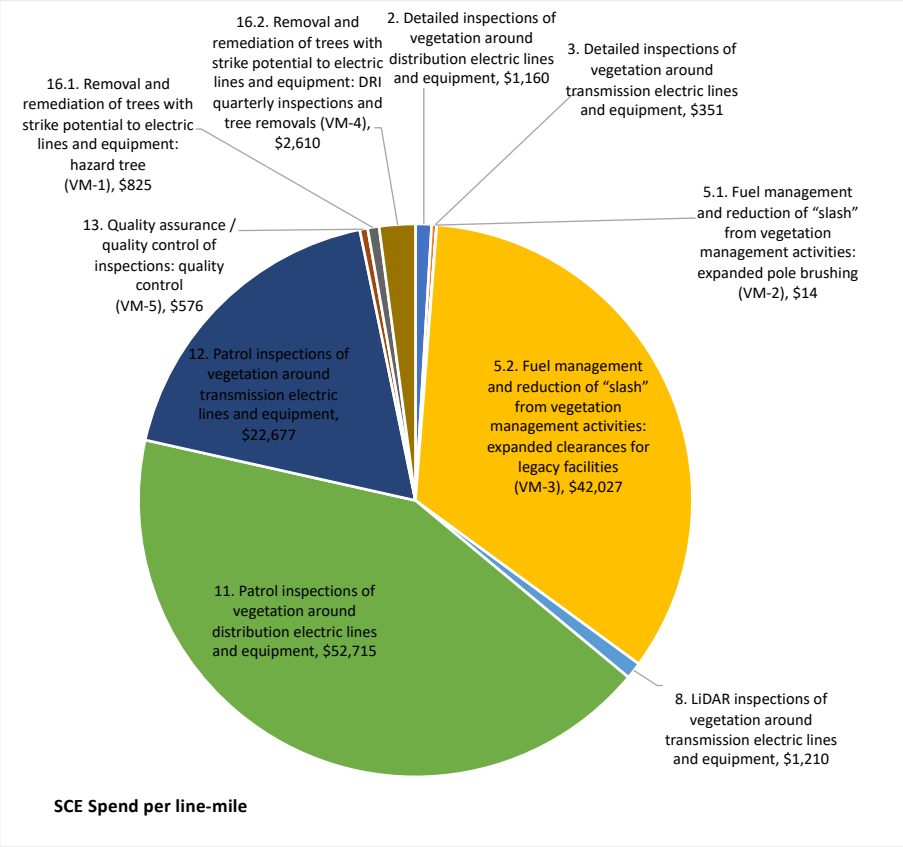

Figure 4 SCE "Vegetation management and inspection initiatives" from their 2020 Revised WMP (Table 25). **Activities** without "spend per treated line-mile" data are not included.

PG&E includes an Enhanced Vegetation Management program that completely clears overhanging vegetation to the sky, within the 4-fot radius of conductors and achieves a radial clearance of 12 feet or more. They are also evaluating and removing trees from further away that have identified strike potential. Despite conducting EVM on approximately 4,300 line-miles from 2019 – 2020, they predict a relatively small proportional decrease (~ 12%) in system-wide vegetation contact through 2022 (Fig. 3). It is unclear from the data if this is due to a "dilution" effect related to vegetation contact events in non-HFTD zones, or because of the EMV methodology itself. The ignition probability is anticipated to remain constant from 2019 – 2022. PG&E predicts that ignition events will drop 12 percent by 2022 (Fig. 3). PG&E'ss normalized EVM costs may be the highest of the IOUs at $ 257,000 per line-mile (Fig. 4). PG&E should show

the efficacy of their EMV methodology based on treatment specific and HFTD-localized vegetation contact and ignition data.

SDG&E proposes the most aggressive expansion of radial clearances out to 25 feet. These enhanced clearances are 6.25 times the CPUC standard. The extent to which they will implement the 25-foot clearance is based on new Vegetation Risk Index (VRI) criteria that takes into account numerous factors such as tree species and vegetation density. GPI acknowledges that each IOU territory covers a variety of ecosystems that host different vegetation and tree types. Further, it was noted in the 2020 WMP workshops that palms fronds pose an additional contact risk since they can travel far distances in high winds. However, GPI recommends that SDG&E provide addition data justifying these large clearances, as well as an estimate on the number of line-miles to which they will apply the enhanced vegetation management. SDG&E should also clarify the multiplier (e.g. $1,000s) for their VM Table 25 budget. Assuming the budget is in the range of $1,000s per line-mile, SDG&E's "Enhanced inspections, patrols and trimming" are approximately $4,100 per line-mile. This is only 1.6 percent of the cost of PG&E's per line-mile EVM program.

SDG&E does not forecast vegetation contact, ignition probability, and associated ignition through 2022 (SDG&E 2020 Revised WMP, Table 31, Fig. 3). The lack of forecasted vegetation contact and ignition data calls into question whether the 25-foot radial clearance is adequately optimized and vetted for its ability to reduce vegetation-associated ignition events while balancing the vegetation impacts on customer and federal lands. SDG&E's historical distribution data show a decrease in the likelihood of ignition. However, we suspect that the decrease in ignition probability is associated with a range of WMP activities, including installation of covered conductors and VM activities such as fuel reduction. SDG&E should provide quantitative evidence that shows the 25-foot radial clearances are warranted, and provide the proportion of VM trimming in HFTDs that are treated subject to this aggressive new standard.

Table 1 Risk Reduction (RR) and RSE values for VM activities from WMP Table 25

		2020-2022 Plan totals	
IOU	**Activity**	**RR**	**RSE**
PGE	5. Fuel management and reduction of "slash" from vegetation management activities and 15. Remediation of at-risk species - Enhanced Vegetation Management	201.83	0.15
SCE	5.1. Fuel management and reduction of "slash" from vegetation management activities: expanded pole brushing (VM-2)	0.7	58.5
	16.1. Removal and remediation of trees with strike potential to electric lines and equipment: hazard tree (VM-1)	4.4	24.8
	16.2. Removal and remediation of trees with strike potential to electric lines and equipment: DRI quarterly inspections and tree removals (VM-4)	3.4	30.4
SDG&E	Tree Trimming	50%	122.5
	Fuels Management Program	0.4%	5.2
	Enhanced Inspections Patrols and Trimming	5.0%	14.41

Revised VM methodologies likely drive the anticipated decrease in vegetation contact events (Fig. 3). However, system-wide ignition probability, and ignition incident reporting requirements in WMP Tables 11 and 31 do not give an accurate indication of the efficacy of EVM strategies in HFTDs. "Before and after" data tables on those regions treated with updated VM approaches within HFTD would provide valuable insight into their efficacy and cost-effectiveness. All LSEs that test and/or adopt alternate vegetation management strategies should be required to provide VM treatment-specific, wildfire risk-mitigation data. These data may also provide insight into risk reduction and RSE scores.

The IOUs RR and RSE values are only determined for a small subset of their VM activities and span a wide range (Table 1, from PG&E, SCE and SDG&E 2020 Revised WMP, Table 25). It is nearly impossible to evaluate and compare the IOU's risk reduction (RR) and Risk Spend Efficiency (i.e. cost-effectiveness) values for each type of VM methodology. Large differences between RR and RSE values for similar activities (e.g. Tree Trimming) may be an indication of variations in vegetation and VM approach, among other factors. RR values also appear to have different calculation methodologies based on the number format (e.g. percentage). To our knowledge the underlying calculations and considerations are not provided in the supplemental materials. While we understand that the methodologies are under development in the RAMP/S-MAP proceedings, the WMPs should function as a stand-alone filing that provides transparency into the assumptions and underlying factors resulting in the final RR and RSE valuation. That is, the underlying RR and RSE assumptions and assessments are opaque, and do not reveal how well the IOUs have optimized and vetted their approaches to updated VM practices. Future WMPs should include underlying RR and RSE calculations (i.e. applied RAMP/S-MAP methods), and a description of the data and/or assumptions used to determine these values.

The SMJUs plans generally lag behind the IOUs, and likely rely on method development and maturation in the IOU service territories prior to adoption. Our recommendations for additional transparency into WMP VM practices will facilitate method development, optimization, and state-wide adoption. We also recommend that SMJUs accelerate their

adoption of digitized VM tracking systems to support data-driven insight on the efficacy of adopted VM activities.

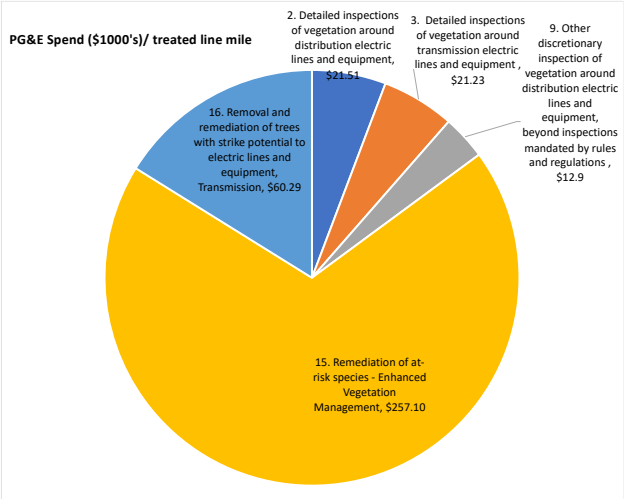

Figure 5 PG&E "Vegetation management and inspection initiatives" from their 2020 Revised WMP (Table 25). Activities without "**spend** per treated line-mile" data are not included.

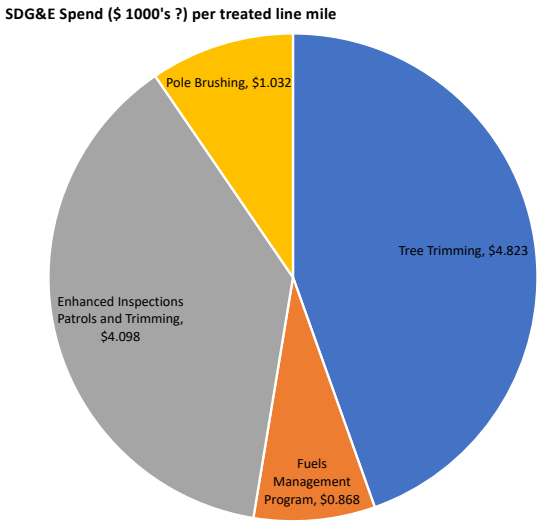

Figure 6 SDG&E "Vegetation management and inspection initiatives" from their 2020 Revised WMP (Table 25).

Vegetation Management Residues

The vegetation management activities being carried out by the IOUs create large quantities of biomass residues, which are mostly felled trees and limbs. Some of the residues may be the property of the IOUs, but most are the property of landowners through whose land the transmission and distribution lines run through subject to right-of-way agreements with the utility companies. The minimal responsibility of the IOUs with respect vegetation management is to remove vegetation impinging on or endangering the powerlines. There are no guidelines about how to handle or process the vegetation that is removed, and there have been multiple reports that landowners have complained about residues simply being left haphazardly on the ground as they are cut by the vegetation-management crews.

A huge quantity of biomass residues are being generated due to tree removals and trimming undertaken for business-as-usual and WMP enhanced vegetation management (EVM) actives. PG&E reported removing over 48,000 trees in 2019 alone (PGE 2020 Revised WMP, Executive Summary - 3). Additional biomass residues were generated from the nearly 2,500 line-miles of EVM work that PG&E completed in 2019, with another 1,800 miles planned for 2020 (PG&E 2020 revised WMP, p. 5-7). PG&Es vegetation database tracks around 120 million trees with the potential to encroach or fall onto overhead lines. Both the ongoing identification of risk trees, as well trimming and removing trees in the existing database will equate to a substantial and ongoing supply of biomass residues from WMP and business-as-usual vegetation management. While PG&E is the largest IOU, all IOUs and SMJUs are contributing to the vast quantities of biomass residues produced via VM activities. By January 2020 SDG&E had performed EVM trimming on 4,800 trees and removed another 3,700 trees (SDG&E 2020 revised WMP, p. 5). On average they prune 175,000 trees and remove around 8,500 trees each year (SDG&E 2020 revised WMP, p. 117). SDG&E further tracks 460,000 trees in their tree database (SDG&E 2020 revised WMP, p. 127). SCE's VM program identified 16,078 trees for removal and removed 5,917 of those trees in 2019 (SCE 2020 revised WMP, p. 157). Over 10,000 trees currently require removal and do not include additional

removals anticipated from planned 2020 tree inspections. Their VM program is slated to assess an additional 75,000 trees in 2020 (SCE 2020 revised WMP, p. 157).

Despite the apparent large quantities of biomass residues produced on an annual basis, the WMPs contain few-to-no plans for value-added residue end-uses, such as biomass generation, particle board manufacturing, biochar production, and other applications. Existing initiatives in LSEs' 2020 WMP plans are relatively vague in terms of how each LSE will address vegetation residues from trimming, tree removal and fuel reduction activities. PG&E only references plans to discuss with the USFS regarding fuel reduction initiatives and residue disposal approaches such as timber sale, lop and scatter, or chipping (PGE 2020 revised WMP, p. 5-255). They provide no plan for managing biomass residues from the aforementioned trimming and tree removal VM activities. In their section on tree trimming VM, SDG&E and SCE state that they chip and remove the debris off-site (SDG&E 2020 revised WMP, p. 117, SCE 2020 revised WMP, p. 153). SCE is the only LSE that clearly indicates routing some of its VM residues to a biomass plant. Liberty includes plans to chip or lop and remove or redistribute the residues depending on location type. They also noted:

> … the need to evaluate the current fuel management approach and develop a new methodology for fuels treatment that aligns more closely with joint goals of agency partners and the local community to ensure that vegetation management fuel load is treated in a manner that reduces both fire ignition risk and the potential for increased fire intensity (Liberty 2020 revised 2020 WMP, p. 81).

BVES does not include any VM residue or fuel management and reduction plans, and only goes so far as to state that "Fuel management and reduction of "slash" from vegetation management activities have been incorporated into the utility's ongoing and newly proposed vegetation management initiatives as describes in Table 25 (BVES 2020 revised WMP, pg. 168)." However, there are no additional details on how biomass residues are managed. PacifiCorp also outlines vague plans regarding the "…execution of fuel management activities that reduce the availability of fuel in proximity to potential sources of ignition … ," but do not provide a clear reference regarding the endpoint of the residues from VM activities. This current situation, even in cases where there is some

care taken to clean up the residues after management activities are completed, represents an enormous lost opportunity for both the IOUs and the landowners through whose lands the powerlines run.

The GPI proposes that the IOUs formulate an initiative to actively promote the complete removal of vegetation management residues from the site after trimming is complete, including segregating any commercially useable material for shipment to sawmills, particle board mills, or similar manufacturing facilities, and chipping the remaining material and shipping it to biomass generating facilities. Many, if not all of California's more than 20 operating biomass facilities would be more than willing to accept such fuel, and to pay market rates for its delivery. Similarly, forest products manufacturers would be willing to pay market rates for raw material suitable for their operations. Such an initiative would not only remove biomass residues that, when left in place, are significant fire hazards in their own rights, it would also promote more harmonious relations between the IOUs and the landowners on whose properties the IOUs hold rights-of-way positions. The IOUs are not in a position to force anyone to participate in having the utility manage the disposition of the residues when performing vegetation management operations, but making the service readily available and promoting it might very well encourage many more landowners than is presently the case to make sure that their residues are directed to beneficial-use applications.

We realize that the IOUs are only responsible for performing vegetation management operations along their powerline rights-of-way. However, it is clear that forestlands in the near-vicinity of the rights-of-way can play a major role in fire propagation, both for fires that are initiated by the powerlines or other electrical equipment, and for other fires that may occur as the result of non-IOU ignition factors. While the IOUs do not have specific rights or mandates to perform vegetation management activities away from their rights-of-way, they do have a strong interest in encouraging the nearby landowners to perform such activities in cases where the surrounding lands are in overgrown, high-fire-risk condition, which is a common situation in many areas of the state. Thus, we are proposing that the IOUs, in formulating vegetation-management-residue initiatives for their own operations,

include robust outreach activities aimed at nearby landowners to encourage them to perform their own vegetation management operations on their properties, and to offer to coordinate such activities with the vegetation management operations that the utilities are performing, including coordinating the management and disposition to beneficial uses of the residues resulting from the vegetation management operations that are undertaken by landowners independent of the IOUs' operations. Such programs would not only contribute to reducing overall wildfire risks, they would also promote better relations between utilities and the landowners of the properties that host the utilities' powerlines.

Microgrids

Microgrid installations are predominantly assessed within the microgrid proceeding (R.19-09-009), yet they present an important tool for mitigating customer impacts during PSPS. The WMP template calls for a description of planned microgrid installations relevant to HFTDs and wildfire mitigation activities. SDG&E describes three microgrid projects that are slated to come online in 2020 and will support low-income communities located in or adjacent to HFTDs. They also reference additional microgrid projects planned for online dates in 2021 and 2022. PG&E incudes discussion on multi-use, multi-customer microgrid plans in Arcata/Eureka, and describe temporary microgrid installations during PSPS events that were piloted in 2019. The targeted locations for installations that enable additional temporary microgrids are, however, unspecified, suggesting they may require additional time for implementation beyond the 2020 target date. SCE only references potential microgrid pilots and installations depending on RFP outcomes, and provides no information on the potential microgrid locations or how they will reduce the impact of PSPS. Liberty incudes one developing microgrid project in Sagehen. BVES and Pacific do not reference any activities regarding microgrids.

While we agree that policy issues relating to microgrid installations should be addressed in the Microgrid OIR, this does not preclude assessing and utilizing microgrids as a customer impact mitigation approach in the WMP. Since the WMP is the filing that determines wildfire and customer impact mitigation activities, it is reasonable for this process to either (*i*) funnel granular PSPS and HFTD data to the Microgrid proceeding in

order to facilitate microgrid site selection in optimal locations that reduce wildfire risk and/or customer impacts, or (*ii*) identify potential optimal microgrid locations in the WMP based on HFTDs and reoccurring PSPS locations. The GPI recommends that a clear connection with more established informational exchange pathways should be established between the Microgrid proceeding and the WMP in order to facilitate the installation of microgrids that support wildfire and PSPS-mitigation objectives.

Thresholds for Asset Replacement Should be Transparent

WMP filing instructions request the wires utilities who are filing to: "Discuss proactive replacement programs versus run-to-failure models for each group…" The IOUs all employ a run-to-condition standard for asset replacement. The threshold conditions underlying asset replacement are not provided in the IOU WMPs. Liberty utilizes a run-to-failure replacement strategy (Liberty 2020 Revised WMP, p. 54). Pilot Power and BVES do not provide information regarding whether their asset replacement schedule is a run-to-condition or run-to-failure approach. GPI recommends that all WMPs disclose the thresholds for asset replacement. The increased transparency will provide additional insight on ignition and near misses linked to asset failure, and can inform updates to SMJU asset replacement that are better aligned with run-to-condition replacement schedules.

Assessing Utility-Customer Communication Channels and Customer Needs

The WMPs should include comprehensive plans to obtain and assess customer outreach efforts and analyze feedback information regarding PSPS and customer-utility communications. The plans should include surveys or other diagnostic data collection tools that provide the Utilities with a better understanding of who their correspondences and PSPS customer impact mitigation activities reach. These data should inform the Utilities' approach to "Community Outreach, Public Awareness and Communication Efforts," and "Customer Support in Emergencies," and should function in an iterative fashion that continually updates and improves Utility-customer communications and outreach programs based on lessons learned. More thorough descriptions and examples of

the outreach and communication program assessments are warranted in future WMP filings.

LSE Specific Comments on 2020 Wildfire Mitigation plans

Pacific Gas & Electric (PG&E)

PG&E provides the most comprehensive WMP. However, their WMP, like other WMPs of the wires utilities, should include a more thorough description on how the bow tie risk analysis, risk reduction and RSE values, and other analyses, data and resource constraints led to activity prioritization, resource allocation and program metrics. This is discussed in more detail below.

We agree with PG&E that trends in the 5-year data may be more valuable than determining the 5-year average for data types including, but not limited to, PSPS hours, near misses, and ignition events (Fig. 3). However, we see no reason to eliminate the 5-year average reporting requirement. We also agree with PG&E that including like-for-like comparisons by normalizing data to RFW circuit mile day per year within HFTDs, versus system-wide, may be a beneficial parameter for assessing changes in wildfire risk. Again, we see no reason to eliminate the existing determination of system-wide normalized annual data, in part due to the fact that climate change is likely to result in changes to wildfire risks, including the boundaries of HFTDs, over time.

Southern California Edison (SCE)

SCE expressed an aversion to using Outcome metrics to assess the success of accepted WMPs, stating that: "…tracking Program Targets for approved WMPs are the best means of determining progress, and these are the only metrics that can help assess WMP compliance in the near-term (SCE 2020 revised WMP, p. 8)." The GPI believes that Outcome metrics have an important role in determining WMP compliance, given that the primary object of WMP initiatives are to reduce wildfire risk and impacts. If the WMPs are unable to reduce wildfire risks and impacts they are falling short and should be reevaluated. Simply checking-off program metrics that have been completed is

insufficient to ensure that WMP activities are properly identified and adequately scoped. Additional discussion is provided below.

SCE's tables (e.g. SCE 2020 Revised WMP, Table 22) on initiative activity implementation data suggest that existing "Traditional Programs" are outside the purview for determining RSE values, since they are "already a compliance program and not a WMP initiative." Other table notes exempt indirect activities from RSE quantification. The GPI disagrees with these determinations and believes that all initiatives that can reduce wildfire risk, either directly or indirectly, existing or new, should include Risk Reduction and RSE values. Preventative and/or tangential controls in the MWP that enable direct wildfire risk mitigation activities still have associated costs and risk mitigation value. These recommendations extend to all Utility WMPs.

San Diego Gas & Electric (SDG&E)

SDG&E does not provide any data in Table 31 "Change in Drivers of Ignition Probability Taking into Account Planned Initiatives, for Each Year of Plan (SDG&E 2020 Revised WMP, p. 81)." The Commission should require SDG&E to complete Table 31 with quantitative data prior to accepting their WMP filing.

SDG&E frequently references using subject matter expertise (SME) to make decisions regarding WMP activity implementation, analyses, and capital allocation. While the GPI agrees that SME is valuable to developing the WMPs, overreliance on SME to make crucial decisions regarding WMP cost allocations, activity implementation (e.g. PSPS), and analyses could lead to inconsistencies, errors, shortcomings, or other issues that result in a failure to mitigate wildfire risk. SME-based decisions are also less transparent than established protocols that support ongoing iterative refinements as well as comparison between LSE standards/thresholds and methodologies. GPI encourages the Utilities to integrate SME-based recommendations into established protocols, risk assessment frameworks (i.e. bowtie analysis), quantitative models and other WMP tools, methods, and protocols to the maximum extent possible. These tools, methods and protocols should be vetted and iteratively updated based on data-driven assessments as well as SME to

incorporate lessons learned on an annual or sub-annual basis. These "living-document" type tools, methods, and protocols will support more consistent initiative implementation (e.g. PSPS) and wildfire risk mitigation assessment that both build-on and preserve the value of SME inputs over time.

SMJUs

Liberty CalPeco made some strides towards reducing wildfire risk and updating their operational and prediction systems in 2019, but largely adopt a business-as-usual approach in their WMP. Their approach to wildfire risk assessment and mitigation is less mature than that of the IOUs, including performing risk bowtie analyses, integrating data-driven probabilistic models, and establishing asset tracking and other digitized tools. Notably, Liberty grid condition findings within Table 1 and 2 indicate values on par with PG&E. For example, in 2019 Liberty reports Level 2 and 3 findings within HFTD at 0.21 and 3.8 per mile, compared to 0.17 and 6.7 for PGE. Liberty also reports near misses at 0.342 per RFW circuit mile day per year in 2019, compared to 0.128 for PG&E. These data indicate that Liberty, while covering a much smaller territory, experiences grid conditions that increase wildfire risk at a frequency that is similar to that of PG&E.

Liberty and Pacific Power also lack forecasted mitigation values in their WMP. We understand that quantitatively determining and forecasting near miss and ignition probability across smaller territories such as those of the SMJUs is difficult due to the relatively small data sets. It still stands that the overall per-circuit-mile probability of wildfires in SMJUs is probably not less, on a per circuit-mile basis, than that of the IOUs, which have a more statistically robust dataset over larger areas. This is important to keep in mind while evaluating the SMJUs' WMPs. Zero ignition events or wildfires within a small area does not indicate zero probability of ignition and wildfire. Consider PG&E incident and ignition data, where ignition probabilities for contacts from objects and most equipment failures are less than 5 percent, and in some cases less than 1 percent (PG&E 2020 Revised WMP, Table 11). A Utility would have to registering at least around 100 incidents per year across its territory to capture and quantify annual ignition probabilities of this magnitude.

Extrapolating the assessment one step further, it follows that annual wildfire risk is presumably no more likely in any one region within an IOU's HFTD territory (i.e. on the scale of an SMJU) within an SMJU territory. Put another way, each ignition driver event in an SMJU likely has the same probably if leading to an ignition as it would in an IOU territory. Filling in the incident/ignition/wildfire data gap for a small region such as SMJU territories would require data aggregation over long timeframes or extrapolation from nearby, larger utilities. We suspect that aggregating data over long timeframes would encounter historic data availability issues (e.g. past 20 years), while waiting for data to accumulate over time (e.g. future 20 years) is undoubtedly unacceptable. It may be appropriate to assume that the probably of ignition within a smaller SMJU territory is similar to that of an adjacent IOU for each identified driver (e.g. vegetation contact) given similar line construction and assets. We do, however, acknowledge that there are many variables between utility maintenance and operations that make any extrapolation little more than a rough estimate. GPI therefore strongly recommends that the Commission review the SMJU WMPs with the assumption that normalized ignition-driver frequency, ignition probability, and ignition frequency are roughly the same as those documented in adjacent IOUs.

We understand that Liberty and the SMJUs are not held to the same rigorous filing standards as the IOUs. However, the potential risks and impacts of wildfires in their territories are roughly the same. GPI believes it is imperative that the SMJUs catchup in terms of adopting the tools the IOUs have pioneered and matured. The SMJUs should accelerate numerous wildfire mitigation activities, including, but not limited to: (*i*) Develop a Risk-based decision-making framework, including RSE values (Liberty and Pacific Power) and thorough risk bowtie analyses, and implement the findings accordingly; (*ii*) Move away from SME-based decision making and establish more comprehensive, "living-document" tools, methods, and protocols; (*iii*) Adopt digitized versus paper forms and advanced system tracking; (*iv*) Assess run-to-failure asset replacement schedules and its impact on wildfire risk; (*v*) Vegetation management compliance and consideration for enhanced vegetation management; (*vi*) Integration of mature wildfire modeling tools; (*vii*) Develop a more comprehensive customer

communication and outreach program and concrete plans for providing support (e.g. backup generation, community support locations) for affected customers; and (*viii*) Assess the rate of system hardening and increased system resiliency upgrades and its impact on wildfire risk. These activities can also take the form of increasing collaboration with the IOUs to leverage their existing and more mature protocols, methodologies, and modeling tools (e.g. in-house weather and wildfire modeling and super-computing resources). The quantitative and procedural outcomes of each collaboration should, however, be clearly articulated in the WMPs, rather than simply stating that a collaboration took place.

Conclusion

GPI's overarching concern is the lack of cohesion between comprehensive wildfire mitigation risk assessments (e.g. bowtie analyses), and methodology testing, vetting, selection and validation via risk-mitigation quantification and cost-effectiveness valuation. The logical connections and role of each of these components in an iterative WMP process are relatively straight forward: assess risk, select and design mitigation controls, measure and validate their efficacy, adjust best practices accordingly. However, the IOU and SMJU WMPs are relatively opaque and vague in terms of the inputs and outputs of each of the plan development components, and how the outputs led to the proposed wildfire mitigation plans.

For example, the LSEs do not provide a clear explanation of their wildfire risk bowtie analysis outcomes, how or to what extent the bowtie analyses, RR and RSE values guided the selection and appropriation of funds to various mitigation controls, how they determined the efficacy of new VM approaches, or even what inputs and assumptions led to the resultant RR and RSE values. It is also not apparent how or to what extent LSEs used the RR and RSE values to inform new best-practices. While we acknowledge that wildfire risk reduction is a complex, multi-variate problem, this does not preclude cohesive and transparent risk management plan development. The LSE WMP maturity self-assessment plans suggest plans are rapidly maturing based on program benchmarking, we believe the WMPs are lacking a level of cohesiveness required for plan maturation. The next WMP cycle should elucidate the connections between the wildfire risk bowtie

assessment, quantitative diagnostic tools (e.g. RR, RSEs, probabilistic models, treatment specific data), and resource constraints among other inputs as they inform defined activity prioritizations and associated cost allocations.

We recommend that the Commission adopt the positions that we have taken in these comments.

Dated April 7, 2020
Respectfully Submitted,

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