

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

Wildfire Safety Division
California Public Utility Commission

**COMMENTS OF THE GREEN POWER INSTITUTE
ON DRAFT RESOLUTION WSD-021**

August 30, 2021

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Pursuant to instructions in the August 9, 2021, cover letter accompanying WSD-21 – 2021 Wildfire Mitigation Plan Update of Pacific Gas & Electric Company, 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 Draft Resolution WSD-021*.

California's current, record setting wildfires are a stark reminder of the implications of risk and ignition events and the imperative for advancing utility wildfire risk mitigation. As the WSD resolutions recognize, wildfire risk mitigation is and will remain an ongoing process that requires stepwise approval that is accompanied by constant improvement. GPI generally supports Resolution WSD-021 approving PG&E's 2021 WMP update with key areas and issues for improvement going forward. We further look forward to descriptions of substantive updates in PG&E's forthcoming Change Orders and 2022 WMP annual filing, including plans to underground 10,000 miles of overhead lines in HFTD and a new system hardening decision making framework.

Risk modeling and transparent model vetting

GPI strongly supports key areas for improvement that address Risk Assessment and Mapping (Section 5.1) including wildfire risk model alignment and vetting. Key areas for improvement, PGE-21-01 and PGE-21-04 are applicable as a subset of the broad directive PGE-21-02 that requires IOUs to align their wildfire risk models. GPI agrees that PGE-21-01 and -04 have merit as independent key areas of improvement. However, tracking progress on these and other wildfire risk mitigation method improvements outside of the mandated risk modeling working group (WG) may present challenges. GPI recommends adding guidance that responses and adjustments regarding PGE-21-01 and -04 should be discussed in the risk model working group and included in WG reports as well as in the November 1, 2021, progress report and the annual 2022 WMP Update filing. GPI also

respectfully requests to be added as a contributor to WSD-021 Action Statement stakeholder input regarding: “The risk models should be subject to verification (MGRA,) (WSD-021 Action Statement)”; consistent with our comments on and the associated revisions to WSD-019 and WSD-020.

GPI also supports PGE-21-05 regarding PG&E’s lack of progress on a granular PSPS risk model. We further recommend establishing a second joint IOU working group to develop and align PSPS risk modeling methods parallel to the wildfire risk modeling working group.

While weather patterns, system design and therefore PSPS thresholds may vary between utilities, the general parameters that determine utility PSPS risk (e.g. climate, weather, granular fire risk) are similar. It follows that granular PSPS risk mapping methodologies can and should generally align between the three IOUs.

The progression from three disparate IOU-designed models towards model alignment is a common occurrence for IOU modeling capabilities across numerous CPUC proceedings. This trend now includes the WMP with the stipulation that the IOUs develop a more unified granular wildfire risk modeling and model vetting method via a working group. This process typically takes years of independent development followed by similar timeframes for model alignment, and stakeholder/third-party vetting. GPI recommends progressing directly to the joint development of granular PSPS models by all three IOUs via a working group, versus having PG&E independently invest substantial modeling resources on developing a PSPS method that will inevitably benefit from co-development and/or alignment with SCE and SDG&E. Notably, WSD-021 recognizes that PG&E is behind the other IOUs in terms of the risk assessment and mapping maturity model ranking. It follows that PG&E’s timeline for developing granular PSPS risk models characterized by advanced maturity model rankings is and may continue to be similarly stunted. Skipping the independent development phase may accelerate PGE’s path to implementing a working, granular PSPS model that can benefit ratepayers by effectively guiding mitigation initiatives that target and reduce PSPS occurrences.

GPI appreciates and supports the discussion of the third-party evaluation in the WSD-021 Action Statement, especially regarding the use of ignition versus outage data to train ignition risk models:

One particular area of improvement listed by the third-party evaluator was to analyze using outage data instead of ignition data in order to train its models. The third-party points out “the smaller ignition dataset raises concern about the statistical power of the models trained on them. If there are too few ignitions to deliver a good model fit, it will fail to accurately predict on out of sample data (new locations, future years, etc.).”

The third-party report, demonstrates that areas with high ignition rates do not necessarily correlate to areas of high outage rates. However, due to the high volume of data points needed to reduce bias when implementing machine learning, SCE currently uses outage data in order to garner more accurate output from its model for ignition risk. PG&E’s use of only ignition data to train its model weighs more heavily on the parameters in which an event would lead to an ignition as opposed to the cause of the event.

This recommendation aligns with our concerns in opening comments on PG&E’s 2021 WMP Update regarding the use of ignition versus outage input data for their wildfire risk model and the potential statistical power limitations of using a smaller dataset. We also agree with the assessment that training a model on outage data versus ignition data has different forecasting implications, where ignition data inherently include more wildfire risk drivers/parameters (e.g. fuel type and presence, fuel moisture, temperature) that overlap with inputs to the consequence model. Using outage data, or risk events, as the risk model input will not only increase the statistical power of the model, it will also decouple the ignition probability model from environmental conditions to instead rely on consequence modeling and associated environmental data inputs to drive this aspect of the model output. This may be an important model capability that better allows for forward looking climate impacts on granular wildfire risk mapping. That is, by separately modeling ignition probability based first on outage events (e.g. wire down, contact from vegetation etc.), these models can then layer in changing environmental conditions based on long-term climate modeling to anticipate regional shifts in or expansions of wildfire risk. Wildfire models with more forward-looking capabilities based on *anticipated* changes in environmental conditions and therefore risk, can inform *preemptive* expansion of wildfire risk mitigation initiatives in regions that may not yet register as high wildfire risk.

GPI fully supports the related key areas for improvement in PGE-21-04 and -06 to “Address discrepancies between its input data sets and those of peer utilities” and “Provide an update on progress made on each of the third-party’s recommendations,” respectively. These key areas for improvement will likely overlap with wildfire risk model alignment in the mandated working group. GPI supports requiring early updates from PGE on these issues and further encourages the forthcoming working group to address these issues in additional detail and scrutiny. GPI also recommends exploring the option of a formal and ongoing third-party wildfire risk model evaluation cycle that will guide ongoing model refinement based on updated model methodologies and wildfire science for years to come.

Egress, ingress models and consideration (Section 5.1 risk modeling and assessment)

Based on our review of the 2021 WMP Updates and direct ingress/egress line of questioning at the IOU 2021 WMP Update workshop, all IOUs are now using a post-risk modeling approach to considering egress and ingress routes in their wildfire mitigation planning. PG&E appeared to be the only IOU that attempted to directly model ingress/egress in their wildfire risk model in 2020, which they reported failed and was therefore removed in favor of what appeared to be a post risk model consideration more similar to SCE and SDG&E’s approach. Despite indications that all three IOUs are considering ingress and egress routed as post-risk modeling considerations, versus integrated into the risk models, only WSD-021 calls for methodological clarification from PG&E:

ISSUE: PG&E's new model does not include egress as an input (in contrast to its previous wildfire risk model, which did include egress as an input). PG&E instead relies on subject matter expertise to account for egress when determining how to prioritize system hardening projects.

REMEDY: PG&E must provide an update on its development of a methodology to accurately measure and account for egress or explain how it accounts for egress in determining which circuits segments to prioritize for mitigation (WSD-021 Action Statement, p. 47).

GPI agrees that there is a need for additional information on how ingress and egress route considerations are factored into risk modeling and granular risk mitigation integration. However, we strongly recommend that this requirement be extended to all IOUs. That is, none of the three IOUs provide an adequate description of how they factor in egress and ingress routes in their granular risk models or post-modeling risk mitigation implementation decisions.

Section 5.3. Grid Design and System Hardening

PG&E progress to date identified in WSD-021 section 5.3 states:

PG&E analyzes circuit segments across multiple initiatives, including vegetation management and system hardening. In 2021, PG&E plans to avoid overlapping initiatives, stating: “PG&E’s System Hardening and EVM program leads are working together to avoid overlap between the two programs over the next 3 years, where reasonable, based on where System Hardening work is planned.” This further demonstrates that PG&E is working to tailor its initiative selections to the optimal solution for each CPZ, instead of choosing overarching initiatives that may overlap in benefits and therefore not provide the most efficient use of resources. (WSD-021, p. 55-56)

GPI is concerned that this statement makes the assumption that PG&E is capable of assessing the incremental RSE and other quantitative and qualitative benefits (or lack thereof) of overlapping wildfire mitigation initiatives. To our knowledge none of the IOUs are capable of multi-mitigation risk reduction and cost-benefit analysis. Other evidence that PG&E’s efforts to reduce mitigation overlap may not necessarily signify an optimal strategy is the ongoing lack of conclusive field-based risk mitigation data for covered conductor deployment. Without data like these it remains to be seen whether and how overlapping risk mitigation initiatives have additive risk mitigation, or fail to provide incremental risk mitigation. GPI recommends removing this progress statement until PG&E and the utilities are able to evaluate and quantify the risk mitigation value of overlapping initiatives (e.g. VM and grid hardening deployed together).

Section 5.5. Vegetation management and Inspections

PGE-21-018 – PGE-21-018 addresses PG&E low-level VM program maturity goals for the current WMP cycle, noting that “PG&E’s planned end WMP cycle VM maturity is 1, up from 0.7 in 2020.” This is in comparison to SCE and SDG&E which plan to achieve a VM program maturity level of 3 or higher by the end of the WMP cycle. PGE-21-018 then requires PG&E to minimally meet their own objective according to Remedy 1: “Reach a maturity of at least 1 for capabilities 24 “Vegetation grow-in mitigation” and 25 “Vegetation fall-in mitigation” by the end of 2023.” GPI agrees that PG&E’s plans to only achieve a maturity level of 1 by 2023, and since the initiation of the WMP proceeding in 2018, is a weak objective that marks a serious need for PG&E to ramp up their VM program maturation rate and goals. We therefore see no reason to not increase pressure on PG&E to achieve an overall VM program level maturity level of 1.5 by 2023 and a maturity level of 2 for capabilities 24 and 25. This would mark at least some progress towards achieving maturity level 2 and catching up to peer-utilities VM capabilities. Recommended updates are indicated by underlined or strikethrough text:

Reach a maturity of at least 1.2 for capabilities 24 “Vegetation grow-in mitigation” and 25 “Vegetation fall-in mitigation” by the end of 2023 and 1.5 for VM program maturity overall.

PGE-21-20 – PGE-21-20 requires that PG&E provide a description of how they include “fire damage attributes in hazard tree assessments.” GPI supports this key area of improvement. To our recollection, however, other IOUs and SMJUs also fail to clearly describe how they assess and address post-fire damage impacts to hazard trees in their respective territory. GPI recommends clarifying this expectation in the WMP guidelines or elsewhere to ensure all Utilities are addressing this concern.

PGE-21-22 – PGE-21-22 states “While PG&E does not currently prescribe tree work based on specific species, it may choose to do so in the future; in this case, accurate species recordkeeping is essential.” This language deviates from parallel key areas of improvement issued for SCE and SDGE in WSD-020 (i.e. SCE-20-08) and WSD-019 (i.e. SDGE-5). We are concerned that the language in PGE-21-22 is equivocal and only suggests possibly

using tree species data for VM work in the future. GPI recommends removing this equivocal language from PGE-21-22 and instead more closely replicating language from the parallel key areas our improvement in WSD-20 and WSD-19 for consistency and clarity of expectations across the three IOUs:

<p>PG&E-21-22</p>	<p>Incomplete identification of vegetation species and record keeping</p>	<p>In Table PG&E-7.3.5-6 on p. 666, PG&E reports that “Oak” and “Pine” are species that have caused >1 percent of several regions’ outages. <u>However, these are not tree species, but tree genera. PG&E needs to ensure proper identification of trees to the species level.</u> PG&E must ensure proper identification of species so that the “regional species risk values” input to the TAT are updated and accurate. While PG&E does not currently prescribe tree-work based on specific species, it may choose to do so in the future; in this case, a Accurate recordkeeping of the species designation is essential.</p>	<p>PG&E must:</p> <ol style="list-style-type: none"> 1. Use scientific names in its reporting (as opposed to common names). This change will be reflected in the upcoming updates to Energy Safety GIS Reporting Standard. 2. Add genus and species designation input capabilities into its systems which track vegetation (e.g., vegetation inventory system and vegetation-caused outage reports). 3. Identify the genus and species of a tree that has caused an outage or ignition in the Quarterly Data Reports (QDRs) (in these cases, an unknown “sp.” designation is not acceptable). 4. If the tree’s species designation is unknown (i.e., if the inspector knows the tree as “Quercus” but is unsure whether the tree is, for example, Quercus kelloggii, Quercus lobata, or Quercus agrifolia), it must be recorded as such. Instead of simply “Quercus,” use “Quercus sp.” If referencing multiple species within a genus use “spp.” (e.g., Quercus spp.). 5. Teach tree species identification skills in its VM personnel training programs, both in initial and continuing education. 6. Encourage all VM personnel identify trees to species in all VM activities and reporting, where possible.
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GPI is also concerned that tree species data will go unused without guidance or mandates regarding tree species data applications. We therefore recommend requiring all IOUs use species-specific data in EVM and tree hazard studies that are designed to determine tree risk for the purpose of informing and refining VM mitigation methods (i.e. EVM and tree removal). This will guide best practices and reduce the risk of these data becoming an obsolete exercise by eliminating the *optional/potential* use of tree species data going forward. As an alternative or additional measure, GPI recommends ensuring these data inform future VM methods by updating Maturity Model VM capability maturity levels to require VM methods based on tree species.

Section 5.6. Grid Operations and Operating Protocols, Including PSPS

GPI strongly supports key improvement area PGE-21-25 that addresses “Lack of specificity regarding how increased grid hardening will change system operations, change PSPS thresholds, and reduce PSPS events (WSD-021, p. 90).” In our opening comments GPI raised concerns regarding overreliance on weather forecasting and trend mapping to reduce PSPS scope, and the lack of PSPS reductions associated with PG&E’s grid hardening work. PGE-21-25 will provide transparency into if and how PG&E is establishing a link between PSPS reduction and strategic grid hardening, which is also a foundational question required for a PSPS risk model use case that informs system hardening initiatives. This should help direct PSPS mitigation efforts to include long-term grid hardening solutions as a PSPS mitigation “tool”, versus just focusing on operating adaptations to manage weather risk drivers.

GPI recommends adding an Issue/Remedy requirement to WSD-021 that addresses the accepted stakeholder input:

Utilities should explain how post PSPS inspection data informs lessons learned, with the goal for utilities to re-evaluate PSPS thresholds and/or explore alternative solutions (RCRC, GPI, ATC).

WSD-021 does not address this concern with any actionable “key area for improvement or Issue/Remedy requirements. We recommend adding the following Issue/Remedy requirement:

ISSUE: Utilities should explain how post PSPS inspection data informs lessons learned, with the goal for utilities to re-evaluate PSPS thresholds and/or explore alternative solutions.

REMEDY: PGE and IOUs should include a description of how they will integrate post PSPS inspection findings in their PSPS risk modeling methodologies and threshold adjustments.

Section 5.7 Data Governance

WSD-021 identifies a GPS/locational data issue, stating:

Locations which are obviously in error: some of the data submitted in several feature classes, including vegetation management inspections, had no location or were located well outside the continental US.

ISSUE: PG&E’s spatial QDR data submissions have shortcomings that must be remedied. PG&E lacks internal quality control on its data submissions. Data are sometimes incomplete or unexplained.

REMEDY: PG&E must submit correct locations, complete age data, and primary keys (WSD-021, p. 93).

GPI is concerned that large errors in presumably GPS derived location data may be an indicator of other smaller, yet still substantial (e.g. miles) errors in seemingly “accurate” GPS data. While often relatively accurate, phone-derived GPS data can record position data with substantial error. Phone-compatible GPS devices such as Geode, a sub-meter GPS receiver, can substantially improve the accuracy of GPS data collected in the field from mobile devices. Since these data are important for a range of WMP planning and modeling applications it is important to ensure that GPS data are accurate within an acceptable threshold. GPI recommends adding the following requirement to this Issue/Remedy:

REMEDY: PG&E must submit correct locations, complete age data, and primary keys. PG&E must also provide a summary of their GPS data collection hardware and methodology as well as both the accepted/manufacture and field-confirmed accuracy of these methods (e.g. sub-meter, meter, km?).

Section 5.8 Resource Allocation Methodology

PGE-21-27 and -28 – PGE-21-27 requires that “PG&E must provide a detailed RSE verification plan with attainable benchmarks and timeline (WSD-021, p. 98).” GPI supports this key area for improvement and further recommends that the requirement to develop an RSE verification plan should be specifically included in PGE-21-28. PGE-21-28 requires the Utilities to develop a more standardized RSE calculation method. It follows that a unified RSE calculation method should be accompanied with a unified RSE verification method:

The utilities must collaborate through a working group facilitated by Energy Safety to develop a more standardized approach to the inputs and assumptions used for RSE calculations as well as a more standardizes approach to RSE verification. After Energy Safety completes its evaluation of the 2021 WMP Updates, it will provide additional detail on the specifics of this working group.

This working group will focus on addressing the inconsistencies between the utilities’ inputs and assumptions, used for their RSE calculations, which will allow for: 1. Collaboration among utilities; 2. Stakeholder and academic expert input; and 3. Increased transparency (WSD-021, p. 98-99).

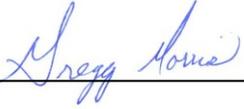
Conclusions

Similar to WSD-019 (SDG&E) and WSD-020 (SCE), GPI generally supports WSD-021 for its capability to drive PG&E’s WMP towards substantial, and global improvements needed to increase IOU transparency, vetting and validation standards for foundational WMP planning tools.

The GPI urges the Commission to adopt our analyses and recommendations.

Dated August 30, 2021

Respectfully Submitted,



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