**BEFORE THE OFFICE OF ENERGY INFRASTRUCTURE SAFETY**

**OF THE STATE OF CALIFORNIA**

# OPENING COMMENTS OF THE UTILITY REFORM NETWORK ON PACIFIC GAS AND ELECTRIC COMPANY'S 2026–2028 WILDFIRE MITIGATION PLAN


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**TABLE OF CONTENTS**

## SUMMARY OF RECOMMENDATIONS

The WMP should not be approved when it continues to default to undergrounding as the preferred solution. TURN offers the following recommendations:

- OEIS should require that PG&E implement a grid hardening selection process that fairly and accurately compares the CBRs of feasible alternatives and implements the solution that provides the safest, quickest, least expensive option.
    - The decision tree should begin with a determination of risk followed by a straightforward CBR comparison of alternatives, in accordance with D.22-12-027.
    - PG&E should be required to revise the undergrounding-biased Decision Tree in its WMP and base its mitigation decision for each location on which of the feasible alternatives has the highest CBR.
    - TURN recommends a three-step process for each high-risk project location to evaluate hardening alternatives:
        1. (A): Calculate CBR of PSPS + EPSS + OH hardening = (Project-specific risk reduction — Risk of PSPS/EPSS) / Project-specific cost
        2. (B): Calculation CBR of Undergrounding: Project-specific risk reduction — Risk of PSPS/EPSS that may still be necessary/ Project-specific cost
        3. Compare (A) vs. (B) and select the alternative with the higher CBR for implementation.
- OEIS should encourage PG&E to view EPSS and PSPS as key elements of a long-term wildfire mitigation strategy and direct that PG&E devote more attention to measures that will reduce outage impacts of EPSS and PSPS.
    - PG&E should develop multiple potential mitigations (e.g., portable generators, rebates for solar plus storage, rebates for permanent generators, etc.) — not just undergrounding — to reduce outage risk from EPSS and PSPS.
    - PG&E should consider, on a location-by-location basis, whether measures such as portable generators and solar plus battery solutions can mitigate much

of the outage risk of EPSS and PSPS, while keeping the CBR of CC+EPSS+PSPS lower than undergrounding.

- OEIS should require PG&E to justify the customer weightings it applies to the consequences of PSPS and EPSS outages, especially those that PG&E categorizes as "CC1" customers.

**OPENING COMMENTS OF THE UTILITY REFORM NETWORK ON PACIFIC GAS AND ELECTRIC COMPANY'S 2026-2028 WILDFIRE MITIGATION PLAN**

The Utility Reform Network ("TURN") submits these comments on the 2026–2028 Wildfire Mitigation Plan ("WMP") submitted by Pacific Gas and Electric Company ("PG&E") pursuant to the Office of Energy Infrastructure Safety Energy Safety Policy Division Process Guidelines, February 2025, Section 4.3, and Revised 2026-2028 Base Wildfire Mitigation Plan Schedule, Feb. 24, 2025.

## I. INTRODUCTION AND SUMMARY

PG&E's WMP presents a continuation of the theme of its prior WMPs — underground whenever feasible and only consider less expensive but equally effective alternatives as a last resort. Accordingly, despite its own data demonstrating that combined mitigations provide ignition risk reduction within a single percentage point of undergrounding, PG&E continues to make insufficient use of combined mitigation efforts.

Section II of these comments details how PG&E skews its decision-making process in favor of undergrounding through the use of a selection tool that results in the choice to underground even if overhead hardening provides equivalent ignition risk reduction and is twice as cost-effective. Section III explains how overhead hardening combined with other mitigations is comparable to undergrounding. Section IV then explains how PG&E's calculation methodology appears to exaggerate outage risks and needs better justification. In Section V, TURN urges OEIS to require PG&E to consider EPSS and PSPS as part of its long-term wildfire mitigation strategy, not just as temporary measures. Finally, after a discussion of the importance of location-specific CBRs in Section VI, TURN recommends that OEIS require PG&E to include

a straightforward CBR comparison of grid-hardening alternatives for each location in Section VII.

TURN does not wholly oppose undergrounding and recognizes that in the highest risk areas, it may be the best tool. However, TURN believes that the selection process should lead to well-targeted mitigation efforts, including undergrounding where it makes the most sense. Such a determination may include the increased risk associated with climate change, but it remains inexcusable to be biased toward undergrounding when it does not increase safety compared to other feasible alternatives. In short, OEIS should require that PG&E implement a grid hardening selection process that fairly and accurately compares the CBRs of feasible alternatives and implements the solution that provides the safest, quickest, least expensive option. The current bias toward undergrounding serves PG&E's interest in maximizing corporate profit at the cost of delay and increased rates for customers.

## II. PG&E'S GRID HARDENING DECISION TREE HEAVILY FAVORS UNDERGROUNDING

The goal of any WMP is to reduce wildfire risk. Indeed, PG&E states that its 2026–2028 WMP presents "a comprehensive strategy to reduce ignitions by implementing mitigations designed to minimize the likelihood of catastrophic wildfires while also maintaining the reliability of the electric system and limiting disruption to customers arising from our mitigation efforts."[1] TURN notes that we support undergrounding under the circumstances where it is demonstrated to be the superior hardening mitigation. Contrary to this view, PG&E's System Hardening Project Scoping Decision Tree ("Decision Tree") in Section 8 demonstrates a continued bias toward undergrounding — an approach that delays benefits to customer safety

[1] PG&E 2026-2028 Base WMP (R0), Vol. 1, page 13 Section 3.1 (Primary Goal)

while increasing the costs to those customers.[2] In 2024, PG&E spent around $1 billion on undergrounding versus about $77 million on implementation of PSPS and $6 million on customer support activities related to PSPS,[3] yet PSPS and EPSS (expenditures for EPSS were not readily available) provide the vast majority of wildfire risk reduction today.[4]

Rather than fairly evaluate alternatives based on local conditions, timeliness, and cost-effectiveness, PG&E continues to rely on "a decision-making process that heavily favors undergrounding."[5] PG&E states that it will use the Decision Tree presented in its WMP to select projects that will begin in 2027.[6] While PG&E states that it "will choose either overhead hardening or undergrounding as the primary mitigation, [and] often implements a hybrid mitigation solution that consists of both overhead hardening and undergrounding on portions of the same circuit segment[,]"[7] the Decision Tree demonstrates a bias toward undergrounding and against overhead hardening. PG&E does so even though it acknowledges in its WMP that the overhead hardening combination of Covered Conductor ("CC"), EPSS, and PSPS (collectively "CC+EPSS+PSPS") achieves virtually the same effectiveness as undergrounding in mitigating ignition risk.[8]

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[2] PG&E 2026-2028 Base WMP (R0), Vol. 1, page 129 Section 6.1.3.1 (Combined Mitigation Effectiveness) ("While undergrounding is the preferred solution for mitigating ignition risk in the highest risk areas, we recognize that undergrounding takes longer to execute than overhead hardening and is a more costly investment in the short term[.]")

[3] PG&E 2024 Q4 Quarterly Date Report tables, Table 11, https://www.pge.com/en/outages-and-safety/safety/community-wildfire-safety-program.html#accordion-99016a73ab-item-4366b98ea7.

[4] See discussion below, Section III.

[5] OEIS Final Decision re PG&E 2022 WMP, p. 144.

[6] PG&E 2026-2028 Base WMP (R0), Vol. 1, page 174, Section 8.2.1 (Project Selection)

[7] PG&E 2026-2028 Base WMP (R0), Vol. 1, page 173, Section 8.2.1 (Project Selection)

[8] PG&E 2026-2028 Base WMP (R0), Vol. 1, Table 6.1.3-1, p. 129. See Section III below for a further discussion of this point and its implications.

PG&E does not dispute its bias toward undergrounding.[9] PG&E states its "approach to system hardening has been, and continues to be, to begin with the mitigation alternative that permanently reduces the greatest amount of risk, which is undergrounding and line removal with remote grid. *If these mitigations do not meet our economic decision criteria*, we consider overhead hardening where it may be considered more effective than undergrounding."[10] In other words, PG&E acknowledges that it begins with undergrounding and will consider overhead hardening only if undergrounding fails to meet its own "economic decision criteria," or if the project is not feasible given the terrain, soil or other factors.[11]

The "economic decision criteria" represent blatant bias toward undergrounding in the "Cost Benefit Analysis" section of PG&E's Decision Tree.[12] If the undergrounding Cost Benefit Ratio ("CBR") is within **fifty percent** of the overhead hardening plus EPSS CBR (and meets the other specified criteria), then PG&E adopts undergrounding as the preferred alternative. In other words, even if an overhead hardening alternative that provides equivalent ignition risk reduction is *almost twice as cost-effective as undergrounding*, PG&E will still move ahead with undergrounding and reject overhead hardening. We note that PG&E does not factor in the "time premium" required to implement undergrounding over and above overhead hardening, which represents further bias toward undergrounding in the Decision Tree.[13] Therefore, for PG&E, the

[9] It should be noted that OEIS has twice admonished PG&E's default to undergrounding approach and PG&E has twice ignored the admonishment. OEIS Final Decision re PG&E's 2022 WMP, pp 79-80; 144 & OEIS Final Decision re PG&E's 2025 WMP, pp. 43-46.

[10] Response to DR TURN_002_Q10(b) (emphasis added).

[11] PG&E 2026-2028 Base WMP (R0), Vol. 1, p. 119, Section 6.1.2 (Feasibility Constraints) ("in certain circumstances we may choose to overhead harden a circuit segment or portion of a circuit segment because of feasibility constraints. In these cases, we continue to monitor the risk profile of the overhead hardened segment and ensure that additional programs such as EPSS are in place to mitigate the risk.")

[12] PG&E 2026-2028 Base WMP (R0), Vol. 1, Figure PG&E-8.2.1-2, p. 176.

[13] Response to DR TURN_003_Q5(a): "While speed of initiative construction has not explicitly been incorporated into PG&E's risk modeling and cost-benefit ratios, PG&E manages its suite of wildfire

project that increases PG&E's rate base and profits is justifiable even when that project is one-half as cost-efficient as an equally effective alternative.

PG&E has not explained and cannot justify the 50% CBR criterion for undergrounding in its Decision Tree. In discovery, PG&E characterized this threshold as a "discretionary value intended to ensure that CBR remains a key consideration, while also allowing for the engineering team to weigh the full range of benefits. . . ."[14] However, even if a "discretionary value," PG&E does not explain why 50% is reasonable and in the public interest. And, contrary to PG&E's statement, incorporating such a large preference in the CBR comparison for undergrounding does not allow PG&E to consider the full range of benefits of *overhead hardening*. Instead, it arbitrarily precludes overhead hardening as an option even when CC+EPSS+PSPS delivers commensurate risk reduction more quickly at a much lower cost and impact on the surrounding environment.

As discussed in the following sections, PG&E's analysis makes clear that overhead hardening combined with EPSS and PSPS should be treated on a level playing field with undergrounding.

## III. AS PG&E NOW ADMITS, OVERHEAD HARDENING COMBINED WITH EPSS AND PSPS PROVIDES IGNITION RISK REDUCTION EQUIVALENT TO UNDERGROUNDING

PG&E's 2026-2028 WMP acknowledges that ignition risk reduction comparable to undergrounding can be achieved by overhead hardening combined with other mitigations. The WMP recognizes that CC+EPSS+PSPS is 97% effective in reducing ignition risk, which is

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mitigation initiatives to minimize cumulative risk exposure and does account for the time value of risk based on the useful life of the asset."

[14] Response to DR TURN_002_Q10(a).

nearly identical to primary line undergrounding's 98% effectiveness value.[15] Over time, other technologies, such as REFCL,[16] have the potential to make overhead hardening even more effective at reducing ignition risk.

Nevertheless, PG&E disfavors alternatives that include EPSS and PSPS because EPSS and PSPS include outage risk that reduces reliability.[17] TURN agrees that, when deciding between alternatives, outage risk to customers needs to be considered.[18] However, the CBR calculation includes temporary outage risk as an offset to the benefits of overhead hardening combined with EPSS and PSPS. Accordingly, accurately calculated CBRs already consider any reliability disadvantages of overhead hardening alternatives that include EPSS and PSPS. This means that, when comparing undergrounding with CC+EPSS+PSPS, a lower CBR for undergrounding for a given location would show that, even when the outage impacts of EPSS and PSPS are considered, the combination of overhead hardening mitigations provides more *net* risk reduction benefits per dollar than undergrounding.

In sum, because the CBR already accounts for outage impacts, there is no justifiable reason to prefer undergrounding if its CBR is less than the overhead hardening alternative, let alone 50% less.

## IV. OUTAGE RISK SHOULD BE ACCURATELY CALCULATED IN THE CBR

It is important that PG&E accurately account for outage risk to customers. PG&E applies various weights to its calculation of consequence from PSPS outages to reflect the reality that

[15] PG&E 2026-2028 Base WMP (R0), Vol. 1, Table 6.1.3-1, p. 128.

[16] PG&E 2026-2028 Base WMP (R0), Vol. 1, p. 336.

[17] Response to DR TURN-002-Q04.

[18] PG&E's WMP notes that undergrounding does not always eliminate the outage risk associated with EPSS and PSPS, depending on whether upstream circuit segments have been hardened. *See,* PG&E 2026-2028 Base WMP (R0), Vol. 1, p. 195. Thus, outage risk must be considered both for overhead hardening *and undergrounding*.

customers are impacted with varying degrees of severity from power outages. These weights range from "extreme" critical customers (called "CC1") which are given a weight of 100, to "elevated," given a weight of 2. PG&E's critical customer weighting table is reproduced below.

**Table 1. PG&E's Critical Customer Weightings to Estimate Consequence of PSPS Events**[19]

| Customer Type | Customer Weighting | Customer Category |
|---|---|---|
| Extreme | 100 | CC1 |
| Significant | 5 | Life Support, Medical Baseline & Low Income, Life Support & Low Income |
| Elevated | 2 | CC2, CC3, CE1, CE2, CE3, EE, PR1, SC1, SC2, SC3, SE1, SE2, SE3, TE1, TE2, TT1, TT2, Medical Baseline, -Self-Identified Vulnerable, --Self-Identified Disabled, Low Income |
| Regular Customer | 1 | Regular Customer |

PG&E explains that CC1 customers represent emergency services "such as hospitals, fire, and police stations."[20]

PG&E should clarify whether its PSPS consequence calculations incorporate the presence of facility backup power; if not, this is a significant shortcoming of this analysis leading to highly inaccurate estimates of PSPS consequence. CC1 facilities in particular are often *required by law* to have backup power, because these represent essential services.[21] For example, federal laws pertaining to Medicare and Medicaid require health care facilities "to have a normal electrical power source and an alternate emergency power source provided to certain patient care rooms, equipment, and systems by an essential electric system, where the loss of normal power is likely to result in injury or death."[22] Additionally, per California state law, "skilled nursing

[19] PG&E 2026-2028 Base WMP (R0), Vol. 1, p. 69.

[20] PG&E 2026-2028 Base WMP (R0), Vol. 1, p. 68.

[21] We note that TURN was not able to conduct an exhaustive analysis of laws, regulations, and common practice for these facilities.

[22] Center for Medicare and Medicaid, https://www.cms.gov/files/document/qso-23-11-lsc.pdf.

facilities" must have no less than 96 hours of backup power.[23] It is likely that many fire stations, particularly in high fire risk areas, currently have backup power, efforts which have been supported by PG&E.[24] At minimum, AB 944 mandates at least 96 hours of backup power for fire stations by January 1, 2026 (coinciding with the beginning of the WMP planning period).[25] Additionally, many cities applied for and received funding in 2020 for backup power to public buildings, including police and fire stations throughout the state, information which is publicly available.[26]

For other categories of customers, such as medical baseline and disabled customers, PG&E has rightly focused its efforts on providing rebates and other support to these customers for provision of backup power.[27] It is not clear whether these efforts, where PG&E has direct information on provision of backup power to its customers, are reflected in PG&E's estimate of PSPS consequence. If reasonable estimates of the presence of backup power have not been incorporated into PG&E's PSPS consequence calculations, OEIS should ensure this is incorporated so that the estimate of risk from PSPS is reasonable, and targeted mitigations for PSPS can be appropriately tailored in coming years.

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[23] AB 2511, https://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill_id=202120220AB2511&showamends=false.

[24] PG&E, *Support for Critical Facility Customers,* https://www.pge.com/assets/pge/docs/outages-and-safety/safety/critical-facilities-customer-fact-sheet.pdf.

[25] AB 966, https://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill_id=202320240AB944&showamends=false.

[26] California Office of Emergency Services, *Fiscal Year 2019-20 Public Safety Power Shutoff Resiliency Allocation Program,* https://www.caloes.ca.gov/wp-content/uploads/Legislative-Affiars/Documents/FY-19-PSPS-2nd-Leg-Report-letter-10.27.23.pdf.

[27] PG&E 2026-2028 Base WMP (R0), Vol. 1, p. 513-514.

## V. ENERGY SAFETY SHOULD ENCOURAGE PG&E TO VIEW EPSS AND PSPS AS KEY ELEMENTS OF A LONG-TERM WILDFIRE MITIGATION STRATEGY, INCLUDING PURSING COST-EFFECTIVE MEASURES TO FURTHER REDUCE OUTAGE RISK

PG&E views EPSS and PSPS as only temporary strategies to address wildfire risk. However, perhaps inadvertently, PG&E's WMP demonstrates that this is not the case — instead, even with large-scale undergrounding, EPSS, PSPS and similar technologies are a key part of its long-term wildfire mitigation strategy.

In the near-term, PG&E's own figures show that EPSS and PSPS provide the majority of its wildfire risk reduction. Figure 6.1.3.2-1 shows that, in 2026, PG&E expects EPSS and PSPS to reduce risk **by 66%** — even when PSPS and EPSS adverse consequence impacts are included.[28] Figure 6-1 shows that, in 2026, "resiliency mitigations" such as undergrounding and covered conductor will only supply approximately 7% of PG&E's overall service territory risk reduction, and that the remaining approximately 63% of risk reduction will come from "operational mitigations" such as EPSS and PSPS.[29] Even *after* the completion of PG&E's preferred 10-year undergrounding program, most of the residual risk reduction in 2033 would still be derived from operational mitigations —75% of the total risk reduction.[30]

PG&E's risk modeling and analyses demonstrates that EPSS and PSPS are, by far, the most effective and efficient wildfire mitigation strategies that PG&E now deploys and will remain so into the future. And, although the complete cost data are not readily available in PG&E's WMP, EPSS and PSPS are clearly much less expensive and far more cost-effective than

[28] PG&E 2026-2028 Base WMP (R0), Vol. 1, p. 136. (Calculated using the monetized risk scores provided in Figure 6.1.3.2-1, Wildfire (pre-EPSS/PSPS) of $19,578 compared to Wildfire (post-EPSS/PSPS) of $3,566, for a reduction of $16,012 plus PSPS consequence of $1953 and EPSS consequence of $1049, for a net reduction of $13010 or 66.45%.

[29] *Id.*, p. 149. (Figures in text are approximate based on the graph in Figure 6-1.)

[30] *Id.*

undergrounding. For example, as previously noted, in 2024, PG&E spent around $1 billion on undergrounding versus about $77 million on implementation of PSPS and $6 million on customer support activities related to PSPS (expenditures for EPSS were not readily available),[31] yet PSPS and EPSS provide the vast majority of wildfire risk reduction (see above).[32]

In addition, as noted previously, PG&E's risk analysis does not account for the longer timeframe to implement undergrounding versus an overhead hardening strategy that includes EPSS and PSPS. On average from 2020-2024, undergrounding projects have been 51% slower to deploy than overhead hardening projects on a per mile basis, taking 443 days per mile versus 294 days per mile for undergrounding and overhead hardening projects, respectively. PSPS and EPSS are mitigations available *today* to provide significant wildfire risk reduction.

**Table 2. Risk Premium due to time of UG vs. OH Hardening (2020-2024)**[33]

| ***OH Program*** | **Total (2020–2024)** |
|---|---|
| OH Miles | 812 |
| OH – Total Days | 238,742 |
| | |
| Days per OH Mile Hardened [Overhead Hardening] | 294 |

| ***UG Program*** | **Total (2020–2024)** |
|---|---|
| UG-Miles* | 535 |
| UG-Days | 237,256 |
| | |
| Days per OH Mile Hardened [Underground Hardening] | 443 |

**Number of UG miles are in units of overhead miles replaced to appropriately compare with the overhead hardening program.*

[31] PG&E 2024 Q4 Quarterly Date Report tables, Table 11, https://www.pge.com/en/outages-and-safety/safety/community-wildfire-safety-program.html#accordion-99016a73ab-item-4366b98ea7.

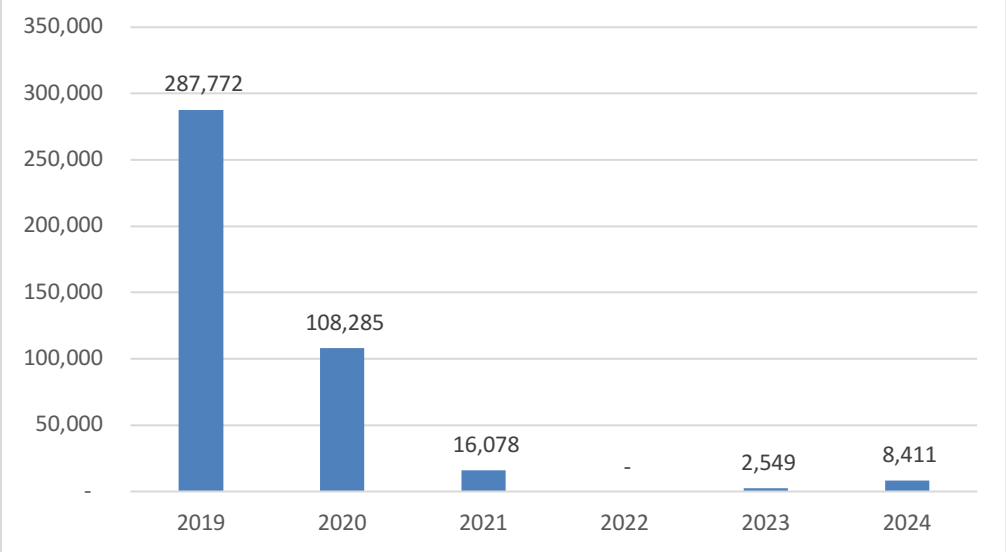
[32] See Discussion in Section III, above.

[33] Calculated from TURN-5 attachment "WMP-Discovery2026-2028_DR_TURN_005-Q001Atch01."

Each of these factors make the case for less bias against overhead hardening strategies that include EPSS and PSPS, while focusing more on additional strategies to reduce the reliability impacts of these mitigations. For example, PG&E should consider, on a location-by-location basis, whether supplying portable generators, or solar plus battery solutions, can mitigate much of the outage risk of EPSS and PSPS, and still make CC+EPSS+PSPS more cost-effective than undergrounding.

We note that PG&E has already achieved success at reducing the outage risk of PSPS; attitudes toward PSPS may be somewhat skewed by the horrendous reliability impacts of PSPS when PG&E first deployed it (poorly) in 2019. Since then, PG&E has consistently improved its targeting of PSPS events to reduce outages experienced by customers, as discussed in the utility's WMP.[34] The figure below shows the average number of customers de-energized per PSPS event from 2019-2024.

**Table 3. Average Number of Customers Impacted per PSPS Event (2019-2024)[35]**

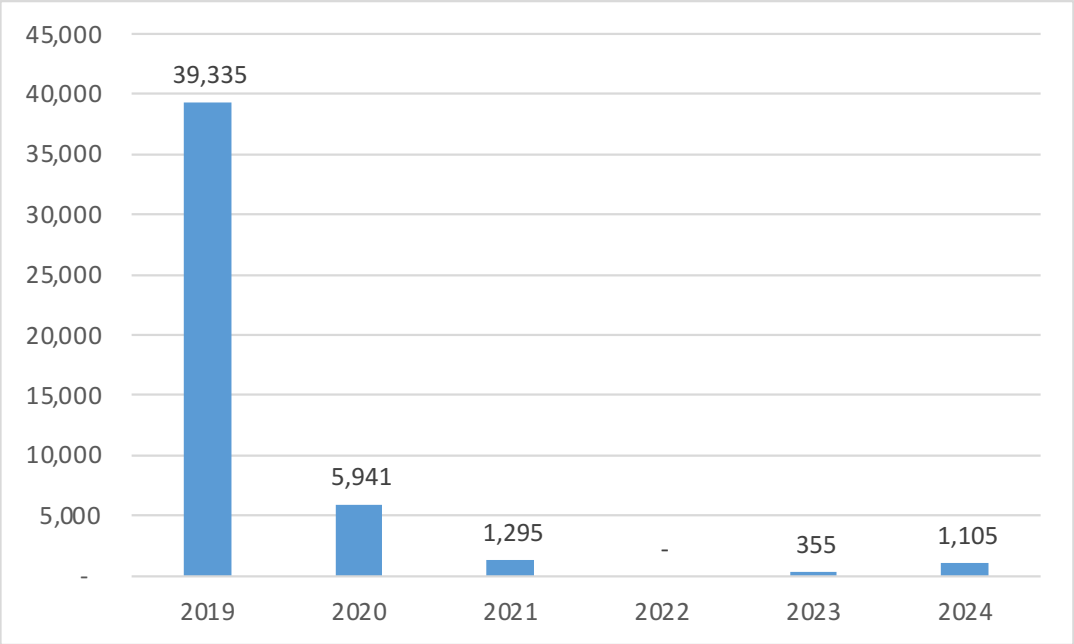



[34] See, for instance, PG&E 2026-2028 Base WMP (R0), Vol. 1, p. 464.

[35] 2019-2021 from TURN testimony in A.21-06-021 (TURN-11), p. 53. In 2022 there were no PSPS events. 2023-2024 calculated from 2023 and 2024 Post Season Data Reports,

This trend is also apparent in annual customer outage duration statistics. The figure below shows customer outage minutes per red flag warning ("RFW") circuit mile day ("CMD"), which adjusts outage minutes to reflect relative differences in the weather each year (which drives, or should drive, the number and scale of PSPS events), as measured by the RFW CMD statistic.

**Table 4. Customer Minutes of Outage per RFW CMD (2019-2024)**[36]




Clearly, PSPS is much more targeted and causes a much shorter average outage than was the case in 2019 through 2021. This progress, particularly if continued even to a less dramatic degree, enables future efforts to mitigate the remaining undesirable impacts of PSPS (such as portable generators) to be more targeted and cost-effective than undergrounding.

https://www.pge.com/en/outages-and-safety/safety/community-wildfire-safety-program/public-safety-power-shutoffs.html#accordion-d66e9be4b5-item-69fa328e8d.

[36] 2019–2021 from TURN testimony in A.21-06-021 (TURN-11), p. 53. In 2022 there were no PSPS events. 2023-2024 calculated from Post Season Data Reports, https://www.pge.com/en/outages-and-safety/safety/community-wildfire-safety-program/public-safety-power-shutoffs.html#accordion-d66e9be4b5-item-69fa328e8d. RFW CMDs from TURN-3, question 6 attachment "WMP-Discovery2026-2028_DR_TURN_003-Q006Atch01."

With respect to EPSS, TURN understands PG&E is working on several mitigation strategies to reduce the impact of EPSS outages on customers,[37] though we believe greater emphasis and analysis for outage mitigations is warranted. While we were not able to conduct a historical outage analysis similar to PSPS (above), we note that PG&E is able to restore power after an EPSS outage, on average, within seven hours. However, this masks a massive variance in restoration times, shown below.

**Table 5. EPSS Outage Restoration Time 2024 (Hours)**[38]

| Month (2024) | Average Restoration Time | Minimum Restoration Time | Maximum Restoration Time |
|---|---|---|---|
| 1 | 1 | 1.1 | 1.1 |
| 5 | 12 | 0.1 | 482.1 |
| 6 | 6 | 0.1 | 171.6 |
| 7 | 8 | 0.1 | 569.4 |
| 8 | 6 | 0.1 | 325.1 |
| 9 | 6 | 0.1 | 305.3 |
| 10 | 6 | 0.1 | 478.7 |
| 11 | 7 | 0.1 | 564.3 |
| 12 | 5 | 0.2 | 18.4 |
| **Average** | **6.8** | | |

It is possible that the minimum and maximum figures for each month may be errors in the data provided by PG&E in its analysis of EPSS reliability. If not, while the maximum outage times shown are outliers given the overall averages, PG&E should investigate and provide Energy Safety with a better explanation of why restoration times took up to a maximum of 24 days (July 2024).

[37] PG&E EPSS, https://www.pge.com/en/outages-and-safety/safety/community-wildfire-safety-program/enhanced-powerline-safety-settings.html.

[38] PG&E EPSS Reliability Analysis, https://www.pge.com/en/outages-and-safety/safety/community-wildfire-safety-program.html?WT.mc_id=Vanity_wildfiremitigationplan#accordion-99016a73ab-item-c788794778.

As discussed above, PG&E should also propose multiple potential mitigations (e.g., portable generators, rebates for solar plus storage, rebates for permanent generators, etc.) — not just undergrounding — to reduce these outage times. At minimum, these extreme events may shed light on how to target mitigations to reduce the most significant outage impacts of EPSS and also, potentially, PSPS.

## VI. LOCATION-SPECIFIC CBRs TAKE INTO ACCOUNT ALL RELEVANT FACTORS IN CHOOSING AMONG MITIGATION ALTERNATIVES AND PG&E IS WELL CAPABLE OF MAKING SUCH CALCULATIONS AT AN APPROPRIATELY GRANULAR LEVEL

PG&E's undergrounding-biased Decision Tree shows that PG&E views three factors as potentially justifying undergrounding, even when overhead hardening remains an option after the Decision Tree box in which undergrounding is given a 50% cost-effectiveness preference (discussed above). Those factors are: 1) High tree strike potential (defined as a score of 6 or more); 2) Egress / Ingress concerns; and 3) Whether a PSPS polygon affects "only part of the CPZ."[39]

Regarding "tree strike potential," the first thing to note is that trees expected to fall into utility power lines are supposed to be removed as part of the utility's routine vegetation management program.[40] Therefore, PG&E should clarify how it assesses this criterion, and why it believes its vegetation management practices do not sufficiently account for high tree strike risk. With respect to Egress / Ingress, PG&E's data request responses to TURN show these "concerns" are extremely varied, vaguely defined, and based on highly subjective utility

[39] PG&E 2026-2028 Base WMP (R0), Vol. 1, Figure PG&E-8.2.1-2, p. 184.

[40] PG&E Distribution Vegetation Management, p. 2, https://www.pge.com/assets/pge/docs/outages-and-safety/outage-preparedness-and-support/td-7102s-distribution-vegetation-management-program.pdf. PG&E's VM program requires action to remediate circumstances where "Vegetation (categorized as either a whole tree or portion of tree) . . . may fall into or otherwise impact PG&E electric facilities."

judgement.[41] For a utility that admits its "preference" is for undergrounding power lines, this type of criterion within the decision tree will lead to the obvious outcome of more projects slated for undergrounding.

Putting these issues aside, the three factors that PG&E indicates require additional consideration in its decision tree can and should be incorporated into risk modeling and CBR comparisons of hardening alternatives, which is a more transparent approach for determining the appropriate hardening strategy compared with PG&E's qualitative, nebulous decision tree. Indeed, the latest iteration of PG&E's Wildfire Distribution Risk Model ("WDRMv4") incorporates highly granular and location-specific risk analysis that differentiates the probability of ignition by driver (e.g. vegetation vs. equipment failure, etc.),[42] as well as wildfire consequence by location of utility assets.[43] PG&E, to its credit, is therefore well-positioned to accomplish highly granular, project/location-specific risk analyses that incorporate a range of project-specific factors, including the three factors discussed above that are highlighted for special attention in the Decision Tree. For example, if "tree strike risk" is higher for a particular circuit segment, there is a greater probability that the estimated risk reduction from overhead hardening will decrease. Further, PG&E's risk model considers egress issues in the calculation of

[41] PG&E responses to DR TURN_002_Q010(d) and TURN_004_Q005(c) ("The PSS considers many factors when evaluating ingress and egress concerns, and it is not possible to identify each and every criterion and how that criterion particularly impacts risk in every situation.")

[42] WDRM v4 Documentation, p. 19, online: https://www.pge.com/assets/pge/docs/outages-and-safety/outage-preparedness-and-support/wildfire-distribution-risk-model-documentation-v4.pdf. PG&E states in part "A focused effort was made to improve the quality of the event probability datasets. Historical event records were reviewed to correctly attribute failures and ignitions to their correct cause and equipment asset relationships were improved so that risk could be determined and aggregated appropriately."

[43] *Id.,* p. 15.

wildfire consequence.[44] The point is that CBR calculations already incorporate these factors.

In Decision (D.) 22-12-027, the CPUC directed utilities to transition from calculating Risk Spend Efficiency ("RSE") values to Cost-Benefit Ratios ("CBR"), determined by computing the dollar value of a mitigation's risk reduction benefit by the cost of the mitigation.[45] PG&E is required to use the CBR for cost effectiveness calculations in CPUC proceedings beginning in 2024.[46] In its 2023-2025 WMP, PG&E attempted to create a different measure, the Wildfire Benefit-Cost Analysis.[47] Here, PG&E once again attempts to create its own measure by incorporating these "discretionary" measures into its Decision Tree. PG&E's approach is a continuation of its approach in its prior two WMPs, both of which were rightfully criticized. Despite prior admonitions, PG&E has determined that undergrounding is the preferred approach and continues to manipulate its decision-making process and risk assessment to support that determination. Instead, the decision tree should begin with a determination of risk followed by a straightforward CBR comparison of alternatives, in accordance with D.22-12-027.

## VII. BECAUSE OVERHEAD HARDENING WITH EPSS AND PSPS PROVIDES THE SAME IGNITION RISK REDUCTION BENEFITS AS UNDERGROUNDING, PG&E'S GRID HARDENING SELECTION PROCESS SHOULD BE BASED ON A STRAIGHTFORWARD CBR COMPARISON OF ALTERNATIVES FOR EACH LOCATION AT RELATIVELY HIGH-RISK LOCATIONS

The foregoing analysis has shown that CC+EPSS+EPSS provides almost identical ignition risk reduction benefits as undergrounding. It has also shown that the CBR takes into account outage risk and other factors that should be considered, such as tree-strike and

[44] *Id., e.g.,* p. 1, 7, 12. While TURN does not fully understand the "PSPS polygon" criteria, additional PSPS criteria can be incorporated into the mitigation effectiveness and/or consequence of PSPS, which impacts the CBR calculation.

[45] CPUC Decision 22-12-027, p. 25.

[46] *Id.*, p. 63.

[47] PG&E 2023-2025 WMP (R3), p. 422.

ingress/egress risk. For this reason, PG&E should be required to revise the undergrounding-biased Decision Tree in its WMP and base its mitigation decision for each location on which of the feasible alternatives has the highest CBR. The WMP should not be approved when it continues to default to undergrounding as the preferred solution because, as shown, undergrounding is not a reasonable solution when an alternative provides the same — and more timely — benefits at lower cost.

TURN recognizes that our recommendation to compare CBRs of hardening alternatives are also subject to a degree of judgment and potential bias on the part of PG&E. Still, our proposed methodology is simpler, more transparent, and geared to accelerate risk reduction and project-level decision-making compared with PG&E's convoluted and biased Decision Tree from which one answer — undergrounding — is prioritized over other solutions that may be more cost-effective and less resource intensive.

## VIII. CONCLUSION

For the reasons set forth above, TURN urges Energy Safety to adopt the recommendations in these Comments.

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Respectfully submitted,

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