Diane Conklin
Spokesperson
Mussey Grade Road Alliance
PO Box 683
Ramona, CA 92065

September 11, 2024 VIA ELECTRONIC FILING

Tony Marino
Acting Deputy Director
Electrical Infrastructure Directorate
Office of Energy Infrastructure Safety

RE: MUSSEY GRADE ROAD ALLIANCE COMMENTS ON OFFICE OF ENERGY SAFETY INFRASTRUCTURE DRAFT DECISION ON SOUTHERN CALIFORNIA EDISON COMPANY 2025 WILDFIRE MITIGATION PLAN UPDATE

Dear Acting Deputy Director Marino,

The Mussey Grade Road Alliance (MGRA or Alliance) files these comments pursuant to the Cover letter to the Stakeholders for Southern California Edison Company 2025 Wildfire Mitigation Update[1] which authorizes stakeholders to file comments on SCE's and SDG&E's 2023-2025 Wildfire Mitigation Plan Draft Decisions by September 11th, 2024. The Alliance filed comments on the 2022 Wildfire Mitigation Plans of all major IOUs April 11, 2022,[2] and filed Reply Comments on April 18, 2022.[3]

The Alliance reply comments are authored by the Alliance expert, Joseph W. Mitchell, Ph.D.

[1] 2023-2025-WMPs; OFFICE OF ENERGY INFRASTRUCTURE SAFETY; DRAFT DECISION; 2025 SOUTHERN CALIFORNIA EDISON COMPANY 2025 WILDFIRE MITIGATION UPDATE (Draft Decision or DD)
[2] 2023-2025-WMPs; MUSSEY GRADE ROAD ALLIANCE COMMENTS ON 2023-2025 WILDFIRE MITIGATION PLANS OF PG&E, SCE, AND SDG&E; May 26, 2023. (MGRA Comments)
[3] 2023-2025-WMPs; MUSSEY GRADE ROAD ALLIANCE REPLY COMMENTS ON 2023-2025 WILDFIRE MITIGATION PLANS OF PG&E, SCE, AND SDG&E; June 6, 2023. (MGRA Reply)

Respectfully submitted this 11th day of September, 2024,

By: __*/S/*____***Diane Conklin***_____

Diane Conklin
Spokesperson
Mussey Grade Road Alliance
P.O. Box 683
Ramona, CA 92065
(760) 787 – 0794 T
(760) 788 – 5479 F
dj0conklin@earthlink.net

COMMENTS ON THE OFFICE OF ENERGY SAFETY INFRASTRUCTURE DRAFT DECISION ON SOUTHERN CALIFORNIA EDISON 2025 WILDFIRE MITIGATION PLAN UPDATE ON BEHALF OF THE MUSSEY GRADE ROAD ALLIANCE

The Mussey Grade Road Alliances' (MGRA or Alliance) comments are authored by MGRA's expert witness Joseph W. Mitchell, Ph.D.[4]

1. INTRODUCTION

MGRA supports portions of Energy Safety's Draft Decision for Southern California Edison 2025 Wildfire Mitigation Plan Update, and appreciates that OEIS recommends adopting MGRA suggestions in the areas of covered conductor.

As MGRA noted in its comments in last year's comments, OEIS has taken a cursory view of the utility plans and has not delved particularly deeply into some areas, leaving fairly extensive swathes of the utility safety landscape only partially examined or entirely ignored. It is in these areas that external stakeholders who might have specialized knowledge or expertise may be particularly helpful. Integrating this input in a correct manner improves regulation. However, this year's update review seems to have further restricted its scope from last year's.

The timing for this reduction of supervision could not be worse. It is precisely now that all three major utilities are deploying their hardening programs, and advanced wildfire mitigation technologies, and to a great extent the ratios chosen depend on the calculated efficiencies of these mitigations. These estimates are still in flux, as shown in MGRA's WMP comments. However, to a large extent utilities are not being asked to keep these as open questions as they move into their 2026-2028 WMPs. The Commission and public trust the OEIS to set the standards by which utility wildfire mitigation is measured, and this information is needed immediately and not at utility discretion late in the 2026-2028 cycle.

For these reasons MGRA believes that additional analysis and scrutiny must go into the final Decision in order for it to be appropriate for Commission ratification.

---

[4] M-bar Technologies and Consulting, LLC; http://www.mbartek.com; Email: jwmitchell@mbartek.com. Dr. Mitchell is also a board member of the Mussey Grade Road Alliance.

2. GENERAL IMPROVEMENTS FOR THE DRAFT DECISION

2.1. Reduced Scope and Depth of the Review of the Draft Decisions

In its 2023 WMP review of the 2023-2025 Wildfire Mitigation plan updates, MGRA noted that the overall scope and depth of the review had significantly decreased from what were previously in-depth and comprehensive analyses. MGRA noted that the ratio of the number of pages in the Draft Decision to the ratio of pages submitted had dropped more than 50%. Among MGRA's recommendations was to ensure that the Wildfire Mitigation Plan reviews were adequately staffed and resourced.

For the 2024 decisions on the 2025 Wildfire Mitigation Plan Update, Energy Safety review is even briefer and less in-depth. Of course, the 2025 Update is only supposed to note critical modifications to the previous full WMPs, so it is understandable that it should not require the full resources allocated to a full Wildfire Mitigation Plan. However, determinations in the Draft Decision help to set the scope for the upcoming 2026-2028 WMPs and so it is important that key issues remain live during this period.

2.1.1. Reporting versus Evaluation

For most of the technical sections, the recitation of what the utility reported is described in adequate detail with relevant citations to the utility's wildfire mitigation plan update. This is followed by a "Energy Safety Evaluation" section. The vast majority of these "Energy Safety Evaluation" sections are substantially shorter than the descriptive section, often just consisting of a short paragraph or as little as a single sentence. This makes the Draft Decision read more like a compliance audit, where required materials are checked but not verified.

Evidence for this can be seen in the citations. For example, the SCE Draft Decision contains 196 citations. Only 4 of these citations are to data requests rather than utility source material or previous WMPs and decisions. This leaves the impression that the Draft Decision was largely based on a cursory review of utility materials rather than a critical analysis of the utility WMP update.

Of particular concern are the issues for which Energy Safety is requiring no further reporting or no further improvement on for the 2026-2028 WMPs, which will be a major update. Many of these issues, at least according to stakeholders, still are under significant flux and may be controversial. For SCE, these include:

- Issues related to hardening, including covered conductor and undergrounding
- Risk models
- AFN needs
- PSPS impacts
- Comparison of other mitigations to undergrounding

2.1.2. Integrating Stakeholder Input

Additionally, OEIS incorporation of external stakeholder input was minimal, with no stakeholder data requests cited in SCE 2025 Update Appendix C. While it would be presumptuous for stakeholders to state their value to the WMP process, OEIS management has always allowed stakeholders to have a voice in OEIS processes and feedback has often been incorporated into OEIS's final products. Many stakeholders, such as MGRA, have a deep interest and stake in the prevention of catastrophic wildfires and control over mitigation costs and have appreciated the opportunity to participate in these efforts.

The California Public Utilities Commission (CPUC), also recognizes the value that stakeholders play in the review of wildfire mitigation plans, particularly as it is the duty of the CPUC to review and ratify these plans, and that specifically it was in the interest of adhering to Commission requirements that intervenors be able to participate in plan reviews. In D.22-09-023, the Commission states that:

"*In short, the Pub. Util. Code has created a complex and interrelated regulatory scheme to address utility wildfire risks. The work of the Commission and Energy Safety is dependent upon and informs each other, and the participation of intervenors in the WMP reviews at Energy Safety is essential to assisting the Commission in performing its statutory duties. Given the required ratification of the WMP disposition by the Commission, the Commission's determination of ratemaking impacts of approved WMPs, the Commission's role in enforcing WMPs, and the*

importance of ensuring the WMPs adhere to Commission requirements, we find as a matter of policy that it is consistent with the objectives of the statute to encourage the effective participation of intervenors in the WMP reviews at Energy Safety."[5]

While it may be OEIS's prerogative to determine what level of scrutiny Wildfire Mitigation Plans and their updates must undergo, these determinations feed into California Public Utility Commission determinations that affect utility spending and liability. They can also be utilized as an "unbiased" source of utility data and analysis. For this reason, the CPUC must ratify each WMP Decision produced by OEIS to ensure that it meets Commission needs. MGRA suggests that OEIS re-evaluate issues that are particularly sensitive or active, providing additional content to the current review, to ensure that utilities continue to provide the required materials in their 2026-2028 WMPs.

3. TECHNICAL ISSUES

3.1. Calculating Risk Scores Based on Maximum Consequence Values

3.1.1. 6.2.2 SCE-23B-02. Calculating Risk Scores Using Maximum Consequence Values

While MGRA concurs with the conclusion of Energy Safety's assessment, Energy Safety fails to correctly express the nature and operation of SCE's multiple models and their implications. Energy Safety should note that SCE employs two risk models: Its MARS probabilistic risk model that it uses for calculation of enterprise risk, legacy prioritization for covered conductor, and operational decision-making, and IWMS, which it uses for prioritization of future hardening, primarily for its targeted undergrounding program (TUG).[6]

In its summary of SCE's filing, OEIS notes that: "*In response, SCE indicated that it does not plan to make a transition from maximum consequence to probability distribution in its 2026-2028 Base WMP. SCE asserted that maximum consequence values are crucial for identifying catastrophic wildfires, which are infrequent but severe and not adequately predicted by normal probability distributions. SCE stated that its current methodologies, which include deterministic,*

[5] p. 4.
[6] MGRA Comments; pp. 17-19.

physics-based models validated by satellite data and academic research, provide accurate outputs for known risk and better location-specific risk assessments."[7]

This is not entirely accurate, and the language is potentially confusing. First, what SCE classifies as "maximum consequences" is based on an 8 hour run of its Technosylva consequence model. This does not actually describe the full consequences of catastrophic wildfires that burn for more than 8 hours, for example the 2007 Witch fire. SCE's wildfire simulations cut off at around 20,000 hectares in size.[8] This leads SCE's consequence model to be an underestimate, even if "maxima" are used.

The second issue is the use of the term "normal probability distributions". This has two very distinct possible meanings and OEIS should distinguish between the two of them. In statistics, a "normal" probability distribution describes a "bell-curve" or "Gaussian" distribution, used to describe random variations around an expected value. The term "normal probability distributions", because of the plural of "distributions", can also mean "probability distributions that are typically used", which may include probability distributions other than Gaussian that might be more appropriate for describing wildfire sizes. The use of a normal or Gaussian distribution to describe wildfire damages would never be appropriate because that is simply not the size distributions that wildfires follow.

PG&E and SDG&E use a truncated power law distribution to model consequences. This has been adopted as a Commission best practice in its recent decision D.24-05-064.[9]

3.1.2. Lahaina

As Energy Safety notes, SCE uses the Lahaina disaster as a reason to use maximum consequences, though MGRA in the last section showed that SCE's maximum consequences do not approach real world maximum consequences. In fact, it would have been straightforward to have prevented the Lahaina tragedy with a contingency plan including power shutoff. Had California

---

[7] DD; p. 13.
[8] OEIS; 2021-WMPs; MUSSEY GRADE ROAD ALLIANCE COMMENTS ON 2021 WILDFIRE MITIGATION PLANS OF PG&E, SCE, AND SDG&E; March 29, 2021; p. 44. (MGRA 2021 WMP Comments)
[9] CPUC D.24-05-064; pp. 49-57.
https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M533/K099/533099839.PDF

legislators, regulators, and utilities proselytized their PSPS strategy for other parts of the world that have not yet significantly hardened electric utility infrastructure and where climate change is causing unexpected incidences of extreme weather, Lahaina might have been saved.

3.1.3. 6.2.2.1 Energy Safety Evaluation

OEIS concludes: "Currently, SCE is using maximum consequence values with no plans to transition towards using probability distributions. SCE's response provides sufficient information demonstrating that its current methodology for using maximum values is more accurate for determining catastrophic fires when compared to the use of averages, which was one of the requirements form the area for continued improvement. SCE also provided sufficient information on why it uses a deterministic model as opposed to a probabilistic model. However, SCE must continue to report on its progress for exploring probability distributions in the future given higher accuracy across risk scores compared to aggregation of maximum values.

For this reason, Energy Safety has modified the area for continued improvement to provide additional guidance for SCE. SCE must respond to this revised area for continued improvement in its 2026-2028 Base WMP.

Section 11 provides all areas for continued improvement for SCE, including the specific required progress that SCE must address in its 2026-2028 Base WMP."[10]

MGRA concurs that SCE has no plans to create a probabilistic model. However, SCE's ability to freely use its consequence-only IWMS prioritization model has been curtailed recently by the CPUC in D.24-05-064, which states "*We agree with MGRA that any approach to modeling tail risks must be risk-informed, meaning that all modeling approaches must be based on a product of LoRE and CoRE. As such, a White Paper that presents justification for a model based purely on consequences will be rejected because such a model is fundamentally at odds with the RDF as written in D.22-12-027*."[11]

For OEIS to omit explicit mention of IWMS was an error, as this strategy forms the current backbone of SCE's prioritization.

[10] DD; p. 14
[11] Pp. 55-56.

3.1.4. SCE-25U-01. Calculating Risk Scores Using Maximum Consequence Values

OEIS does not provide guidelines that will achieve results with SCE, which has stated it does not want to implement a probabilistic plan. To find that "*SCE needs to continue exploring use of probability distributions*"[12] provides no solid deliverables in a three year plan and virtually guarantees that SCE will be no further along in providing probabilities in 2028 than it is now.

As noted in MGRA's comments, SCE's IWMS model has a number of benefits that compensate for biases and errors that MGRA has long noted in its comments on the SCE model. However, it is not a "risk model" in the formal term. It is a heuristic system used to identify certain classes of infrastructure where risks are elevated. It's weaknesses are also listed, and these would be resolved by incorporation into a legitimate probabilistic model.

OEIS language must be more highly prescriptive if it wants any result on a probabilistic at all:

"**SCE must provide a working plan to integrate its IWMS model into a probabilistic framework and present this plan in the 2026-2028 WMP, and implement the plan throughout the 2027 to 2028 updates**."

3.2. SCE-23B-03. PSPS and Wildfire Risk Trade-Off Transparency

In Energy Safety's evaluation of SCE's PSPS risk and Wildfire Risk Tradeoff, it determined that "*SCE demonstrated that PSPS risk has minimal impact on its overall wildfire risk and that SCE focuses on specific risks at a given location, with PSPS risk as small portion of that consideration, but not one that precludes mitigating for wildfire risk. Given SCE's justification of comparing wildfire risk to PSPS risk when undergoing mitigation planning, SCE sufficiently responded to this area for continued improvement; no further reporting is required on this area for continued improvement in SCE's 2026-2028 Base WMP.*"[13]

MGRA would like to warn OEIS that PG&E's current RAMP process (A.24-05-008) includes mandated inclusion of the Berkely ICE model to estimate costs from power shutoff. Initial

[12] DD; p. 50.
[13] DD; p. 15.

analysis of this model indicates that it increases predicted potential harm from outages by orders of magnitude, especially when industrial customers are on the circuit. MGRA has included some of the data presented by PG&E in its second pre-filing workshop as Appendix A.

The requirement to switch to the ICE model will also affect SCE within the 2026-2028 period. Energy Safety should require that in its 2026-2028 WMP SCE provide an outline of how it projects that using the ICE model with his larger potential contributions from PSPS harm will affects its planning and operations.

3.3. SCE-23B-07. Continuation of Grid Hardening Joint Studies

Among areas for continued improvement, Energy Safety finds that: "*However, many of these workstreams must continue, given ongoing developments and the importance of sharing knowledge as various utilities continue implementing mitigations, observing actual in-field effectiveness, and observing potential alternatives and new technologies to deploy.*"[14] MGRA is gratified that Energy Safety recognizes the importance of field data. However Energy Safety's areas for continued improvement as stated are unlikely to provide additional data in the next years.

MGRA has been analyzing SCE covered conductor field data for the past several years, and with each year of additional data its conclusion becomes stronger. Current data was described in MGRA comments,[15] and shows that the ignition rate for covered conductor deployed by SCE is a factor of two less than expected by SMEs and external consultants. The reason for this is not clear: outage rates and wires down rates seem to be consistent with SCE expectations, but ignitions are far less. As noted in MGRA's comments: This Is A Big Deal. One disturbing fact is that MGRA has been consistently raising this point in the last WMPs and GRC cycles, and SCE has yet to refute MGRA's results, although they are in a strong position to do so if the results are in error.

Covered conductor effectiveness is used to calculate RSEs and cost/benefit ratios for comparison to undergrounding and for deciding mitigations. While determining costs is not a core mission for OEIS, the effectiveness of mitigations is a critical input, and it is the responsibility of OEIS to ensure that the utilities are calculating these values in an accurate and uniform manner.

---

[14] DD; p. 28.
[15] MGRA Comments; pp. 19-24.

Energy Safety's guidance is therefore inadequate to bring about a tangible result in a reasonable timeframe. MGRA has shown the SCE data is available and currently can provide significant guidance and inform risk models.

3.4. SCE-23B-09. Hardening Severe Risk Areas

Energy Safety notes that SCE claimed that "*SCE compared risk reduction over 45 years for two mitigation portfolios: covered conductor, rapid earth fault current limiter (REFCL), asset inspections, and vegetation management (CC/REFCL++) versus targeted undergrounding (TUG) In its analysis, SCE assumed covered conductor can be deployed two years earlier than REFCL or TUG, with interim mitigations applied during this period. SCE stated that the analysis showed TUG has a higher risk reduction than CC/REFCL++ for over 90 percent of the Severe Risk Areas, validating SCE's selection of TUG for these sites*.
Based on this evaluation, SCE concluded that targeted undergrounding reduces more risk than a comprehensive portfolio of alternatives for Severe Risk Area"[16]

Based on these results, Energy Safety concluded that: "*SCE provided adequate details on how it selects its undergrounding projects, with sufficient analysis demonstrating various portfolios of mitigations in comparison to undergrounding.*

Given that, SCE sufficiently responded to this area for continued improvement; no further reporting is required on this area for continued improvement in SCE's 2026-2028 Base WMP."[17]

Given that this result depends on an accurate estimate of risk reduction for all mitigations, Energy Safety makes an incorrect decision. If as noted in the previous section, covered conductor is much more effective at ignition reduction than SCE claims it is, then the results claimed by SCE are not correct, as shown in Table 12 of MGRA's WMP Comments.[18]

MGRA presented an analysis it performed for SCE's GRC proceeding in its WMP comments. This analysis compared a scaled back version of SCE's undergrounding program, but

[16] DD; p. 24.
[17] Id.
[18] MGRA WMP Comments; p. 53.

also included the option of continuing SCE's covered conductor program, which would allow SCE to harden all of its infrastructure in its HFRA by 2028.[19]

It is also important to note that in D.24-05-008, Commission has determined that SCE's prioritization process is not valid because it does not take into account probability. Taking these factors into account it is likely that SCE will be making significant modifications to its hardening plans over the next years, so it's highly inappropriate for energy safety to find that no further reporting is required. Energy Safety's Evaluation should be changed to read "***SCE should continue to report on this area if any of its estimates change for efficiencies or prioritization due to further required analysis on its part or due to regulatory mandated changes***".

3.5. 11.1 Risk Methodology and Assessment. SCE-25U-01. Calculating Risk Scores Using Maximum Consequence Values

As noted above, and in Energy Safety's treatment, SCE's will need to update its risk models based upon D.24-05-008.

Also add: "***Update risk models based upon ignition efficiencies informed by field data***

4. CONCLUSION

MGRA has always held Energy Safety and its work in high regard, but does not consider the current review up to OEIS's previously high standards. MGRA urges Energy Safety to undertake additional analysis and review in active and sensitive areas to ensure that critical areas are addressed in the upcoming 2026-2028 Wildfire Mitigation Plans. MGRA also respectfully requests that OEIS make the additional changes that MGRA has suggested in the technical sections.

[19] Id; pp. 39-42.

Respectfully submitted this 11th day of September, 2024,

By: __/S/___ ***Joseph W. Mitchell, Ph.D.***_____

Joseph W. Mitchell
M-bar Technologies and Consulting, LLC
19412 Kimball Valley Rd.
Ramona, CA 92065
(858) 228-0089
jwmitchell@mbartek.com
on behalf of the Mussey Grade Road Alliance

Attachment A: *Selected pages from:*
PG&E 2024 Risk Assessment and Mitigation Phase Workshop #2:
Cost-Benefit Approach Demonstration; April 11, 2024

PG&E 2024 Risk Assessment and Mitigation Phase Workshop #2: Cost-Benefit Approach Demonstration

April 11, 2024

Principle 5 – Monetized Levels of Attributes

Element Description and Requirements

RDF Element No. 6: *"Apply a monetized value to the Levels of each of the Attributes using a standard set of parameters or formulas, from other government agencies or industry sources, as determined by the Phase II Decision Adopting Modifications to the Risk-Based Decision-Making Framework Adopted in D.18-12-014 and Directing Environmental and Social Justice Pilots in Rulemaking (R.) 20-07-013.*

A utility may deviate from the agreed upon standard set of parameters or formulas by submitting a detailed explanation as to why the use of a different value would be more appropriate. The use of a different set of parameters or formulas to determine the Monetized Levels of Attributes requires an analysis comparing the results of its "equivalent or better" set of parameters or formulas against the results of the agreed upon standard set of parameters or formulas."

PG&E adopted the following Monetized Attribute values based on the requirements outlined in D.22-12-027.

Safety

Calculated using the Department of Transportation (DOT) guidance for the Value of a Statistical Life (VSL), adjusted for: 1) California price and real wage data, and 2) the base year of the RAMP filing.

2023 CA-Adjusted VSL:
$15.23 million (1,2)

Electric Reliability

Calculated using the Lawrence Berkeley National Laboratory (LBNL) Interruption Cost Estimate (ICE) Calculator, updated with PG&E-specific information.

Expressed in dollars per customer-minute interrupted.

2023 $/CMI
$3.17 (3)

Gas Reliability

For gas reliability, the Risk OIR Phase II Decision directs IOUs to use the implied dollar value from their most recent RAMP MAVF risk score calculations.

The implied gas reliability value expressed in dollars per customer impacted:

2023 $/Customer:
$1,569.75 (4)

Notes to Results:

1. $2023 VSL calculated by adjusting the $2012 DOT VSL using inflation (CPI) and real wage growth data from the Bureau of Labor Statistics (BLS), per DOT guidance.
2. $2023 California-adjusted VSL calculated by applying price and income modifiers derived from CPI and weekly earning data from the BLS and California Department of Industrial Relations
3. PG&E used PG&E-specific data in the ICE Calculator such as customer class composition and annual energy usage, C&I industry percentages, temporal outage distribution and average interruption frequency. ICE Calculator year 2016 results were adjusted to $2023 using BLS CPI data.
4. $2023 Gas Reliability value calculated by adjusting the 2020 MAVF-implied values, which is in 2020 dollars, using BLS CPI data.

Overview of ICE Calculation Used for Reliability Attribute

Note: This shows an initial screen shot of the ICE calculator *prior to* applying PG&E's User Inputs.

ICE Calculator User Inputs (highlighted in yellow)

Reliability Inputs:

SAIFI	2.000
SAIDI	120.0
CAIDI	60.0

Number of Customers:

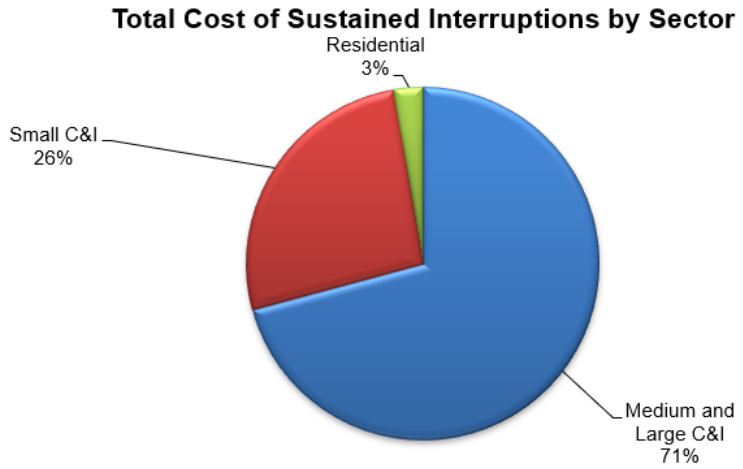
Non-Residential	1,000
Residential	10,000

Choose state/states:

State 1	California

Main Output:

Sector	No. of Customers	Cost Per Event (2016$)	Cost Per Average kW (2016$)	Cost Per Unserved kWh (2016$)	Total Cost of Sustained Interruptions (2016$)
Medium and Large C&I	169	$8,444.8	$161.2	$161.2	$2,854,333.0
Small C&I	831	$643.6	$311.5	$311.5	$1,069,733.4
Residential	10,000	$5.3	$6.5	$6.5	$106,819.7
All Customers	11,000	$183.2	$107.3	$107.3	$4,030,886.1



PG&E used the ICE Calculator spreadsheet tool, 2018 update, found on the ICE Calculator documentation page

RDF Requirement regarding ICE Calculator

The RDF Proceeding Phase II Decision requires each IOU to use the most current version of the ICE Calculator to determine a standard dollar valuation of Electric Reliability risk for the Reliability Attribute.

ICE Calculator Overview

The Interruption Cost Estimate (ICE) Calculator is a tool designed for electric reliability planners at utilities, government organizations or other entities that are interested in estimating interruption costs and/or the benefits associated with reliability improvements.

What Interruption Cost Means

Interruption Costs refer to value of electric service reliability estimates developed through either surveys of the economic losses customers experience because of electric service interruptions or customers' willingness-to-pay to avoid/willingness-to-accept compensation for such problems.

PG&E's Electric Reliability Risk Valuation

The natural unit of PG&E's electric reliability attribute is customer minutes interrupted (CMI) per event, however Cost per CMI is not a standard output. Thus, PG&E computes it by dividing ❶[Cost per Event] by ❷[SAIDI] after setting [SAIFI] as 1 and [Number of Customers] as total number of customers.

PG&E Inputs Used in ICE Calculator

PG&E used PG&E-specific data in the ICE Calculator to arrive at $3.17/CMI.

	ICE Calculator Input Variable	User Input Default	PG&E Data	PG&E Data Source
Number of Customers	Non-Residential Residential	1,000 10,000	**633,547** **4,961,426**	2023 recorded accounts data from PG&E's Rate Design and Analytics Department
Number of Accounts by Rate Class	Residential Small C&I Medium and Large C&I	12,971,924 1,567,550 319,434	**4,961,426** **469,588** **163,960**	2023 recorded accounts data from PG&E's Rate Design and Analytics Department
Annual Usage per Customer (MWh)	Residential Small C&I Medium and Large C&I	7.2 18.1 459.0	**5.1** **15.3** **240.6**	2023 recorded usage data from PG&E's Rate Design and Analytics Department
Medium and Large Commercial and Industrial (C&I) Customer Mix	~~Construction~~ Manufacturing ~~All Other Industries~~	~~2.0%~~ 17.1% ~~80.9%~~	~~**2.0%**~~ **9.5%** ~~**88.5%**~~	2023 recorded accounts data from PG&E's Rate Design and Analytics Department
Small C&I Customer Mix	~~Small C&I~~ ~~Construction~~ Manufacturing ~~All Other Industries~~	~~9.5%~~ 5.0% ~~85.5%~~	~~**9.5%**~~ **7.1%** ~~**83.4%**~~	2023 recorded accounts data from PG&E's Rate Design and Analytics Department
Reliability Inputs	SAIFI SAIDI CAIDI	2.00 120.00 60.00	**1.00** **120.00** **120.00**	~~Recorded annual average data from 2013-2022~~
Outages by Time of Day	Morning (6 am to 12 pm) Afternoon (12 pm to 5 pm) Evening (5 pm to 10 pm) Night (10 pm to 6 am)	25% 21% 21% 33%	**13%** **23%** **28%** **36%**	Electric Operations unplanned outage data from 2016-2023
Outages by Time of Year	Summer (June through September) Non-Summer (October through May)	50% 50%	**29%** **71%**	Electric Operations unplanned outage data from 2016-2023

PG&E's Electric Reliability Attribute Risk Valuation

PG&E Plans to Use the Weighted Average Value of Electric Reliability from ICE for its 2024 RAMP.

- Large disparities in Values between C&I and Residential Customers could lead to significant, unintended consequences.
- PG&E will review the policy of using the Average pending the ICE 2.0 update.
- PG&E expresses the Monetized Electric Reliability Attribute as Cost per Customer Minutes Interrupted ($/CMI), shown below in $2023.

$$\frac{\boldsymbol{Cost}}{\boldsymbol{CMI}} = \frac{Cost\ Per\ Event}{SAIDI} = \frac{Cost\ Per\ Event \times Total\ No.of\ Customers}{Sum\ of\ All\ Customer\ Interruption\ Durations}$$

ICE Model Outputs				
	ICE User Input Default		PG&E Data	
Sector	Cost per CMI (2016$)	**Cost per CMI ($2023)**	Cost per CMI (2016$)	**Cost per CMI ($2023)**
Medium and Large C&I	$70.37	$89.34	$61.35	$77.89
Small C&I	$5.36	$6.81	$7.87	$9.99
Residential	$0.04	$0.06	$0.04	$0.06
All Customers	**$1.53**	**$1.94**	**$2.50**	**$3.17**

- To compute Electric Reliability Attribute Risk Values in its risk models, PG&E is using the $3.17/CMI for all customer classes.
- The resulting Electric Reliability Risk Values are approximately 63% higher with PG&E's User Inputs, compared to $1.94/CMI from the default User Input.

Note: PG&E adjusted ICE Calculator year 2016 results to $2023 using BLS CPI data, available at https://data.bls.gov/timeseries/CUUR0000SA0 .