CPUC Docket: A.23-12-001
Witness: Borden
Exhibit: TURN-01-E

PREPARED TESTIMONY OF ERIC BORDEN

ADDRESSING PACIFIC GAS AND ELECTRIC COMPANY'S 2023 WILDFIRE MITIGATION AND CATASTROPHIC EVENT EXPENDITURE REQUEST REGARDING ENHANCED VEGETATION MANAGEMENT

Submitted on Behalf of

THE UTILITY REFORM NETWORK

360 Grand Ave, #150
Oakland, CA 94610

Telephone: (415) 929-8876
Facsimile: (415) 912-1422

November 1, 2024

Errata February 7, 2025

TABLE OF CONTENTS

I. INTRODUCTION AND OVERVIEW OF RECOMMENDATIONS 1

II. PG&E'S UNPRECEDENTED USE OF MEMORANDUM AND BALANCING ACCOUNTS TO RECORD OVERSPENDING HAS DECIMATED FORECAST RATEMAKING 3

III. EVM COST OVERRUNS WERE NOT REASONABLY INCURRED AND SHOULD BE DISALLOWED 5

A. PG&E Exercised Poor Fiscal Management and Improper Judgement in its Administration of the 2022 EVM Program 7

B. PG&E Should Have, But Did Not, Adequately Consider the Paltry Risk Reduction Benefits of EVM, Particularly in Contrast to the Massive Program Costs 9

C. PG&E's EVM Program Did Not Actually Prioritize the Highest Risk Miles 14

IV. RECOMMENDATIONS AND CONCLUSIONS 21

I. INTRODUCTION AND OVERVIEW OF RECOMMENDATIONS[1, 2]

Pacific Gas and Electric Company's (PG&E's) use of memorandum and balancing accounts to record above-authorized expenditures has risen to unprecedented levels, and should be carefully scrutinized, as this spending will significantly impact the affordability of electric rates if adopted. While the utility may point to a host of reasons why it spent over authorized budgets, it is the utility's burden to show that its spending was *reasonable* given the circumstances at the time.

This testimony focuses on Enhanced Vegetation Management (EVM) costs. PG&E overspent its EVM forecast by 112 percent, though only a portion of this overspending may be reviewed by the Commission due to a 20 percent "buffer" that is automatically deemed reasonable and charged to ratepayers. This is shown in Table 1 below.

Table 1. 2022 authorized versus recorded enhanced vegetation management costs ($ Thousands)

	Authorized	Recorded	Percent Overspend	Dollar Overspend	Subject to Review
EVM	$385,679	$816,978	112%	$431,299	$353,389

Source/Note: TURN-2, question 6, attachment 1. This also includes certain adjustments from Ernst and Young. Recorded amount differs from PG&E Testimony, Table 3-1, p. 3-3.

TURN's analysis of PG&E's application, discussed further in the ensuing sections, finds that PG&E set out to accomplish its program regardless of its low to non-existent efficacy at reducing

[1] This testimony is sponsored by Eric Borden from Synapse Energy Economics. His resume and a summary of previous testimonies is provided Appendix A to this testimony.

[2] This errata incorporates information provided by PG&E on February 5, 2025, as a supplement to PG&E's previous response to TURN-2, question 1, which requested that PG&E identify Circuit Protection Zones (CPZs) that had EVM work done previous to 2022. PG&E clarified on February 5, 2025, that its original response included tree work completed through 2020 instead of 2021. PG&E's supplemental response acknowledges this "oversight" and refers TURN to data provided in response to TURN-8, question 3 on February 3, 2025 that incorporates tree work completed through 2021. TURN has updated its analysis of PG&E's risk prioritization in Section III.C to accurately account for prior EVM tree work. This errata also incorporates additional information provided by PG&E on February 5, 2025 in response to TURN-8, question 1 regarding PG&E's internal cost controls and budget change approval processes. Finally, this errata corrects the inadvertent omission of page numbers.

risk and extremely high cost. All costs subject to review should be disallowed, based on the following findings and conclusions:

- PG&E does not demonstrate the reasonableness of its $430 million in overspending, $353 million of which is being review here.
    - PG&E imprudently managed the EVM program in 2022.
        - The utility knew by February 2022 that it would end the EVM program due to the presence of more cost-effective alternatives, yet spent well over the CPUC-authorized budget over the course of the rest of the year.
        - PG&E had extremely minimal cost controls or internal approval processes to determine whether it was reasonable to exceed the CPUC authorized budget. [3]
    - PG&E did not adequately consider the risk reduction of its program, particularly relative to its imposition of massive costs and resources.
        - PG&E's 2023 General Rate Case (GRC) filing in June 2021 showed EVM was one of the least cost-effective programs available to reduce wildfire risk. Actual cost-effectiveness of the program was about 32 percent lower than PG&E's estimate.
        - Internal analyses conducted by PG&E in August 2022 showed EVM was ineffective at reducing ignition risk. Yet the utility went on to spend $249 million after this study.
            - Other analyses by the utility indicate, at best, EVM reduced risk by **0.60 percent.** This should have caused PG&E to re-evaluate its approach as quickly as possible.
        - PG&E's program did not actually target the highest-risk miles based on its own methodology, despite claims to the contrary.

[3] DR response TURN-2, question 17(a), states "There were no internal management approvals for the EVM program in 2022." However, there appear to be instances where PG&E management was informed of cost overruns, or budget reprioritizations occurred (see DR response TURN-8, question 1).

II. PG&E'S UNPRECEDENTED USE OF MEMORANDUM AND BALANCING ACCOUNTS TO RECORD OVERSPENDING HAS DECIMATED FORECAST RATEMAKING

One of the primary tools used in California to economically regulate utilities is forecast ratemaking. In General Rate Cases (GRCs), a utility forecasts the majority of annual costs at a granular level, and these forecasts are scrutinized by parties and the Commission; ultimately, a revenue requirement deemed just and reasonable for the utility operations subject to the GRC is adopted by the Commission for the "test year" and, with attrition adjustments, for each of the three years that follow. Once the GRC-authorized revenue requirement is set, the utility has an economic incentive to stay within the budget adopted by the Commission, as any overspend generally reduces its profit; on the other hand, if the utility spends less than authorized, it may retain the difference as shareholder return.

Memorandum and balancing accounts, which I do not dispute are necessary in some circumstances, erode or eliminate the traditional cost management incentives provided by forecast ratemaking for cost categories that are included in utility GRC forecasts. Traditionally, these accounts have been used only for costs that are more clearly outside of the control of the utility, and may not be forecast or authorized at all on a prospective basis, such as the Catastrophic Event Memorandum Account that permits recorded costs of responding to natural disasters. This is <u>not</u> the case for much of the costs included in wildfire mitigation memorandum and balancing accounts, including but not limited to vegetation management. Rather than adhere to the amounts deemed reasonable by the Commission in a GRC decision,. PG&E appears to be making a habit of largely if not completely ignoring authorized GRC forecasts due to the fact that it can record cost overruns in a memorandum or balancing account.

In just the last four years, PG&E has requested recovery of over *$6.4 billion* in wildfire mitigation-related electric expenditures in four "WMCE" applications plus Application (A.) 23-06-008, as shown below. This amount is just the portion of spending over the *additional* 20 percent of the GRC-authorized amount that D.20-12-005 permitted PG&E to recover without a reasonableness review, so actual above-authorized expenditures are even larger. To

the extent authorized for rate recovery, these WMCE-related increases will come on top of increases adopted in utility GRCs and other individual applications.

Table 2. Summary of Wildfire Mitigation Requested Costs ($ Thousands, Electric Only)

	FHPMA	WMPMA	FRRMA	WMBA	VMBA	Total
2020 WMCE	$291,557	$1,311,324				$1,602,881
2021 WMCE				$149,469	$591,718	$741,187
2022 WMCE				$101,457	$814,724	$916,181
A.23-06-008		$2,094,542	$165,403			$2,259,945
2023 WMCE				$76,384	$833,496	$909,880
Total	**$291,557**	**$3,405,866**		**$327,310**	**$2,239,938**	**$6,430,074**

Source: A.20-09-019 (2020 WMCE), Application, p. 8, Table 3; A.21-09-008 (2021 WMCE), Application, p. 14, Table 2; A.22-12-009 (2022 WMCE), Application, p. 12, Table 1; A.23-06-008, Application, p. 24, Table 1; A.23-12-001 (2023 WMCE), Application, p. 14, Table 1.

The level of spending by PG&E in excess of GRC authorized forecasts shown here is incontrovertible evidence that there is a problem with the current approach, particularly PG&E's reliance on balancing and memorandum accounts to support overspending on wildfire mitigation activities, including vegetation management. Whatever accommodation memorandum and balancing accounts were intended to provide for the potential for some degree of above-authorized spending in wildfire mitigation programs, PG&E's recorded figures raise serious questions about PG&E's willingness to prudently manage these programs to keep spending to the lowest reasonable level. The Commission must revisit and revise the practices that give PG&E the ability to record an unlimited amount of cost overruns and seek recovery from ratepayers.[4] I recommend that the Commission initiate an investigation into alternative approaches that would better balance the goals of currently-adopted ratemaking with the need to achieve affordable rates in California.[5]

[4] The Commission in D.23-11-069 modified PG&E's WMBA and VMBA for the Test Year 2023 GRC cycle, making them both one-way balancing accounts. D.23-11-069, pp. 486 (WMBA), 488 (VMBA). PG&E still has memorandum accounts for wildfire mitigation spending.

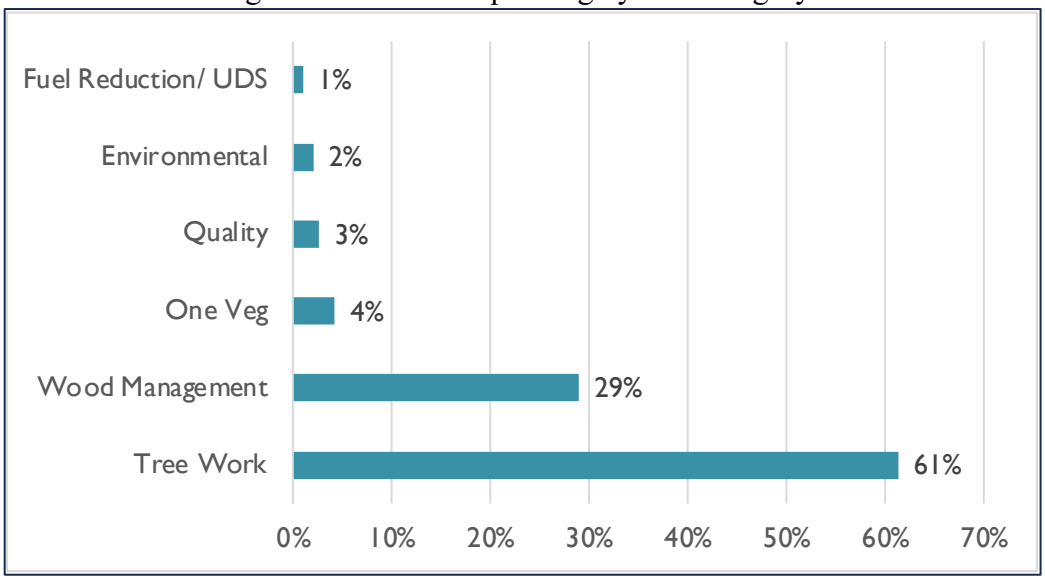
[5] I envision an Order Instituting Investigation (OII) which could apply to all Investor Owned Utilities. This same recommendation was made in my prior testimony in A.22-12-009, Ex. TURN-01, p. 4.

III. EVM COST OVERRUNS WERE NOT REASONABLY INCURRED AND SHOULD BE DISALLOWED

In 2022, PG&E overspent the $386 million it was authorized for the EVM program by 112 percent ($431 million) for a total expenditure of $817 million; $353 million of this amount is under review in this application.

This overspending was primarily (90 percent) due to additional "tree work" – tree trimming and tree removals – and "wood management," which involves relocation and/or cutting wood after tree removal on customers' property, at the request of the property owner.[6] PG&E's testimony states "[t]he recorded 2022 data indicates that the ratio of trees removed to trees trimmed was significantly higher than forecasted."[7]

Figure 1. EVM overspending by cost category[8]



Source: TURN-2, question 6, attachment 1.

[6] PG&E Testimony, p. 3-23.
[7] PG&E Testimony, p. 3-25.
[8] Does not factor in reductions from authorized amounts in order to show percentage by cost category.

The overspending on tree work was almost exclusively due to greater than anticipated tree removals, as opposed to trimming. Indeed, PG&E removed 346,535 trees in 2022, compared with its forecast of 21,915.[9] This is a difference of 324,620 trees, or 1,481 percent.

PG&E states that this increase in tree removals was due to a shift in focus of the EVM program from tree species to prioritizing work by risk. According to PG&E, higher risk areas have higher tree density (and therefore require more tree work).[10] PG&E's increased focus on the highest risk miles was part of an enhanced oversight process initiated by the Commission when PG&E was inadequately prioritizing risk in its program. Due to this effort, PG&E claims that "98.7 percent of…EVM work performed was on the highest 20 percent risk-ranked CPZ miles."[11] This claim is addressed below.

Wood management work and cost increases were a result of increased EVM work overall whereby "PG&E offered wood management as a means of reducing the potential burden on customers caused by the resulting wood.[12] Further, customers were more aware than previously about PG&E's program to remove wood and related debris from their property.[13]

PG&E also overspent on safety, environmental costs, and information technology (IT) costs. Additional safety costs were incurred due to transitioning contract employees to internal, and other reasons.[14] It is not clear why the utility needed to overspend in this category. It is also not clear why PG&E overspent on environmental costs, as PG&E merely asserts the fact of overspending without explaining why.[15] Additional IT costs were incurred to create a "One VM" tool, which helped to track work in the field. This cost was not forecast in the utility's 2020

[9] TURN-2, question 6, attachment 1.
[10] PG&E Testimony, pp. 3-20 to 3-21.
[11] PG&E Testimony, p. 3-29. CPZ stands for circuit protection zones.
[12] PG&E Testimony, p. 3-27.
[13] PG&E Testimony, p. 3-27.
[14] PG&E Testimony, p. 3-27.
[15] PG&E Testimony, p. 3-28.

GRC.[16] Additional costs were incurred in other categories, but were offset by underspending on LIDAR.[17]

A. PG&E Exercised Poor Fiscal Management and Improper Judgement in its Administration of the 2022 EVM Program

A primary question for the Commission to consider regarding the reasonableness of PG&E's overspending is the judgement PG&E employed in 2022 when it overspent the CPUC authorized EVM budget by 112 percent. In 2022, there were multiple instances where PG&E should have course corrected to significantly curtail if not eliminate the program to responsibly manage what it now believes should be a ratepayer-funded program; instead, PG&E showed an utter lack of fiscal responsibility and prudent management. PG&E committed to the program, and regardless of evidence of efficacy to reduce wildfire risk during risky wildfire conditions, or better use of resources, it would implement the program at any cost.

There are several important facts to consider in assessing the reasonableness of PG&E's decision-making for the EVM program:

1. PG&E knew by **February 2022** that it would effectively end the EVM program in light of more cost-effective alternatives, starting in 2023 (discussed further below).[18] Yet between March and December of that year PG&E would go on to spend $715 million on EVM.[19]

2. PG&E had extremely minimal cost controls or internal approval processes to determine whether it was reasonable to exceed the CPUC authorized budget.[20] While budget overruns were consistently "monitored," there was not even a "rubber stamp" process

[16] PG&E Testimony, pp. 3-28 to 3-29.
[17] PG&E Testimony, p. 3-29.
[18] A.21-06-021, PG&E 2023 GRC, PG&E February 25, 2022 Errata and Supplemental Testimony: PG&E-4 Vol. 1, pp. 3-2, 3-7, 4.6-2; PG&E-4, Vol. 2, pp. 9-3, 9-9.
[19] TURN-2, question 13, attachment 1.
[20] DR response TURN-2, question 17(a), states "There were no internal management approvals for the EVM program in 2022." However there appear to be instances where PG&E management was informed of cost overruns, or budget reprioritizations occurred (see DR response TURN-8, question 1).

from executive leadership for EVM program overspending. The costs were simply recorded, and PG&E would prefer they be passed on to ratepayers.[21]

3. PG&E never intended to meet either the CPUC authorized budget of $385.7 million or 120 percent of that budget, $462.8 million; PG&E's initial target was $597 million, which was increased to $621 million.[22] There appears to have been no consideration of whether it was *reasonable* to spend $817 million on a program that was expected to end and for which efficacy was highly questionable.

Regarding the first point, PG&E stated in February 2022 that it would significantly modify the EVM program due to the emergence of EPSS (Enhanced Power Safety Settings) which the utility began implementing in 2021. PG&E found this program provided an 80 percent risk reduction at a fraction of the cost compared with EVM.[23] A reasonable manager of a program, particularly one as expensive as EVM, would re-assess 2022 EVM implementation at the time when it knew there were more effective alternatives, including EPSS; PG&E did not.

In response to a TURN data request, PG&E suggests that it was "necessary" to continue implementing its EVM program throughout 2022 in accordance with its Wildfire Mitigation Plan and points to Commission Resolution M-4864, which authorized PG&E to exit Step 1 of the Commission's "Enhanced Oversight and Enforcement Process" adopted for PG&E in D.20-05-053.[24] The extent to which PG&E's Wildfire Mitigation Plan and Resolution M-4864 constrained PG&E's ability to modify the EVM program in response to new information about the program's effectiveness and relative value among the suite of wildfire mitigation options is a legal issue. TURN does not address this legal issue here in TURN's policy testimony. TURN will address this legal issue in briefing as part of demonstrating that PG&E's management of the

[21] TURN-2, question 17(a).
[22] TURN-2, question 17(b); PG&E Testimony, p. 3-20, Table 3-5 (EMV authorized amounts)
[23] A.21-06-021, PG&E 2023 GRC, PG&E February 25, 2022 Update Testimony, p. 3-7.
[24] TURN 2, question 18.

EVM program in 2022 resulted in unreasonable costs that should not be recovered from ratepayers.

B. PG&E Should Have, But Did Not, Adequately Consider the Paltry Risk Reduction Benefits of EVM, Particularly in Contrast to the Massive Program Costs

PG&E's position in this case is, essentially, that it was going to implement its EVM program at any cost, regardless of a dearth of evidence the program was an effective use of resources. The Commission must recognize that virtually *all* activities that a utility engages in related to overhead power lines have some connection to wildfire risk. PG&E's decision to implement its program regardless of the cost is simply not a reasonable business practice. If competition for electricity service were allowed, customers and investors would flock to a utility with cheaper rates because it had implemented wildfire mitigation strategies that were more cost-effective. The fact that PG&E recorded costs for wildfire-related activities is not sufficient rationale for these costs to be collected from ratepayers. The reasoning for overspending should include documentation of ratepayer benefits – in this case wildfire risk reduction due to the activities of the program. I agree with the following statement by Wildfire Safety Division (WSD), now the Office of Energy Infrastructure Safety (OEIS), in 2020:

> The effectiveness of wildfire mitigation activities contained in electrical corporations' WMPs cannot be determined using "program targets," e.g., number of miles of covered conductor installed or number of trees trimmed.[25]

Similarly, the number of EVM tree removals and completed line miles relative to program targets do not establish program effectiveness. Yet PG&E's explanation for its massive level of overspending on EVM includes no discussion of the risk reduction or effectiveness of the EVM overspending.

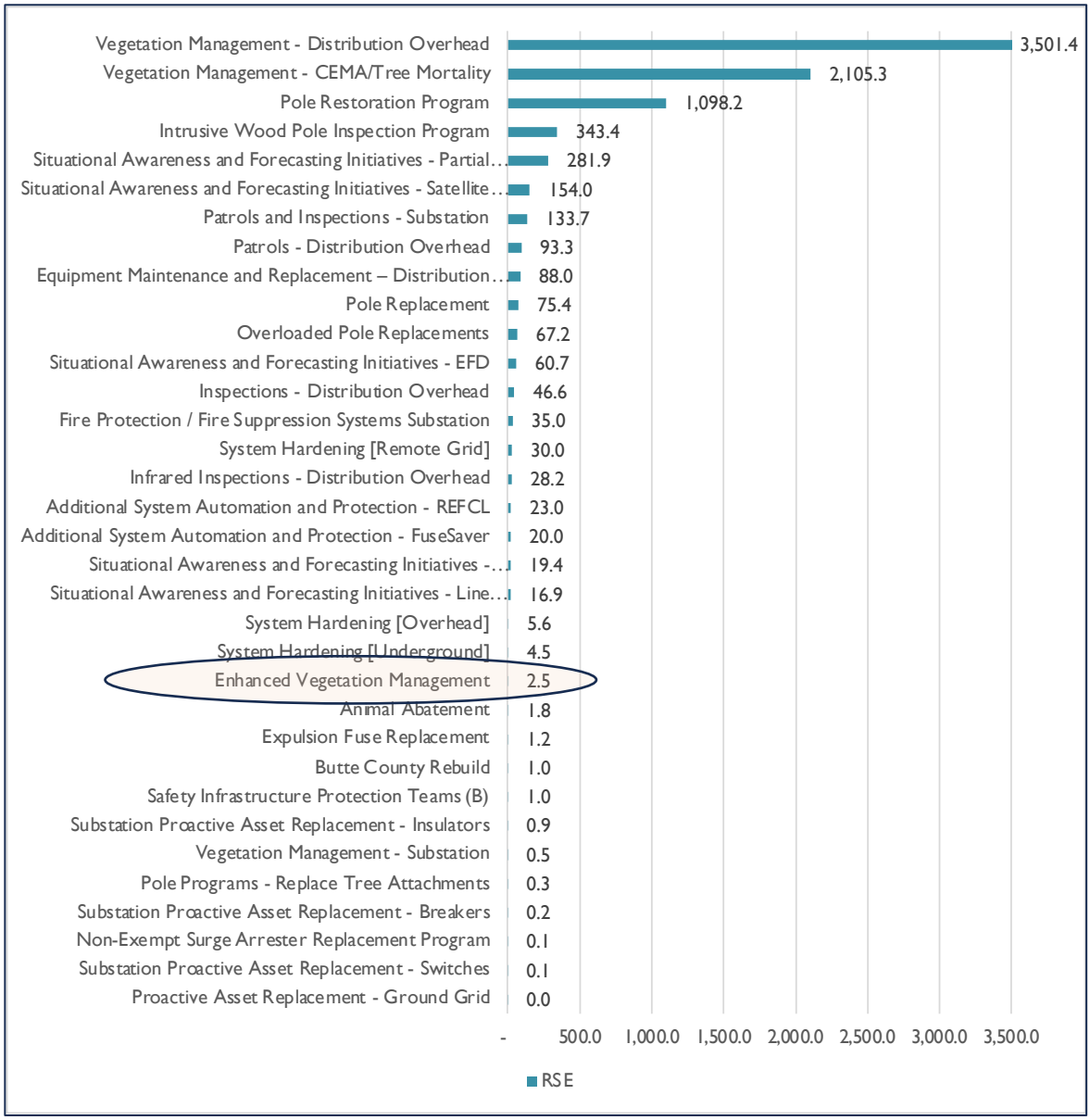
What *was* known during the time PG&E spent $817 million was that the program was expected to be an extremely poor use of ratepayer funds to achieve wildfire risk reduction. First, when

[25] 2020 WMP Decision, p. 42.

PG&E filed its 2023 GRC in the middle of 2021, the risk spend efficiency (RSE) – or cost-effectiveness – of EVM was one of the lowest of all its wildfire-related programs. This means the Company *knew,* that relative to each dollar spent on EVM little risk reduction could be achieved when compared with almost all other initiatives. On the other hand, by far the most cost-effective program was traditional vegetation management, which TURN's testimony in the prior GRC had strenuously argued should be the priority for PG&E rather than EVM.[26]

[26] A.18-12-009, Ex. TURN-1, Eric Borden Testimony on behalf of TURN, p. 14, stated in part "PG&E must do a better job of identifying and removing unhealthy trees, while removing only those healthy trees which truly pose a danger to power lines during dry, hot, windy conditions."

Figure 2. PG&E RSE Results, 2023-2026, from TY 2023 GRC filed in June 2021



Source: A.21-06-021, June 2021 GRC Filing workpapers, EO-WLDFR-3_RSE Input File, tab "RSE Results."

Note that since PG&E's program was much more expensive than anticipated, even this low RSE was overstated compared with actual spending. The actual cost-effectiveness of the program was

about 32 percent lower than anticipated, using figures from PG&E's 2020 RAMP that PG&E provided when asked to estimate the risk reduction achieved by EVM in 2022.[27]

Further, PG&E's internal analyses were not able to show that EVM meaningfully reduces risk, despite PG&E spending billions of dollars on the program since 2019. For example, in August 2022, PG&E conducted an analysis which found that any reduction to wildfire risk due to EVM was statistically insignificant: specifically, EVM failed to reduce ignitions, outages, and tree failures in a statistically significant way.[28] This did not cause PG&E any pause. After August 2022, PG&E would go on to spend $249 million from September to December.[29] Additionally, the utility knew in *February* 2022 that it would end the EVM program due in part to the presence of more cost-effective alternatives. This is discussed above.

To my knowledge, the only instance for which PG&E has determined any efficacy of the EVM program was a finding in August 2022 that EVM is 7 percent effective at reducing ignitions during *non*-risky "blue sky" conditions as well as "low snow" conditions, which is not relevant to wildfire risk.[30] Not only is the percentage on its own absurdly low for the high costs of the program, "blue sky" conditions are by definition times when wildfire risk is extremely low. PG&E's risk modeling from February 2022 found that 91.5 percent of wildfire risk occurs during red flag warning conditions.[31] A 7 percent mitigation effectiveness for the remaining risk (assuming, conservatively, they are all under "blue sky" conditions) means the EVM program, at best, reduces wildfire risk by **0.60** percent. This extremely low risk reduction came in

[27] TURN-2, question 14 provides risk reduction from EVM based on the 2020 RAMP methodology, applied to actual spending in 2022 but adjusted for the number of miles executed (1,924 rather than the 1,800 forecast in RAMP). These figures were used to calculate an RSE (risk reduction / cost) and compared to derive the 32 percent difference.
[28] A.22-12-009, PG&E 2022 WMCE, TURN-3, Question 1, Attachment 7.
[29] Calculated from TURN-2, question 13, attachment 1.
[30] TURN-2, question 17, attachment 2, p. 4 (which also defines "blue sky" conditions as "the best conditions" and references the August 2022 study for the 7 percent effectiveness statistic).
[31] PG&E risk workpapers from 2023 GRC, February 2022 Supplemental Testimony and Errata; EO-WLDFR-2_Bow Tie; tab "Bow Tie."

conjunction with the extraordinarily high cost of the program, negative environmental impacts, negative customer interactions, and increased worker safety risk exposure.[32]

The fact is that there has never been objective data to support the large-scale removal of living, healthy trees, purportedly the purpose of EVM. This was the case even using PG&E's original forecast for tree removal, much lower than the clear-cutting the utility accomplished in 2022. PG&E's own data demonstrated that large-scale removal of living, healthy trees was unlikely to meaningfully reduce risk. As TURN explained in testimony in PG&E's 2020 GRC:

> […] based on the data provided, approximately 4% of the 2,000 ignitions in PG&E's territory reported from June 2014-2018 can be said to be the result of healthy trees falling over; the figure is 7% for Tier 2 and 3 HFTDs. In addition, the data suggests PG&E's program is much too large when one compares the scope of the problem with PG&E's proposed solution. **Between June 2014 and 2018 there were 161 healthy and non-healthy trees that fell into powerlines in PG&E's HFTDs (Tier 2 and 3), an average of 36 trees per year. Over this period, there were 46 total incidences of healthy trees that fell into power lines in Tier 2 and 3 HFTDs, an average of about 10 per year.** By contrast, PG&E's program targets 143,000 trees per year for removal. An intelligently targeted program to remove only the riskiest trees could dramatically reduce costs and environmental harm, saving both ratepayers and the environment while effectively mitigating the risk posed by tall trees outside of the utility right of way.[33]

The program has gone on to impose massive resource and financial costs, beyond what the Commission approved, in addition to the environmental degradation associated with tree removal.[34]

---

[32] TURN-2, question 17, attachment 2, p. 4. See also Sacramento Bee, *PG&E is aggressively cutting trees across California. This woodsy town is fighting back,* October 2020. Available: https://www.sacbee.com/news/california/fires/article246108245.html. A quote from this article is revealing about what was seen as the drivers of program implementation. "Above all, they say the utility — after being driven into bankruptcy by the billions of dollars in claims generated by the 2017 and 2018 wildfires — is going overboard in its desire to eliminate potentially hazardous trees. **'They're clear-cutting,'** said Tom Dykstra, a Nevada City retiree who has six trees targeted for removal. "It seems like it's an over-reach to cut them all down." Emphasis added.

[33] Emphasis added. A.18-12-009, PG&E 2020 GRC, TURN-1, Eric Borden Testimony on behalf of TURN, p. 13, July 26, 2019.

[34] TURN-2, question 17, attachment 2, p. 4.

PG&E chose not to heed its own data and would remove substantially more trees in 2022, 346,535,[35] –the largest cost driver of the EVM program and primary reason for cost overruns.

C. PG&E's EVM Program Did Not Actually Prioritize the Highest Risk Miles

In addition to the lack of evidence that the EVM program was a reasonable use of ratepayer funds, PG&E's claims regarding its strict adherence to the highest risk miles is both misleading and inaccurate. Specifically, PG&E states that "98.7 percent of this EVM work performed was on the highest 20 percent risk-ranked CPZ (Circuit Protection Zone) miles."[36] It is important to understand the significance of PG&E's prioritization based on a use of "risk ranked" miles rather than prioritization based on "risk."

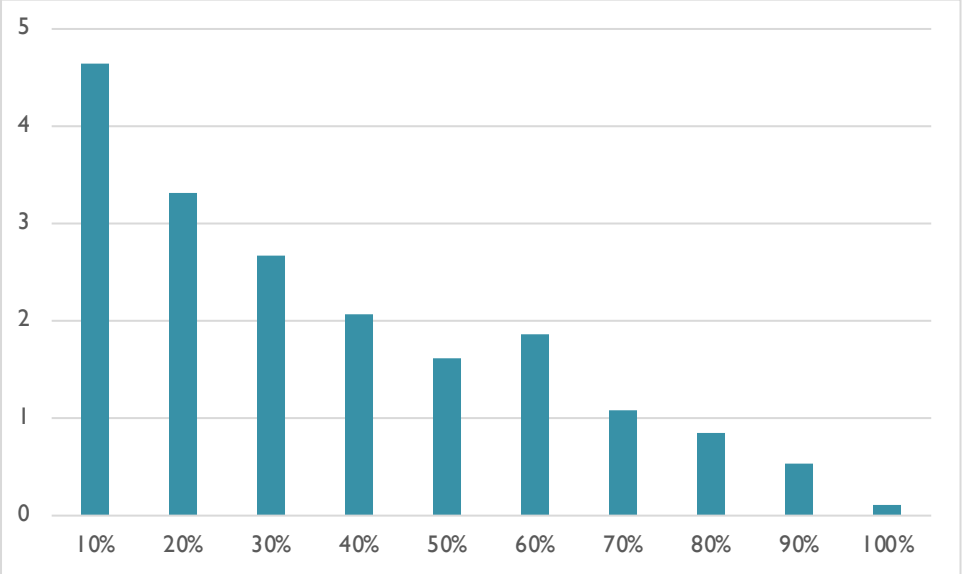
Prioritizing the top 20 percent of CPZ segments in HFTD *by risk* would require ranking the CPZs by wildfire risk (from highest to lowest) and then going down the list until the cumulative risk reached 20 percent of total risk. For example, if 4 CPZs contain 20 percent of HFTD wildfire risk, and PG&E did 98.7 percent of its work there, PG&E would have performed 98.7 percent of its work within the top 20 percent of risk. Instead of this more accurate and common-sense approach, PG&E instead ranked the segments by wildfire risk (from highest to lowest) and then identified the top 20 percent based on the total number of segments. For example, if there were 100 CPZs, PG&E's approach would say the top 20 percent of "risk" is in the top 20 segments; if there were 200 CPZs, it would be the top 40. This approach may not be directly correlated with risk because the segments targeted might cumulatively contain more or less than 20 percent of total risk, particularly if each CPZ contains a different amount of risk (which they do, shown below).[37] As TURN noted in its comments on PG&E's 2023-2025 Wildfire Mitigation Plan,[38] PG&E's definition of "high risk" is based on the *count of circuit segments*

[35] TURN-2, question 6, attachment 1.
[36] PG&E Testimony, p. 3-29.
[37] This imprecision can result in targeting work in segments where the risk reduction value proposition is low simply because those segments fall into the top 1/5 of circuits by count. As discussed below, this is exactly what happened in PG&E's EVM program in 2022.
[38] Opening Comments of The Utility Reform Network on Pacific Gas and Electric Company's 2023-2025 Wildfire Mitigation Plan, May 26, 2023, pp. 25-29.

modeled: the total number of circuit segments in the utility's HFTD is multiplied by 20% to find the threshold of "top 20 percent."

PG&E's methodology *would be* equivalent to wildfire risk if each circuit protection zone (CPZ) had the exact or at least a similar amount of risk; however, this is far from the case. The figure below shows the average risk per mile of CPZs by 10 percent risk tranche (sorted from highest to lowest). If each CPZ had the same or a similar amount of risk, each bar would be approximately the same height. However, as is often the case with risk, tree risk becomes significantly less concentrated, e.g. spread out over more miles, when CPZs are ranked from highest to lowest risk per mile.[39]

Figure 3. CPZ risk per mile by highest to lowest 10 percent risk tranche



Source: TURN-2, question 1, attachment 1, CONF; TURN-2, question 1, attachment 2, CONF.

[39] Since each CPZ contains a significantly different number of miles, "risk-based" work should sort CPZs by risk per mile. To provide an illustrative example, let's assume CPZ "A" contains 1,000 miles and has 100 units of risk; CPZ "B" is 10 miles with 20 units of risk. CPZ "B" has 2 units of risk per mile, compared with "A" which has .1 units of risk. It is a much more cost-effective use of funds to target by risk per mile. For simplicity, in my errata testimony, I provide risk-based results based on PG&E's methodology of ranking from highest to lowest absolute risk.

Clearly, risk among CPZs varies significantly across the HFTD, rendering PG&E's "count of segments" methodology inaccurate, particularly when making claims regarding what work was accomplished in the "top 20 percent." I provided an illustrative example regarding the "count of circuit" methodology in previous testimony for additional illustration of this concept and repeat it here for the Commission's convenience.[40]

[40] A.22-12-009, TURN-01, Table 5, p. 20.

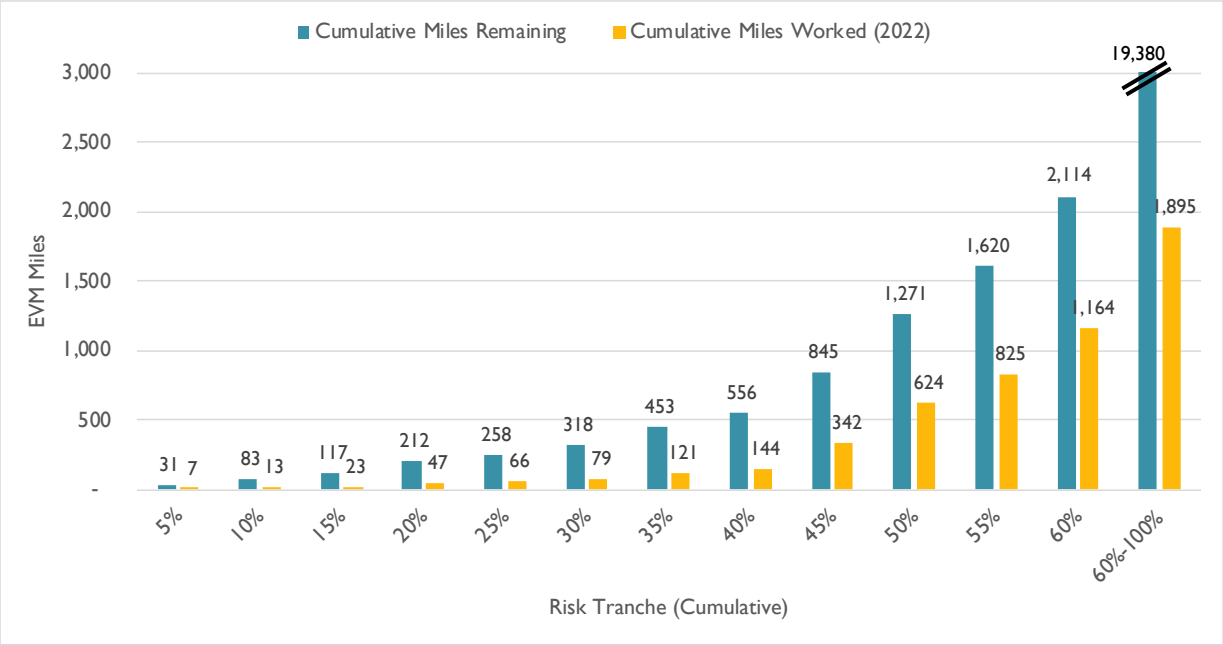
Table 3. Illustrative circuit segment (or CPZ) ranking by top 20 percent PG&E "count" methodology vs. wildfire risk methodology

	Segment Rank	WF Risk	Cumulative WF Risk	Cumulative WF Risk %
	1	25,000	25,000	10%
Top 20% - WF Risk	2	24,000	49,000	20%
	3	15,000	64,000	27%
	4	14,900	78,900	33%
	5	14,800	93,700	39%
	6	14,700	108,400	45%
	7	14,600	123,000	51%
Top 20% - PG&E	8	14,500	137,500	57%
	9	14,400	151,900	63%
	10	14,300	166,200	69%
	11	14,200	180,400	75%
	12	14,100	194,500	81%
	13	14,000	208,500	87%
	14	13,900	222,400	93%
	15	16,800	239,200	100%
	16	1	239,201	100%
	17	1	239,202	100%
	18	1	239,203	100%
	19	1	239,204	100%
	20	1	239,205	100%
	21	1	239,206	100%
	22	1	239,207	100%
	23	1	239,208	100%
	24	1	239,209	100%
	25	1	239,210	100%
	26	1	239,211	100%
	27	1	239,212	100%
	28	1	239,213	100%
	29	1	239,214	100%
	30	1	239,215	100%
	31	1	239,216	100%
	32	1	239,217	100%
	33	1	239,218	100%
	34	1	239,219	100%
	35	1	239,220	100%
	36	1	239,221	100%
	37	1	239,222	100%
	38	1	239,223	100%
	39	1	239,224	100%
	40	1	239,225	100%

This is not just a theoretical concern. The disconnect between PG&E's claim regarding the amount of work it accomplished in the "top 20 percent" of risk, versus the actual top 20 percent of risk, is stark. The figure below shows the number of cumulative miles (of the total 1,895 EVM miles) PG&E worked in the top 60 percent of risk, with circuit protection zones sorted from

highest to lowest absolute risk, versus the number of miles remaining in these CPZs which had not been previously worked under the EVM program prior to 2022.[41]

Figure 4. 2022 EVM work (miles) by risk tranche
Sorted from highest to lowest risk



Source: TURN-8, question 3, attachment 1, CONF; TURN-8, question 5, attachment 1.

The figure shows that 47 of 212 miles in the top 20 percent of risk were worked (2.4 percent of total work, compared with a maximum of 11 percent considering the number of miles that had not been worked in this top tranche).[42] Moreover, the 1,895 mile EVM program could have been completed entirely in the top 60 percent of risk; however, 731 miles, or 39 percent of the line miles, were accomplished in the bottom 40 percent of risk. At an average unit cost of about $431,170 per mile,[43] this equates to around $315 million in expenditures on miles in the bottom 40 percent of risk for the 2022 EVM program.

[41] I have removed miles PG&E labeled "out of scope" in TURN-8, question 5, attachment 1. I assume that PG&E is not requesting ratepayer funds for these miles.
[42] 212 / 1,921 = 11 percent.
[43] $816,978,059.67 / 1,895 miles = $431,170.

The table below shows the number of cumulative and incremental miles worked in 2022 compared with the miles remaining (this excludes miles worked prior to 2022), by each 5 percent risk tranche.

Table 4. Cumulative and incremental miles worked vs. miles not previously worked
Sorted from highest to lowest risk

Risk Tranche	Cumulative Miles Remaining	Cumulative Miles Worked (2022)	Incremental Miles Remaining	Incremental Miles Worked (2022)
5%	31	7	31	7
10%	83	13	51	6
15%	117	23	34	10
20%	212	47	95	24
25%	258	66	47	19
30%	318	79	60	14
35%	453	121	135	42
40%	556	144	103	23
45%	845	342	288	198
50%	1,271	624	426	281
55%	1,620	825	349	201
60%	2,114	1,164	495	339
65%	2,725	1,503	611	339
70%	3,448	1,792	722	289
75%	4,183	1,837	735	45
80%	5,095	1,846	912	9
85%	6,177	1,862	1,082	16
90%	7,630	1,893	1,453	31
95%	9,902	1,893	2,273	0
100%	19,380	1,895	9,477	2

Source: TURN-8, question 3, attachment 1, CONF; TURN-8, question 5, attachment 1.

This also demonstrates that PG&E did not accomplish work in a "1-N" fashion – meaning from highest to lowest risk – as PG&E claims in testimony.[44]

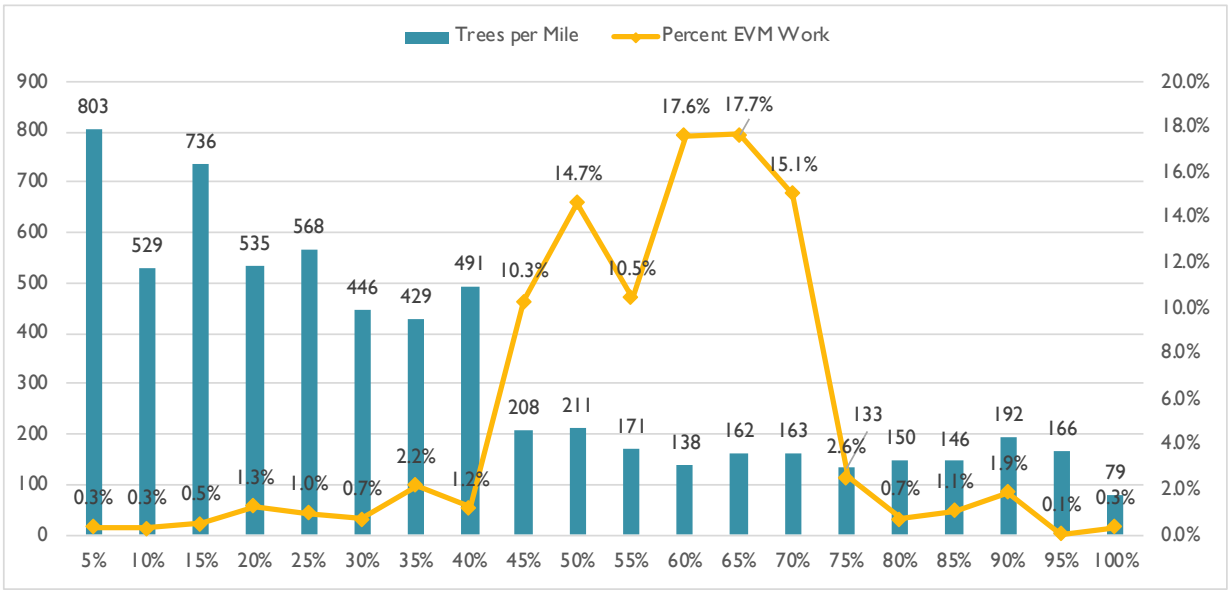
[44] PG&E Testimony, pp. 3-21; 3-26.

Not only did the EVM program provide questionable risk reduction value according to information PG&E knew at the time, PG&E did not even work the highest risk miles.

Additionally, PG&E claims that its risk prioritization led to work being done in areas with higher tree density.[45] However, PG&E clarified in discovery that the "correlation of higher tree density estimates per CPZ mile" occurs in the top 50 percent CPZ risk miles, where density "varies between ~70-80 trees per mile," compared to "~50 trees per mile for the remaining CPZ miles."[46] Moreover, considering tree density by risk tranche – as opposed to PG&E's risk-ranked miles – reveals that density is significantly higher in the top 15 percent of risk. Yet where most of the EVM work was accomplished, in the bottom 50 percent of risk, there is not a clear correlation that would indicate tree density drove additional tree work due to PG&E's "risk prioritization."

[45] PG&E testimony, p. 3-20.
[46] TURN-2, question 1(b).

Figure 5. Trees per mile by risk tranche[47]



Source: TURN-8, question 3, attachment 1, CONF.

IV. RECOMMENDATIONS AND CONCLUSIONS

PG&E's stewardship of the EVM program in 2022 was imprudent based on known facts at the time. PG&E did not put into place even basic spending safeguards throughout 2022. It knew the program delivered little risk reduction for the money spent coming well in advance of program implementation in 2022. In February 2022, PG&E did not re-evaluate the program or spending despite its plan to scale back EVM in 2023 to focus on more cost-effective measures.

PG&E's explanations of its overspending boil down to the unreasonable view that the program is related to wildfire risk and the utility accomplished more work that cost more than expected. The utility's inability to demonstrate ratepayer value from the overspending at issue here, coupled with my testimony that demonstrates the Company's *own knowledge* of the demonstrably poor

[47] Data on "forecasted tree work" in each CPZ appears to be different between TURN-8, question 3, attachment 1, CONF and TURN-2, question 1, attachment 1, CONF, leading to different results regarding trees per mile between the two data sets. However, the general trend related to where 2022 EVM work was accomplished and trees per mile remained the same.

value EVM provides, particularly given the high ecological and monetary costs, is more than enough evidence to disallow the $353.4 million of EVM overspend at issue in this proceeding.

APPENDIX A

Eric Borden, Principal Associate

Synapse Energy Economics I 485 Massachusetts Avenue, Suite 3 I Cambridge, MA 02139 I 617-453-7042
eborden@synapse-energy.com

PROFESSIONAL EXPERIENCE

Synapse Energy Economics, Inc., Cambridge, MA. *Principal Associate,* May 2022 – Present

- Sponsors expert testimony and performs analyses related to utility electric vehicle incentives and policy, wildfire mitigation strategies and costs, risk modeling, rate design, cost allocation, and revenue requirement issues in General Rate Cases and Multi-year Rate Plans.
- Conducts research and analysis related to the cost-effectiveness of distributed energy resources and Integrated Resource Plans.
- Examines utility performance incentives and provides expertise on ratemaking issues.

The Utility Reform Network (TURN), San Francisco, CA*, Energy Policy Expert,* February 2015 - May 2022

- Prepared testimony, conducted analyses, drafted comments, and represented TURN in various proceedings at the California Public Utilities Commission (CPUC) related to general rate cases, wildfire-related safety applications, electric vehicle charging infrastructure, utility procurement, rate design, and demand response.

4 Thought Energy LLC, Chicago, IL. *Senior Energy Analyst*, June 2013 – January 2015

- Created financial models to forecast profits of potential site installations
- Researched state and regional public policy frameworks governing CHP
- Conducted analyses over electricity and natural gas price trends
- Developed presentations and marketing materials for investor meetings

International Renewable Energy Agency (IRENA) Bonn, Germany. *Consultant,* February 2014 – October 2014

- Hired to write a report on worldwide electricity sector battery storage, including primary applications for renewable energy integration, market developments, trends, and case studies
- Conduct research, review literature, interview key industry players, develop case study material
- Travel to Bonn, company sites, and research facilities
- Written report will be sent to policymakers in 167 IRENA member countries

Alexander von Humboldt Foundation (hosted by DIW Berlin), Berlin, Germany. *German Chancellor Fellow*, July 2012 – November 2013

- Research Project: "Energy Storage Technology and the Large-Scale Integration of Renewable Energy"
- Investigated the role of energy storage in Germany for renewable integration through literature review, interviews with German energy experts, and analysis comparing public policy support in Germany and the U.S. for storage technologies
- Invited to hold a presentation at the International Renewable Energy Storage Conference and Exhibition (IRES 2013)
- Discussions with German businesses and governmental ministries; special visit to European Union and NATO headquarters in Brussels
- Attended energy conferences and workshops in Berlin

The Kenrich Group, LLC, Chicago, IL. *Senior Consultant*, June 2008 – July 2009

- Consulted for multiple energy utilities in legal disputes with the Department of Energy (DOE)
- Performed detailed research and quantitative/qualitative analysis to analyze financial impact related to construction of coal-fired power plants, liquid natural gas facilities, and other types of construction
- Contributed to final reports and presentations submitted in arbitration, settlement, or court of law presenting KRG's expert opinion

Charles River Associates, Chicago, IL. *Associate - Intellectual Property*, July 2006 – May 2008

- Developed complex financial models including discounted cash flow, lost profit, and regression analyses to support expert reports within the context of intellectual property and financial litigation in multiple industries
- Created valuation models and supporting materials to value business entities
- Contributed to final reports and presentations submitted in arbitration, settlement, or court of law presenting CRA's expert opinion

EDUCATION

University of Texas, LBJ School of Public Affairs, Austin, Texas
Master of Public Affairs, specialization in Natural Resources and the Environment, 2012
Washington University, St. Louis, MO
B.S.B.A. Finance, Entrepreneurship, 2006

PUBLICATIONS

Borden, E., B. Havumaki, T. Gyalmo. 2023. *Application of Discount Rates for Assessing Cost-effectiveness of Utility Risk Related Investments.* Synapse Energy Economics for The Utility Reform Network.

Borden, E., B. Havumaki, A. Lawton, M. Whited. 2023. *Establishing Income Based Fixed Charged in California.* Synapse Energy Economics for The Utility Reform Network and Natural Resources Defense Council.

Woolf, T., D. Goldberg, E. Borden, P. Rhodes. 2022. *Distributed Generation Successor Program in Maine.* Synapse Energy Economics for the Maine Governor's Energy Office and the Distributed Generation Stakeholder Group.

Battery Storage for Renewables: Market Status and Technology Outlook, International Renewable Energy Agency (IRENA), co-author with Ruud Kempener, 2015.

Germany's Energiewende, chapter 15 in Global Sustainable Communities Design Handbook, ed. Dr. Woodrow Clark, Elsevier Press, 2014.

Expert Views on the Role of Energy Storage for the German Energiewende, DIW Berlin and BMU "Stores" project, 2014.

Policy efforts for the development of storage technologies in the U.S. and Germany, DIW Discussion Paper, 2013.

Electric Vehicles and Public Charging Infrastructure: Impediments and Opportunities for Success in the United States, The University of Texas at Austin, 2012.

Clean Energy Technology and Public Policy, LBJ Journal of Public Affairs, editor and contributor, 2011.

TESTIMONY

Regulatory Commission of Alaska (U-23-048): Joint Testimony of Eric Borden and Paul Chernick in the matter of the Tariff Revisions Designated as TA-422-121 filed by Chugach Electric Association, Inc. On behalf of Renewable Energy Alaska Project (REAP) Regarding Rate Design. March 14, 2024.

Regulatory Commission of Alaska (U-23-047): Joint Testimony of Eric Borden and Paul Chernick in the matter of the Tariff Revisions Designated as TA544-8 filed by Chugach Electric Association, Inc. On behalf of Renewable Energy Alaska Project (REAP) Regarding Rate Design. March 14, 2024.

Public Service Commission of South Carolina (Docket No. 2023-233-E): Direct Testimony of Eric Borden in the matter of the Application of Duke Energy Carolina's, LLC for increase in electric rates. On behalf of the South Carolina Department of Consumer Affairs. April 8, 2024.

California Public Utilities Commission (A.23-05-010): Direct Testimony of Eric Borden addressing Southern California Edison's Test Year 2025 General Rate Case Wildfire Grid Hardening Investments. On behalf of the Utility Reform Network. February 29, 2024.

Maryland Public Service Commission (Case No.9702) Direct Testimony of Eric Borden in the matter of the Application of Potomac Electric Power Company for an Electric Multi-Year Plan for the distribution of electric energy. On behalf of The Office of People's Counsel. December 15, 2023.

New Hampshire Public Utilities Commission (Docket DE 22-060): Direct Testimony of Eric Borden and Tim Woolf regarding the Consideration of changes to the current net metering tariff structure, including compensation of customer-generators. On behalf of The Office of the Consumer Advocate. December 6, 2023.

California Public Utility Commission (R.22-11-013): Direct Testimony of Eric Borden addressing 2024 Avoided Cost Calculator Proposed Updates. On behalf of the Natural Resources Defense Council. October 30, 2023.

Nova Scotia Utility and Review Board (Docket NSUARB M11267): Evidence of Eric Borden in review Nova Scotia Power's Time Varying Pricing Pilot report. On behalf of Counsel to Nova Scotia Utility and Review Board. September 26, 2023.

Public Service Commission of Wisconsin (Docket No.6680-UR-124): Direct Testimony of Eric Borden regarding the Application of Wisconsin Power and Light Company for Authority to Adjust Electric and Natural Gas Rates. On behalf of Clean Wisconsin. September 5, 2023.

Maryland Public Service Commission (Case No.9692): Direct Testimony of Eric Borden on the matter of the Application of Baltimore Gas and Electric Company for an Electric and Gas Multi-Year Plan. On behalf of The Office of People's Counsel. June 30, 2023.

Nova Scotia Utility and Review Board (NSUARB M10960): Direct Testimony of Eric Borden on the Matter of an Application by Eastward Energy Incorporated for Approval of a Schedule of Rates, Tolls and Charges Pursuant to Section 21 of the Gas Distribution Act. On behalf of the Counsel to Nova Scotic Utility and Review Board. April 12, 2023.

California Public Utilities Commission (A.22-05-016): Prepared Testimony Addressing San Diego Gas and Electric's Test Year 2024 Wildfire Mitigation Hardening Measures and Related Wildfire Risk Modeling Issues for The Utility Reform Network. March 27, 2023.

California Public Utilities Commission (A.22-05-015/A.22-05-016): Prepared Testimony of Eric Borden and Courtney Lane Addressing Quantitative Risk Analysis Issues in Sempra's 2024 Test Year General Rate Case for The Utility Reform Network. March 27, 2023.

Public Service Commission of South Carolina (Docket No.2022-254-E): Direct Testimony of Eric Borden regarding the Application of Duke Energy Progress, LLC for Authority to Adjust and Increase its Electric Rates and Charges. On behalf of South Carolina Department of Consumer Affairs. December 1, 2022.

State of Illinois, Illinois Commerce Commission (Docket 22-0432/22-0442): Direct Testimony of Eric Borden and Courtney Lane regarding the Petition for Approval of Beneficial Electrification Plan Under the Electric Vehicle Act, 20 ILCS 627/45 And New EV Charging Delivery Classes Under the Public Utilities Act, Article IX. On behalf of The People of the State of Illinois. September 22, 2022.

Public Utilities Commission of Maine (Docket No. 2022-00152): Direct Testimony of Melissa Whited and Eric Borden regarding Central Maine Power Company's request for rate design increase and changes. On behalf of the Maine Office of the Public Advocate. December 2, 2022.

California Public Utilities Commission (A.21-06-021): Prepared Testimony Addressing Pacific Gas and Electric's Test Year 2023 General Rate Case – Wildfire Mitigation and New Customer Connections Cost Requests. June 13, 2022.

California Public Utilities Commission (A.21-09-008): Prepared Testimony Addressing the Reasonableness of Pacific Gas and Electric 2020 Vegetation Management Balancing Account Overspend. May 25. 2022.

California Public Utilities Commission (A.21-06-022): Prepared Testimony Addressing Pacific Gas and Electric's Framework for Substation Microgrid Solutions. March 30, 2022.

California Public Utilities Commission (A.21-10-010): Prepared Testimony Addressing Pacific Gas and Electric's Electric Vehicle Charge 2 Proposal. March 2, 2022.

California Public Utilities Commission (A.20-09-019): Prepared Testimony Addressing Pacific Gas and Electric's Wildfire Mitigation Memorandum Accounts. April 14, 2021.

California Public Utilities Commission (A.19-08-013): Prepared Testimony Addressing Southern California Edison's Test Year 2021 Track 2 General Rate Case Memorandum Account Request – Wildfire Expenditures. September 4, 2020.

California Public Utilities Commission (A.20-03-004): Joint Testimony with Eduyng Castano (SCE) Addressing Data Collection and Evaluation of the New Homes Battery Storage Pilot Program. September 1, 2020.

California Public Utilities Commission (A.19-10-012): Prepared Testimony Addressing San Diego Gas and Electric's Power Your Drive 2 Electric Vehicle Charging Infrastructure Proposal. May 18, 2020.

California Public Utilities Commission (A.19-08-013): Prepared Testimony Addressing Southern California Edison's General Rate Case Wildfire Management, Wildfire Risk, Vegetation Management, and New Service Connection Policy Issues and Cost Forecasts. May 5, 2020.

California Public Utilities Commission (A.18-12-009): Prepared Testimony Addressing Pacific Gas and Electric's Enhanced Vegetation Management and System Hardening Wildfire Mitigation Expenditures. July 26, 2019.

California Public Utilities Commission (A.18-09-002): Direct Testimony Addressing SCE's Grid Safety and Reliability Program Infrastructure Proposal. April 23, 2019.

California Public Utilities Commission (A.18-06-015): Rebuttal Testimony Addressing SCE's Charge Ready 2 EV Infrastructure Proposal. December 21, 2018.

California Public Utilities Commission (A.18-06-015): Direct Testimony Addressing SCE's Charge Ready 2 EV Infrastructure Proposal. November 20, 2018.

California Public Utilities Commission (A.17-12-011): Direct Testimony Regarding Potential Effects of More "Cost Based" TOU Rates and Seasonal Differentiation of Tiered Rates. October 26, 2018.

California Public Utilities Commission (A.18-02-016) et al.: Prepared Testimony Addressing Issues Pertaining to AB 2868 (Energy Storage). August 10, 2018.

California Public Utilities Commission (A.17-12-002) et al.: Prepared Testimony Addressing the Proposal of SCE for Energy Storage Procurement. April 9, 2018.

California Public Utilities Commission (A.17-01-020): Direct Testimony Addressing the Proposal of PG&E for a Fast Charging Infrastructure Program. July 25, 2017.

California Public Utility Commission (R.12-06-013): Direct Testimony Evaluating Hardship due to TOU Rates on Vulnerable Populations in Hot climate Zones. April 19, 2017.

California Public Utilities Commission (A.15-09-001): Direct Testimony Addressing the Proposal of PG&E for Electric Distribution and New Business Expenditures. April 29, 2016.

California Public Utilities Commission (A.15-02-009): Rebuttal Testimony Regarding PG&E's A.15-02-009 for EV Infrastructure and Education Program. December 21, 2015.

California Public Utilities Commission (A.15-02-009): Direct Testimony Regarding PG&E's EV Infrastructure and Education Program. November 20, 2015.

California Public Utilities Commission (A.14-11-003): Direct Testimony Addressing the Treatment of Solar Distributed Generation for Estimating Distribution System Capacity/Expansion Expenditures. May 15, 2015.

California Public Utilities Commission (A.14-04-014/R.13-11-007): Testimony Regarding SDG&E's Application for Authority to Build Electric Vehicle Charging Infrastructure. April 13, 2015.

Resume updated August 2024