March 20th, 2026

Paul Hubbs
Energy Analyst

SMUD vs PG&E Energy Rate Analysis

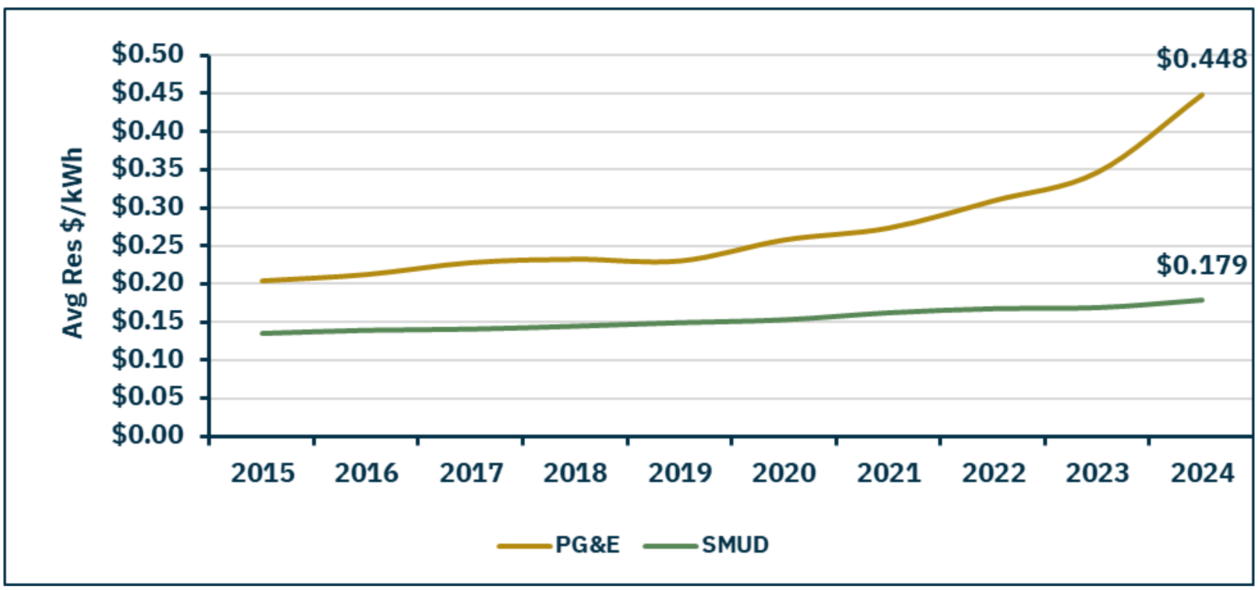
In-Depth Analysis of the Two Largest Utilities in Northern California

Northern California's electricity market is largely shaped by two major utilities: Sacramento Municipal Utility District (SMUD) and Pacific Gas and Electric Company (PG&E), which together serve millions of residents across the region. Despite operating in close geographic proximity, customers served by these utilities often pay significantly different rates for electricity. This disparity is not coincidental: SMUD and PG&E operate under fundamentally different structural and regulatory frameworks, which have major implications for how electricity prices are determined. This analysis explores the key drivers behind these differences, with a focus on how utility structure, risk exposure, and cost recovery mechanisms ultimately shape the prices consumers pay.

How Different Are PG&E and SMUD's Electricity Rates?

Before exploring the structural reasons behind these differences, it is important to first establish the magnitude of the gap. As shown in ***Figure 1*** below, residential electricity rates in PG&E's service territory have increased significantly over the past decade and remain substantially higher than those in SMUD's service area.

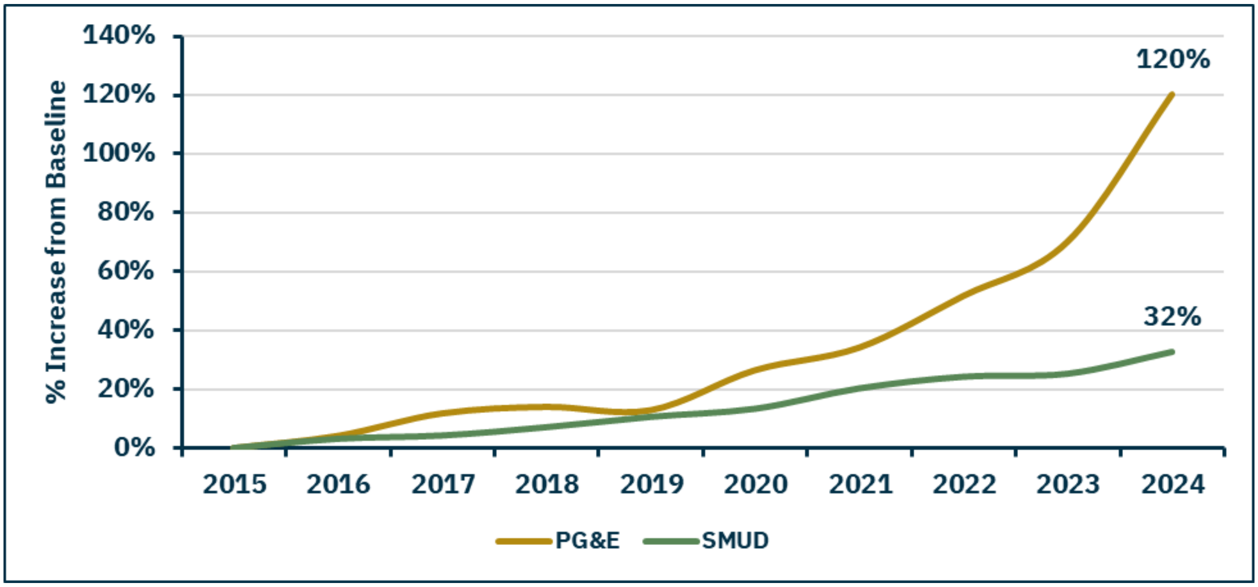
Figure 1 *- Average Residential Energy Costs ($/kWh) for PG&E and SMUD, 2015-2024*



Source: PG&E, SMUD Website

As shown in ***Figure 1***, PG&E rates have risen sharply in recent years and are now nearly three times those of SMUD in 2024. Even when accounting for the initial price disparity, PG&E rates have increased at a significantly faster pace. ***Figure 2*** illustrates this trend by showing cumulative percentage increases since 2015.

Figure 2 *- Cumulative Electricity Price Growth Since 2015 for PG&E and SMUD, 2015-2024*



Source: PG&E, SMUD Website

Taken together, these trends show that the difference in electricity rates between PG&E and SMUD is both substantial and widening over time. While both utilities have experienced rate increases, the pace of growth for PG&E has been significantly higher, particularly in recent years. This suggests that the current gap is not simply the result of historical differences but driven by ongoing structural and cost pressures. Understanding these underlying factors is critical to explaining why customers in similar regions face such different electricity prices.

The Differences Between How SMUD and PG&E Operate

To understand why electricity rates differ so significantly between SMUD and PG&E, it is helpful to first compare the key structural characteristics of each utility. While both serve Northern California customers, they operate under fundamentally different ownership models, geographic conditions, and risk profiles. These differences, summarized in **Table 1** below play a central role in shaping the costs that are ultimately passed on to consumers.

Table 1 *– Structural Differences Between SMUD and PG&E*

Factor	SMUD	PG&E
Ownership	Public	Investor Owned
Service Area	Dense/Urban	Large/Rural
Wildfire Exposure	Low	High

Ownership Structure: What It Means to Be an Investor-Owned Utility

PG&E was formed in 1905 through the consolidation of multiple smaller gas and electric companies to create a large, centralized utility serving Northern California, including the greater Sacramento area. As an investor-owned utility (IOU), it operates for profit and is accountable to shareholders, which can influence decisions on rates, infrastructure investment, and risk management under state regulation.

As an IOU, PG&E is required to generate returns for shareholders. In 2024, the company reported approximately $2.5 billion in earnings (***Figure 3***), reflecting the scale of returns expected from its operations. While not all of this is distributed directly to shareholders, these earnings are tied to the regulated return the utility is allowed to earn on its infrastructure investments, and therefore contribute to the total revenue collected from customers.

Figure 3 *- PG&E Financial Revenue and Earnings, 2024*

Financial Highlights (1)
PG&E Corporation

(unaudited, in millions, except share and per share amounts)	2024	2023
Operating Revenues	$ 24,419	$ 24,428
Income Available for Common Shareholders		
PG&E Corporation's Earnings on a GAAP basis	2,475	2,242

Source: PG&E Joint Annual Report to Shareholders (2024)

In contrast, SMUD does not have a shareholder return requirement. In 1923, Sacramento residents chose to form a publicly owned utility to provide greater local control and lower-cost service. As a result, SMUD operates on a not-for-profit basis, reinvesting revenues into the system and maintaining direct accountability to its customers through an elected board.

PG&E is permitted to earn a return on a defined set of assets known as the **rate base**, which includes infrastructure such as transmission lines, substations, and distribution equipment. In 2024, PG&E's rate base was approximately $48.8 billion (**Figure 4**).

Figure 4 *- PG&E Revenue Requirement and Rate Base ($B), 2023-2026*

Year	Revenue Requirement (in billions)		Rate Base (in billions)	
2023	$	13.52	$	45.8
2024		14.24		48.8
2025		14.60		51.2
2026		14.80		54.0

Source: PG&E Joint Annual Report to Shareholders (2024)

This rate base is financed through a combination of equity and debt. Equity represents capital provided by investors in exchange for a regulated return, while debt represents borrowed funds that must be repaid with interest. The California Public Utilities Commission (CPUC) sets an allowed return on equity, which was 10.28% in 2024, while PG&E's average cost of debt was approximately 4.8% (***Figure 5***).

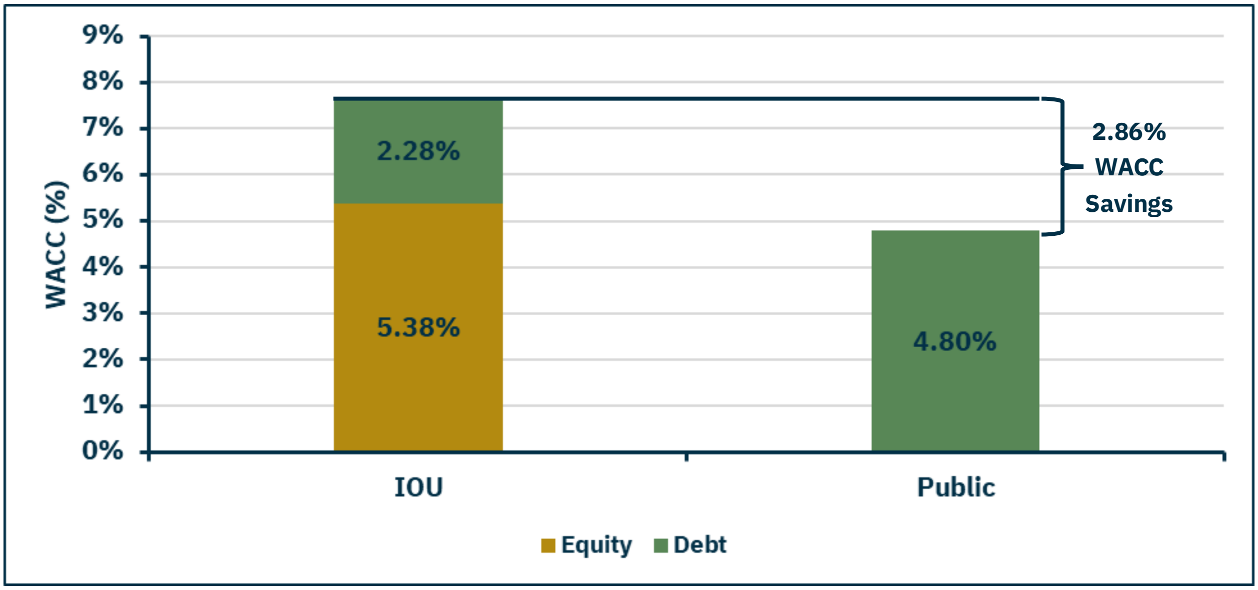
Figure 5 *- PG&E Return on Equity and Weighted Cost of Capital (WACC), 2024*

	Cost	Weight	Weighted Cost
Return on Common Equity	10.28 %	52.00%	5.35%
Return on Preferred Equity	5.52 %	0.50%	0.03%
Return on Long-term debt	4.80 %	47.50%	2.28%

Source: PG&E Joint Annual Report to Shareholders (2024)

If PG&E were structured as a public utility, the equity portion of its capital structure would largely be replaced with debt financing, which typically carries a lower cost. As shown in ***Figure 6***, this results in a reduction in the weighted average cost of capital (WACC) from approximately 7.66% to an estimated ~4.5%, a difference of **2.86 percentage points**.

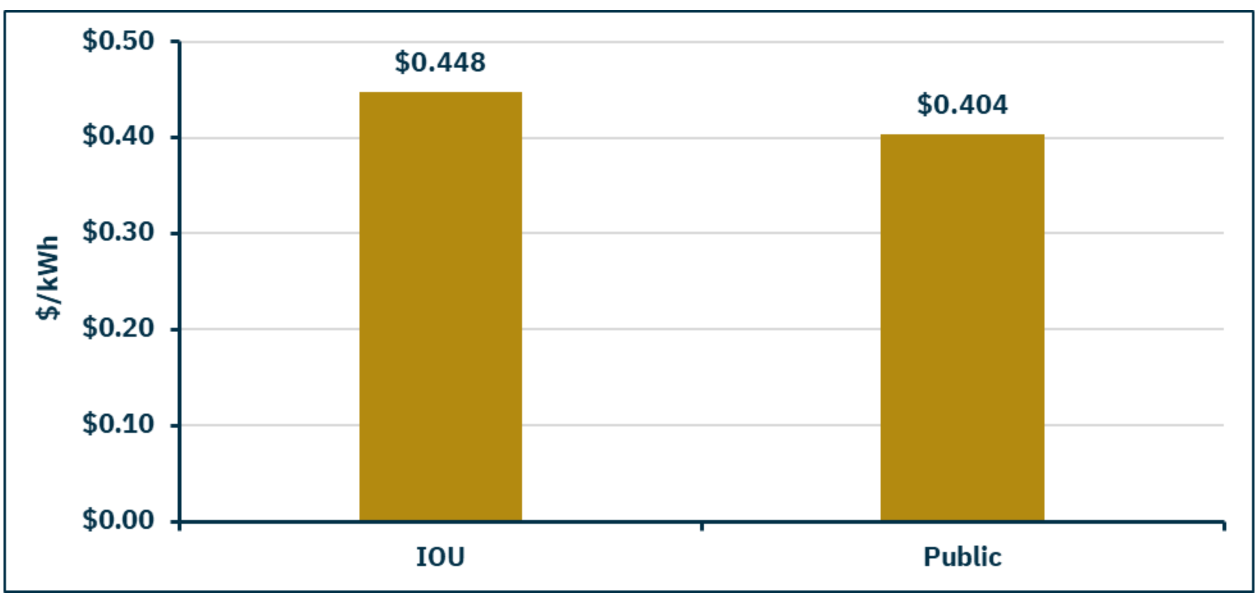
Figure 6 *- PG&E Cost of Capital as an IOU vs as a Public Utility, 2024*



Source: PG&E Joint Annual Report to Shareholders (2024)

Applying this difference to PG&E's $48.8 billion rate base results in an estimated reduction in annual financing costs of approximately $1.4 billion. Relative to a 2024 revenue requirement of $14.24 billion, this corresponds to roughly a **10% reduction in required revenue**. If these savings were fully passed through to customers, assuming changes in revenue requirement are directly proportional to changes in volumetric rates, this would imply a similar reduction in electricity prices. See the estimated reduction in ***Figure 7*** below.

Figure 7 *- PG&E Estimated Electricity Rates as an IOU vs Public Utility, 2024*



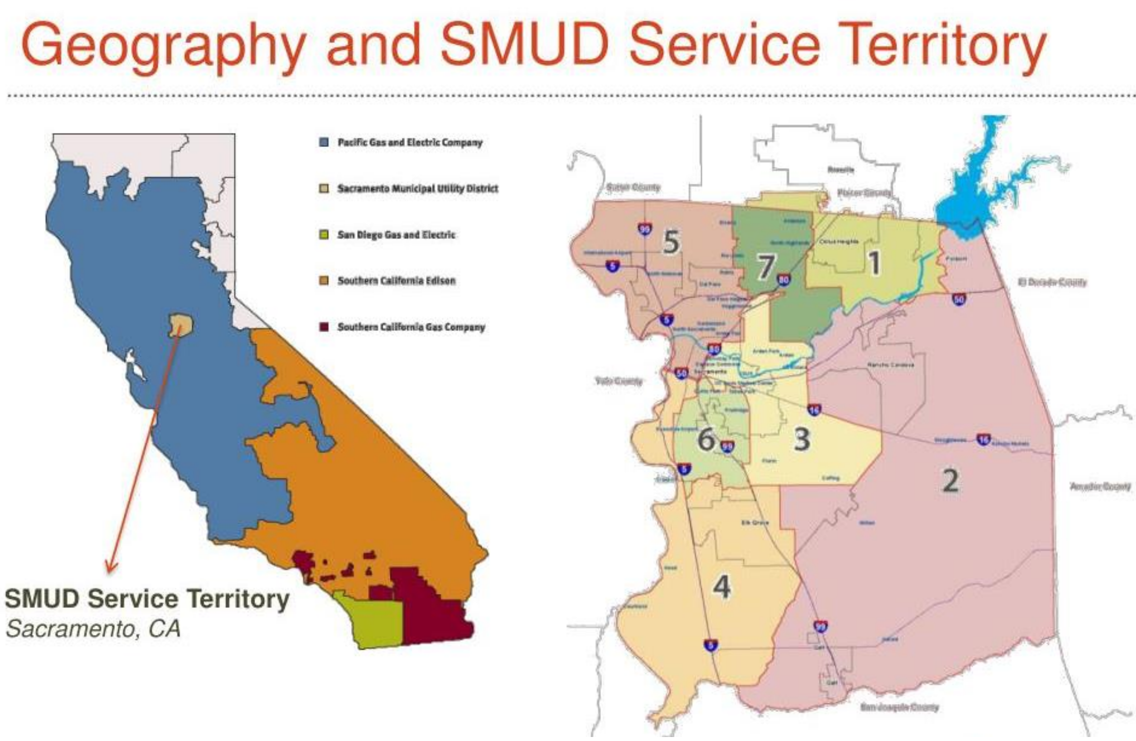
Source: PG&E Joint Annual Report to Shareholders (2024)

Under this framework, a residential rate of approximately $0.45/kWh would decrease to roughly $0.40/kWh, a reduction of about **$0.05/kWh**. This estimate is intended to illustrate the order of magnitude of potential savings rather than a precise forecast. In practice, actual rate impacts would depend on regulatory decisions, rate design, and cost allocation across customer classes. As discussed in subsequent sections, financing structure is only one of several factors influencing the overall cost differences between PG&E and SMUD.

Key Differences in Service Area: Urban vs Rural Landscapes

Service territory characteristics are a primary driver of electricity costs. SMUD serves a dense, predominantly urban population within a relatively compact geographic area. In contrast, PG&E operates across a vast and geographically diverse territory that includes extensive rural and mountainous regions. ***Figure 8*** illustrates the stark contrast in service territories between the two utilities.

Figure 8 *- PG&E vs SMUD Service Territory Map, 2024*



Source: SMUD

This difference in customer density has a direct impact on how infrastructure costs are allocated. In dense urban environments, infrastructure investments can be spread across a larger number of customers within a smaller area. In more rural territories, utilities must build and maintain significantly more infrastructure per customer served.

Table 2 *- PG&E vs SMUD Customer Service Density Profile, 2024*

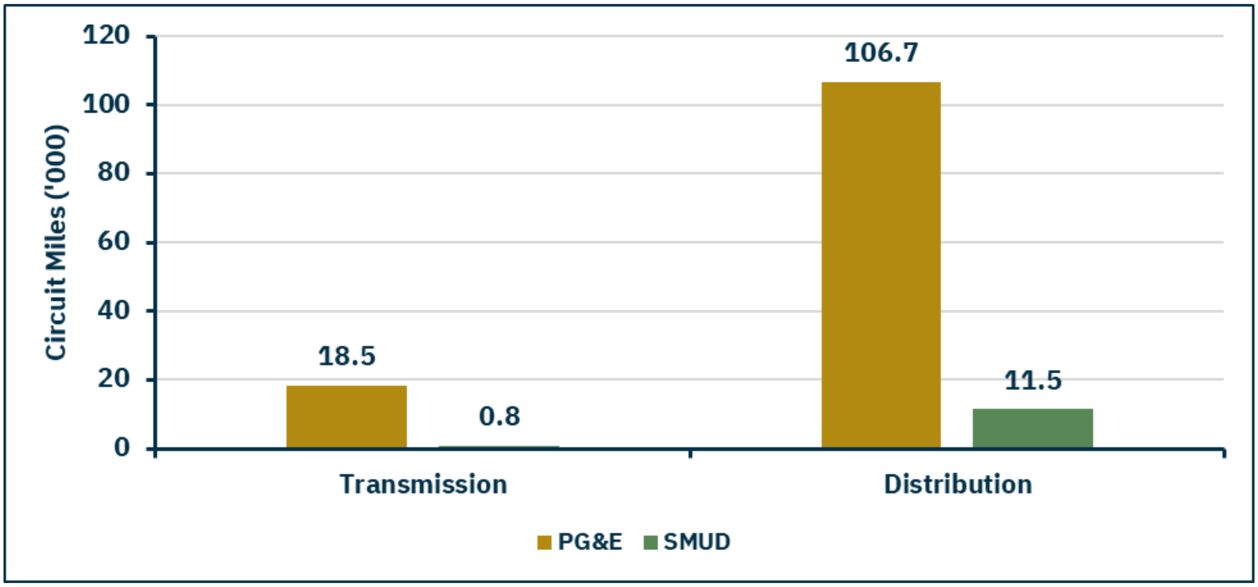
Utility	Customers (#)	Service Area (Mi^2)	Customers/Mi^2
PG&E	5,500,000	70,000	78.6
SMUD	685,495	900	761.7

Source: SMUD, PG&E, Independent Analysis

SMUD serves approximately 10 times more customers per square mile than PG&E. This higher density allows infrastructure investments such as substations, distribution lines, and local grid assets to serve a significantly larger customer base.

By contrast, PG&E must extend infrastructure over long distances to reach smaller and more dispersed populations. In many cases, the infrastructure required to serve a remote community of a few thousand customers is comparable to that required for a much larger urban population, resulting in higher costs on a per-customer basis.

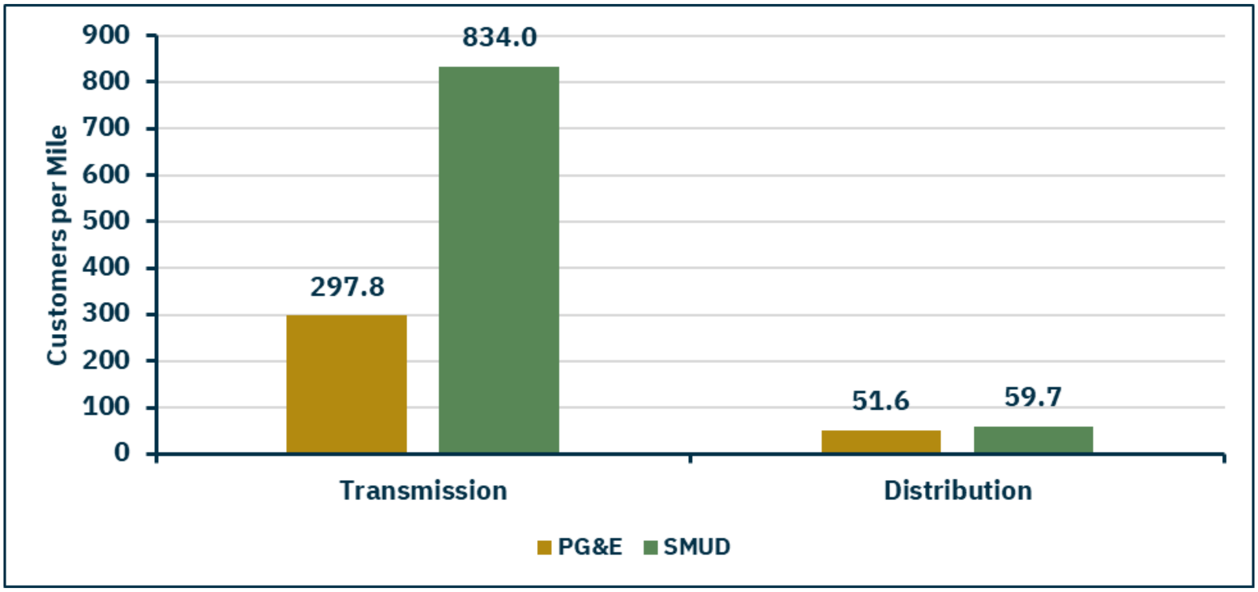
Figure 9 *- PG&E vs SMUD Circuit Miles of Infrastructure, 2024*



Source: SMUD, PG&E, California Energy Commission (CEC), Independent Analysis

However, total infrastructure alone does not fully explain cost difference. Customer count must also be considered. ***Figure 9*** compares total transmission and distribution circuit miles between the utilities. To better understand cost burden, it is useful to normalize infrastructure by customer base.

Figure 10 *- PG&E vs SMUD Customers per Mile of Infrastructure, 2024*



Source: SMUD, PG&E, California Energy Commission (CEC), Independent Analysis

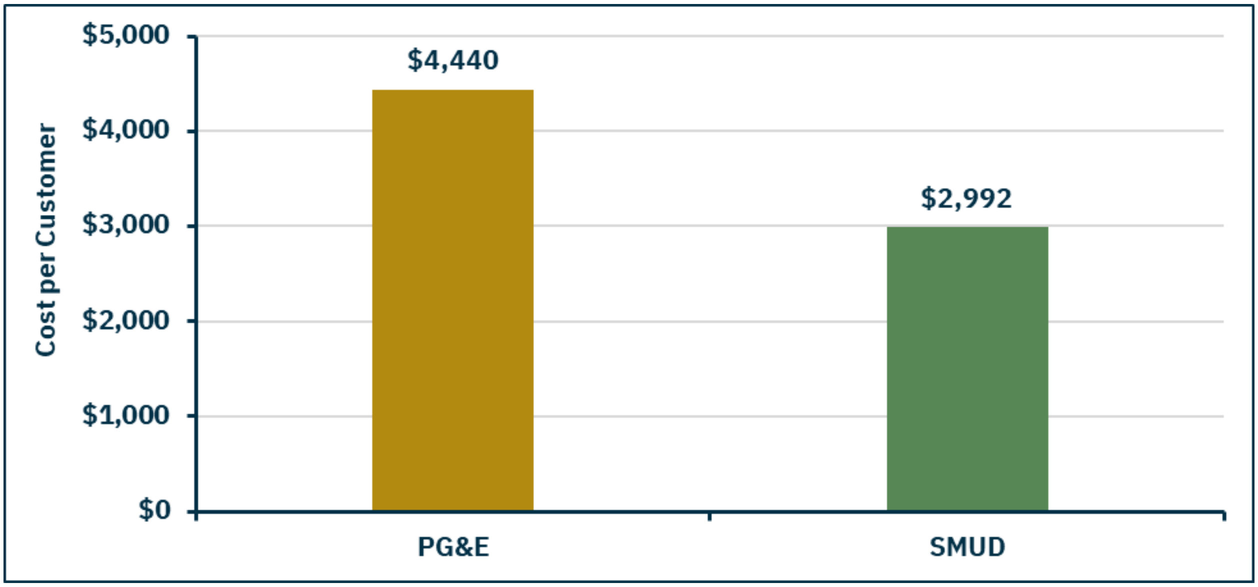
When viewed on a per-customer basis:

- Distribution infrastructure appears relatively comparable between the two utilities
- PG&E serves far fewer customers per mile of transmission infrastructure

This reflects a structural reality: PG&E must build long-distance transmission lines to connect geographically dispersed communities, while SMUD operates within a more localized network.

These structural differences ultimately influence each utility's revenue they collect. Electricity rates are driven by how total system costs are distributed across customers. A useful proxy for this is cost per customer, defined as total revenue requirement divided by number of customers. ***Figure 11*** presents this comparison for 2024.

Figure 11 *- PG&E vs SMUD Cost per Customer, 2024*



Source: SMUD, PG&E, Independent Analysis

SMUD's cost per customer is significantly lower than PG&E's, reflecting:

- higher customer density
- more efficient infrastructure utilization
- reduced need for long-distance transmission investment

The cost disparity between SMUD and PG&E is largely driven by structural differences in service territory rather than operational efficiency alone. Utilities serving low-density, rural areas face inherently higher infrastructure costs per customer due to the need to build and maintain long-distance transmission and distribution networks.

As a result, industry experts generally recognize that there is **no single solution** to fully eliminate this cost gap. Instead, a combination of strategies is being explored.

One potential approach is the targeted deployment of microgrids in remote or high-cost areas. These localized energy systems, typically consisting of solar generation and battery storage, can reduce the need for expensive long-distance infrastructure and improve resilience in wildfire-prone regions. However, microgrids are not a universal solution and are most effective only in specific, high-cost use cases.

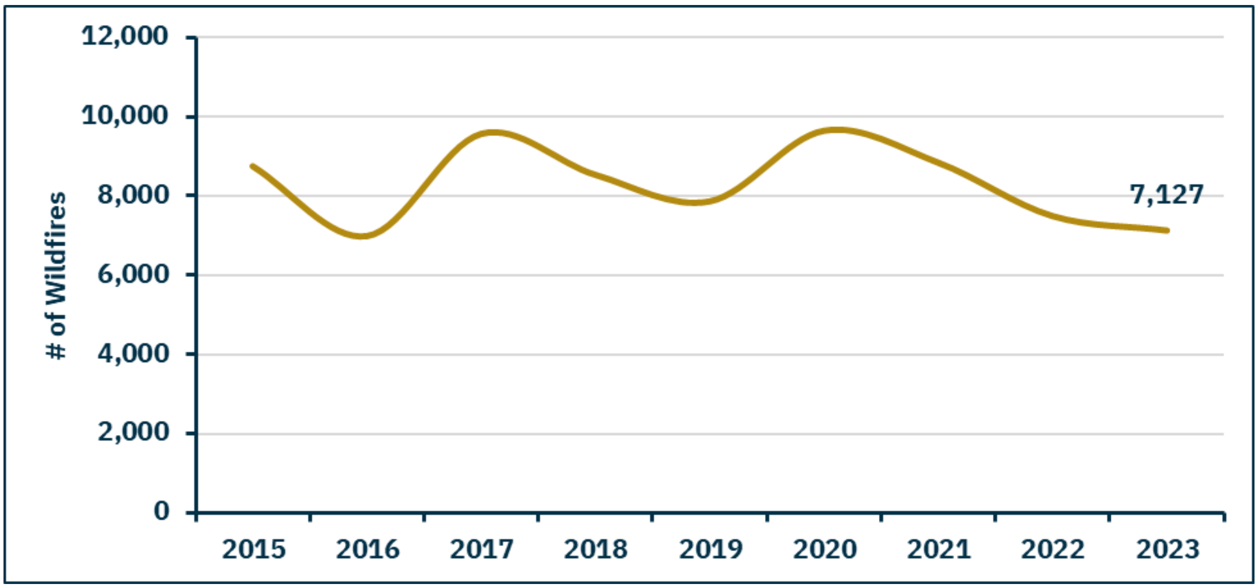
Ultimately, the economic reality remains that **serving geographically dispersed populations is inherently more expensive**. As a result, policymakers and regulators must balance cost efficiency with equity considerations when determining how these costs are allocated across customers.

Natural Disaster Risk: PG&E's Exposure to Wildfires

Wildfire risk has become one of the most significant drivers of electricity costs for PG&E in recent years. A series of major wildfires including the 2018 Camp Fire, the 2017 Tubbs Fire, and the 2021 Dixie Fire have been linked to utility equipment failures, resulting in substantial financial liabilities and regulatory changes.

These events occur within a broader context of increasing wildfire risk across California, driven by prolonged drought, higher temperatures, and dense vegetation. PG&E's service territory spans large, forested, and mountainous regions, exposing its infrastructure to significantly greater wildfire risk compared to more urban utilities such as SMUD.

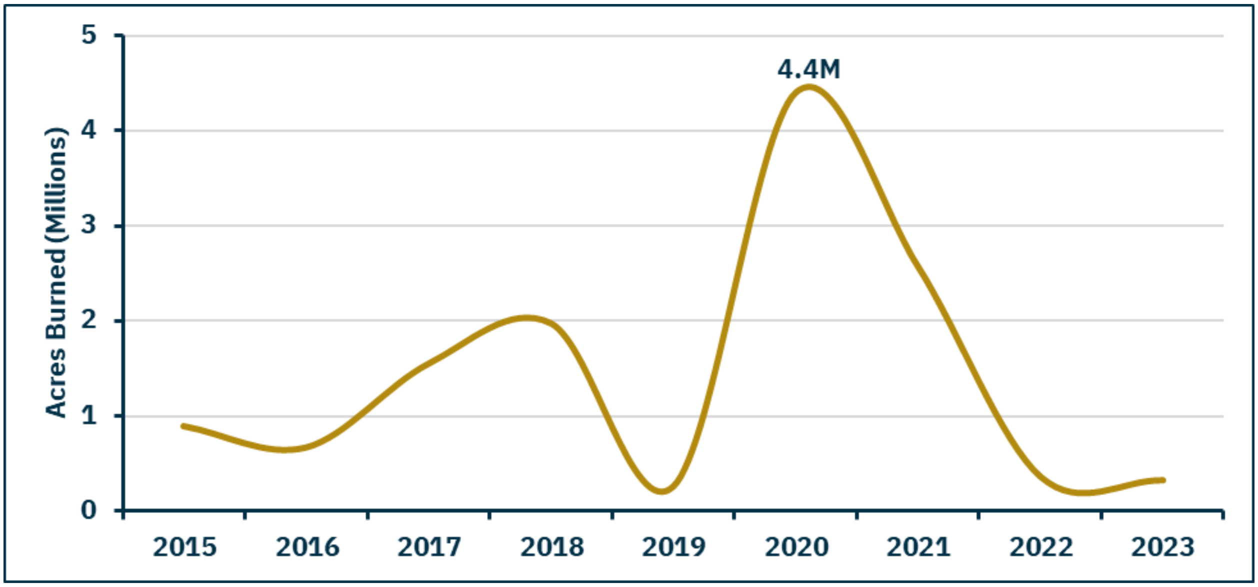
Figure 12 *- Count of California Wildfires by Year*



Source: CalFIRE

While the number of wildfire incidents has remained relatively stable over this period, this metric alone does not capture the growing societal impact of wildfires. ***Figure 13*** presents total acres burned by year, which more accurately reflects wildfire severity.

Figure 13 *- Count of Acres Burned by California Wildfires by Year*



Source: CalFIRE

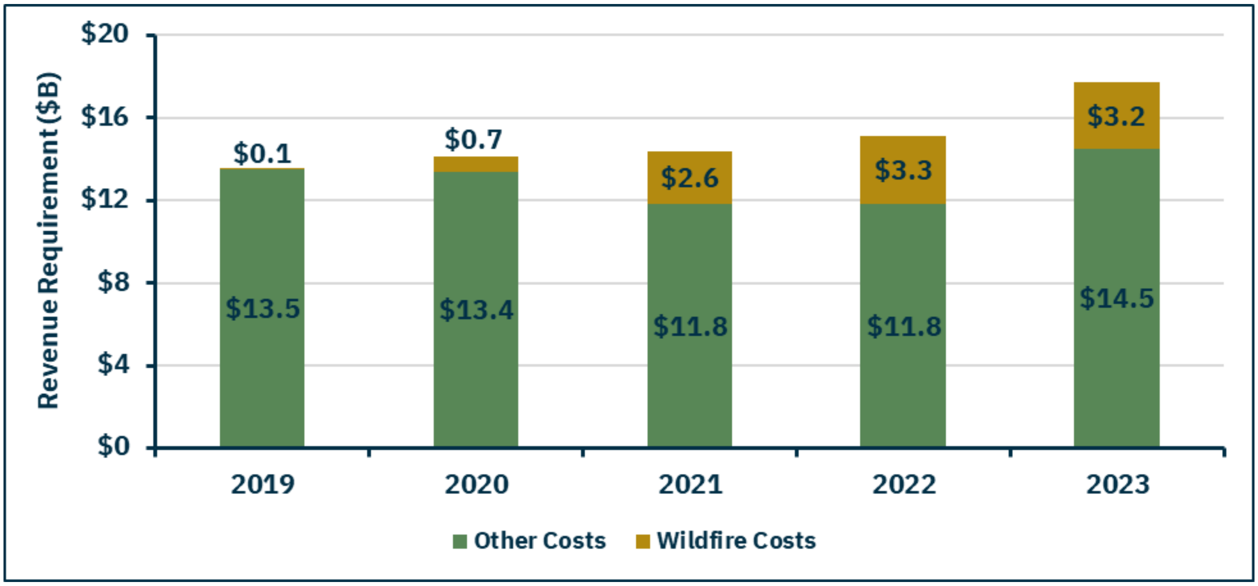
As shown, wildfire damage has become significantly more volatile and severe, peaking in 2020 with approximately 4.4 million acres burned. This divergence between relatively stable fire counts and rapidly increasing burn area highlights a key shift: wildfires are becoming more destructive, even if they are not occurring more frequently.

In response to this increasing severity and the financial consequences of past wildfire events, PG&E has significantly expanded its wildfire mitigation efforts. These include:

- Undergrounding power lines
- Expanded vegetation management programs
- Grid hardening and equipment upgrades
- Enhanced system monitoring and risk forecasting

While these measures are effective at reducing wildfire risk, they require substantial and ongoing investment. **Figure 14** illustrates the growing share of PG&E's revenue requirement dedicated to wildfire-related costs.

Figure 14 - PG&E Portion of Revenue Going Towards Wildfire Prevention



Source: CalFIRE, PG&E

Wildfire-related expenditures increased from approximately $0.1 billion in 2019 to $3.2 billion in 2023, representing a more than **30-fold increase** over a relatively short period. Over the same timeframe, these costs have grown from a negligible portion of total expenses to a material component of PG&E's overall cost structure.

Although cost recovery is subject to regulatory approval, a significant portion of these wildfire-related investments is ultimately reflected in customer rates.

To estimate the impact of wildfire-related costs on electricity prices, wildfire expenditures can be normalized by total electricity sales. In 2024, PG&E delivered approximately 74,111 GWh of electricity. Using 2023 wildfire-related costs of approximately $3.2 billion, the implied rate impact can be estimated as:

- Wildfire Rate Impact ≈ $3.2B ÷ 74,111 GWh ≈ **$0.043/kWh**

Given that typical residential electricity customer in PG&E's service territory range is paying approximately $0.44 cents per kWh, this suggests that wildfire-related costs may account for roughly 10% of total electricity prices.

While this estimate is directional and subject to regulatory cost allocation and multi-year cost recovery mechanisms, it illustrates that wildfire mitigation and risk management represent a substantial component of customer electricity bills.

Understanding the Drivers of Electricity Cost Differences

The difference in electricity rates between PG&E and SMUD is not the result of a single factor, but rather the interaction of multiple structural, geographic, and financial forces. While it is tempting to attribute higher costs to inefficiency or mismanagement, the analysis presented here suggests a more nuanced reality: much of the disparity is rooted in the fundamentally different conditions under which each utility operates.

At the most foundational level, service territory characteristics play a central role. SMUD's dense, urban footprint allows infrastructure investments to be deployed efficiently across a large customer base, minimizing cost per customer. In contrast, PG&E's expansive and geographically diverse territory requires significantly more infrastructure per customer, particularly in transmission networks that must span long distances to reach dispersed populations. This structural difference alone creates a persistent cost disadvantage that cannot be easily eliminated without fundamentally changing how and where people live.

Overlaying these geographic constraints is the growing impact of wildfire risk. PG&E operates in regions that are increasingly exposed to severe and destructive wildfires, necessitating substantial and ongoing investment in mitigation measures such as undergrounding, vegetation management, and grid hardening. These investments are not optional. They are required to ensure system safety and reliability. As demonstrated in this analysis, wildfire-related costs now represent a meaningful share of PG&E's total revenue requirement and contribute directly to higher customer rates. Unlike operational inefficiencies, these costs are largely driven by environmental conditions and regulatory requirements, making them difficult to reduce without compromising safety.

Ownership structure further contributes to the observed cost differences. As an investor-owned utility, PG&E is required to provide a regulated return on equity, which increases its overall cost of capital relative to a publicly owned utility like SMUD. This analysis estimates that this financing structure alone may account for approximately a 10% difference in electricity rates. While significant, this factor explains only a portion of the total disparity, reinforcing the conclusion that no single driver fully accounts for the gap.

Taken together, these findings suggest that the lower rates observed in SMUD's service territory are not solely the result of superior operational performance, but rather the advantages of a favorable structural environment: high customer density, limited exposure to wildfire risk, and a public ownership model that reduces financing costs. Conversely, PG&E faces a combination of structural challenges that inherently increase the cost of providing electricity.

This distinction has important implications for policy and public discourse. Efforts to reduce electricity costs must recognize that some cost drivers, such as geography and climate-related risk, are largely outside the control of utilities. At the same time, there are elements of the system that can be influenced. SMUD's model demonstrates the potential benefits of lower-cost financing and locally governed decision-making, suggesting that ownership structure and capital strategy can meaningfully impact long-term affordability.

However, even under an alternative ownership model, significant cost differences would likely remain due to PG&E's unique operating environment. As a result, policy solutions should be evaluated not only in terms of cost reduction, but also in terms of feasibility and system reliability.

Ultimately, the disparity between PG&E and SMUD highlights a broader challenge facing the energy sector: how to deliver affordable electricity in regions with fundamentally different risk profiles and infrastructure requirements. Addressing this challenge will require a balanced approach that acknowledges both the limits of what can be changed and the opportunities for targeted improvements within those constraints.