

Understanding California's Power Shutoffs

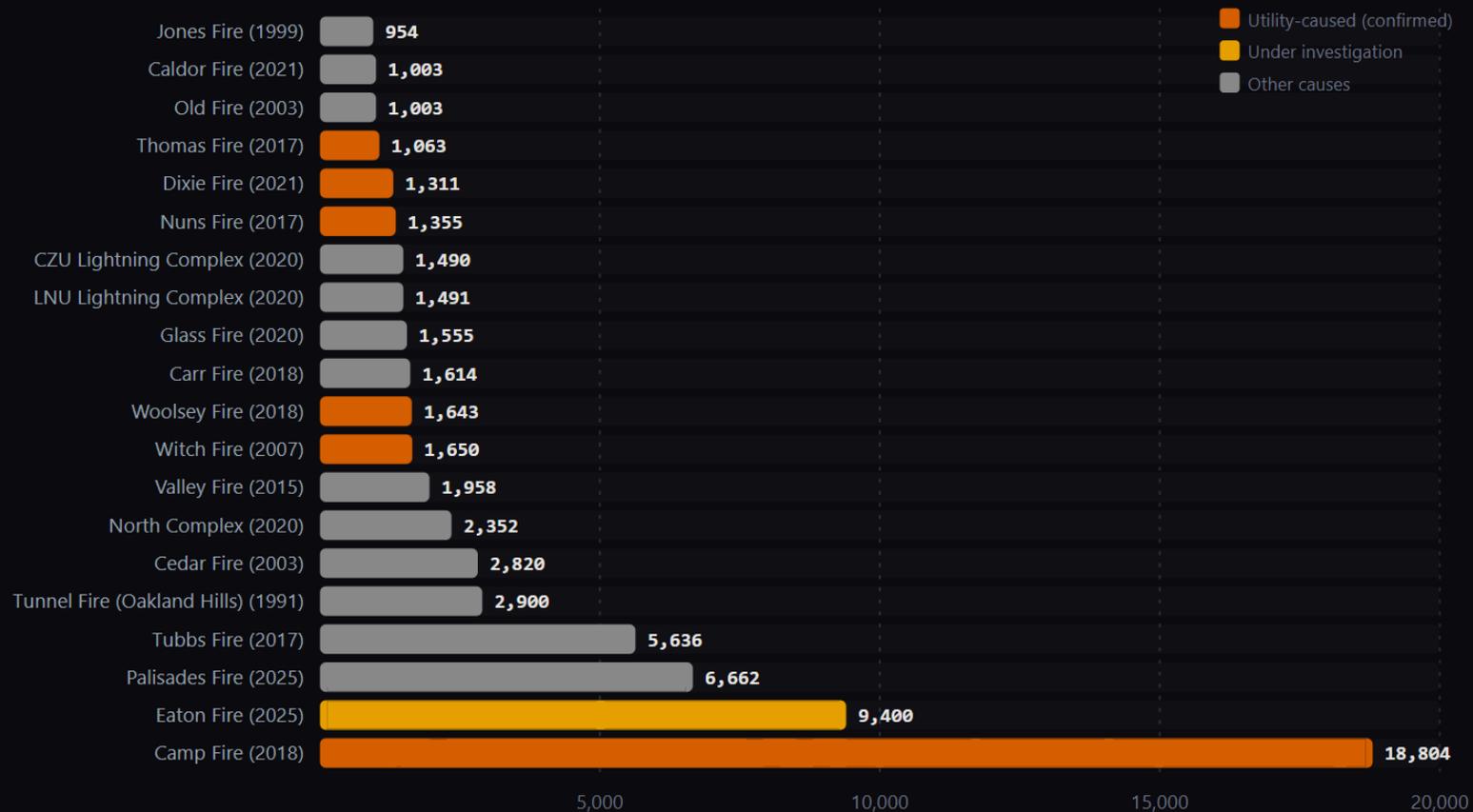
A data-driven analysis of 7,150 PSPS events across 2,294 circuits — duration, concentration, and effectiveness

Igor Geyn · February 2026

Full analysis: igorgeyn.com/blog

Utility Fires: 5% of Ignitions, 50% of Destruction

Of California's 20 most destructive wildfires, utility equipment caused or is under investigation for fires destroying over 35,000 structures and killing 115 people. PSPS exists because the alternative has been catastrophic.



Why this matters: PSPS exists because the alternative — leaving lines energized during fire weather — has caused the most destructive wildfires in state history.

CAL FIRE Top 20 Most Destructive. Utility-caused = confirmed by investigation or settlement.

The Dataset

Every Public Safety Power Shutoff event reported to the CPUC from 2019 through early 2025, across California's three investor-owned utilities.

7,150

PSPS circuit-events

2,294

circuits affected

352M

customer-hours

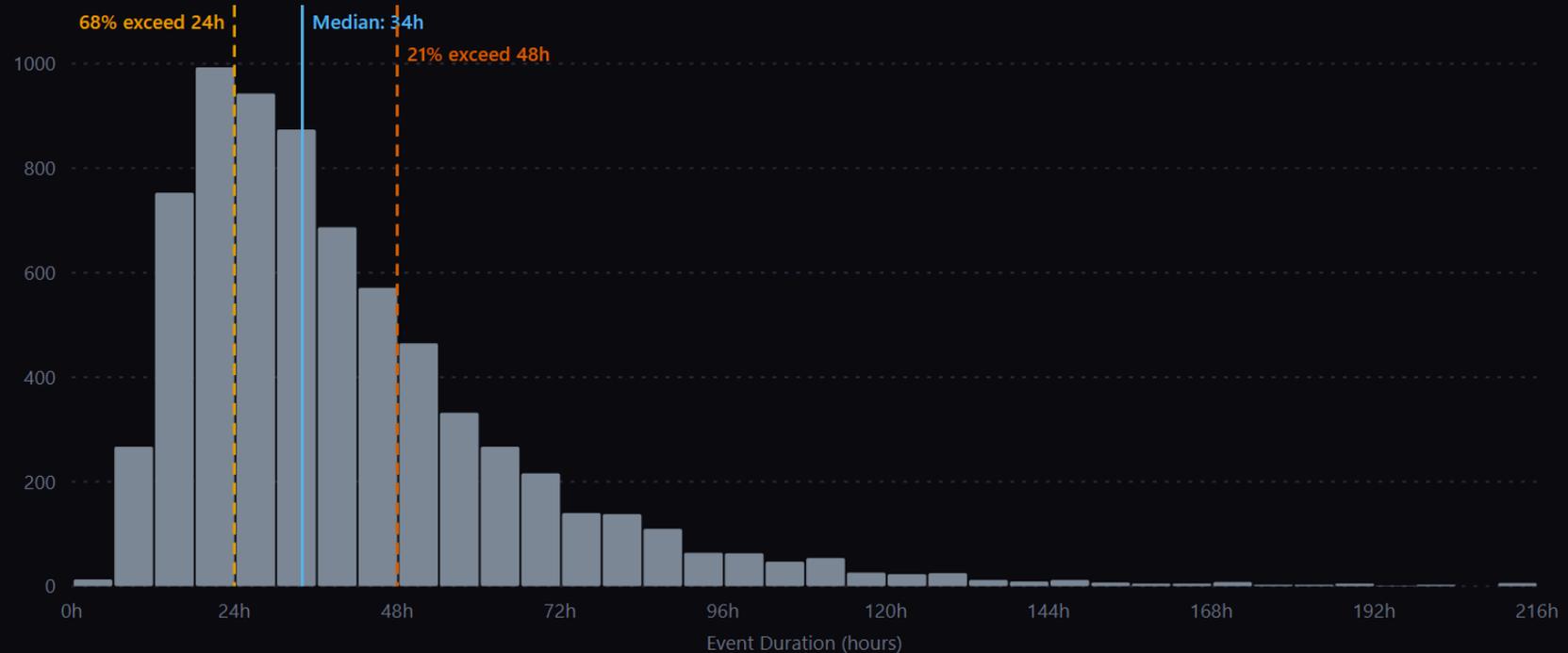
34

hour median duration

Three investor-owned utilities — PG&E, SCE, and SDG&E — serving 25 million customers across fire-prone terrain. **67%** of all PSPS customer-hours are concentrated in October.

The Duration Problem: Median 34 Hours

The median PSPS event lasts 34 hours — a day and a half. 68% of events exceed 24 hours, and one in five exceeds 48 hours.



Why this matters: A 34-hour median shutoff exceeds the backup capacity of virtually all residential battery systems. The long right tail means 10% of events exceed 72 hours — three full days without power.

CPUC PSPS reporting data, 2019–2025. $n = 7,150$ circuit-events.

The Battery Gap: 13 Hours vs. 34 Hours

The median installed residential battery provides approximately 13 hours of critical-load backup. The median PSPS event lasts 34 hours. That leaves a 21-hour gap with no backup power.

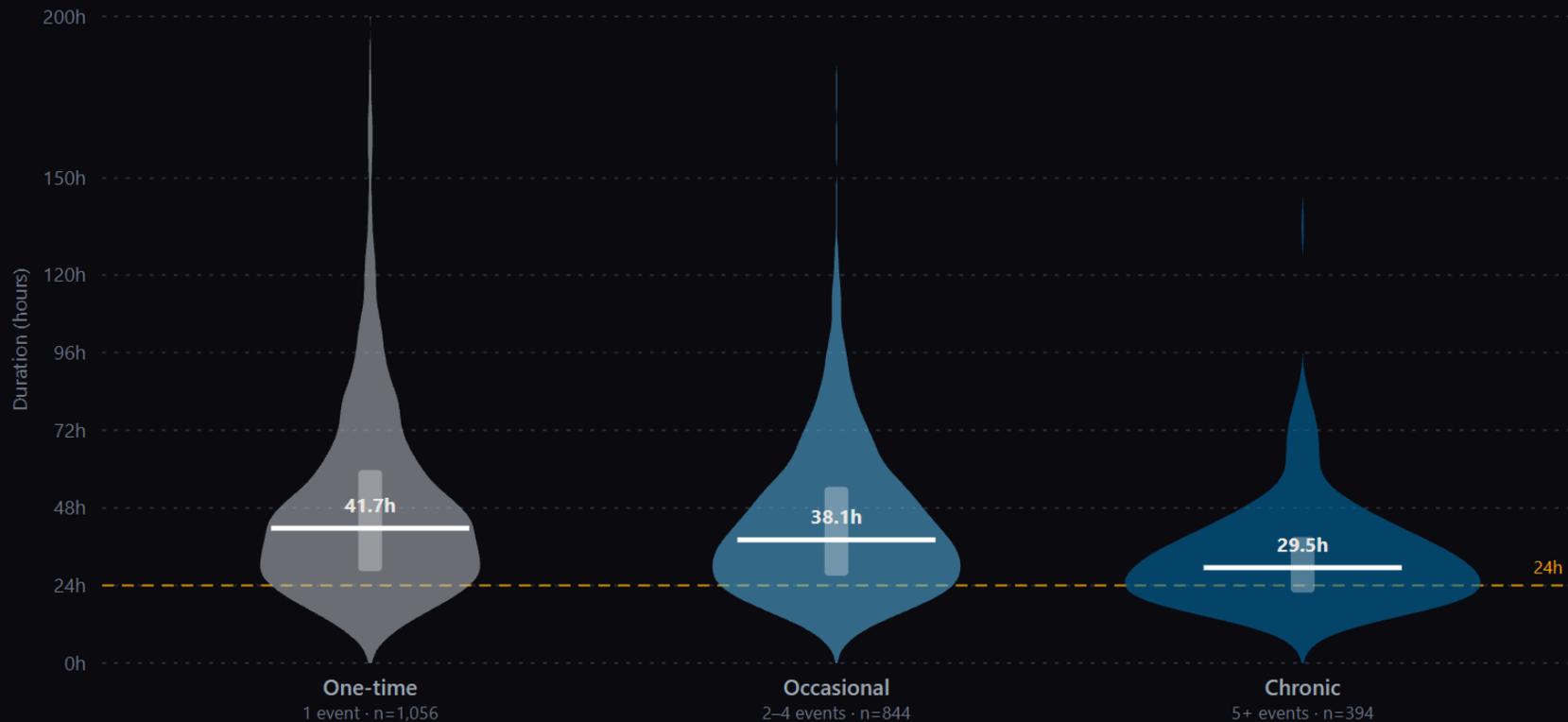


Why this matters: Battery storage is often proposed as a PSPS mitigation, but typical systems cover less than 40% of the median shutoff. Only 1.1% of installed residential batteries have enough capacity for a 48-hour event.

Battery capacity: median SGIP residential installation (13.2 kWh). Duration: CPUC PSPS data.

Duration Paradox: One-Time Circuits Last Longest

Counterintuitively, circuits experiencing PSPS only once have the longest median duration (41.7 hours). Chronic circuits (5+ events) have the shortest (29.5 hours) — repeat shutoffs tend to be shorter and more targeted.

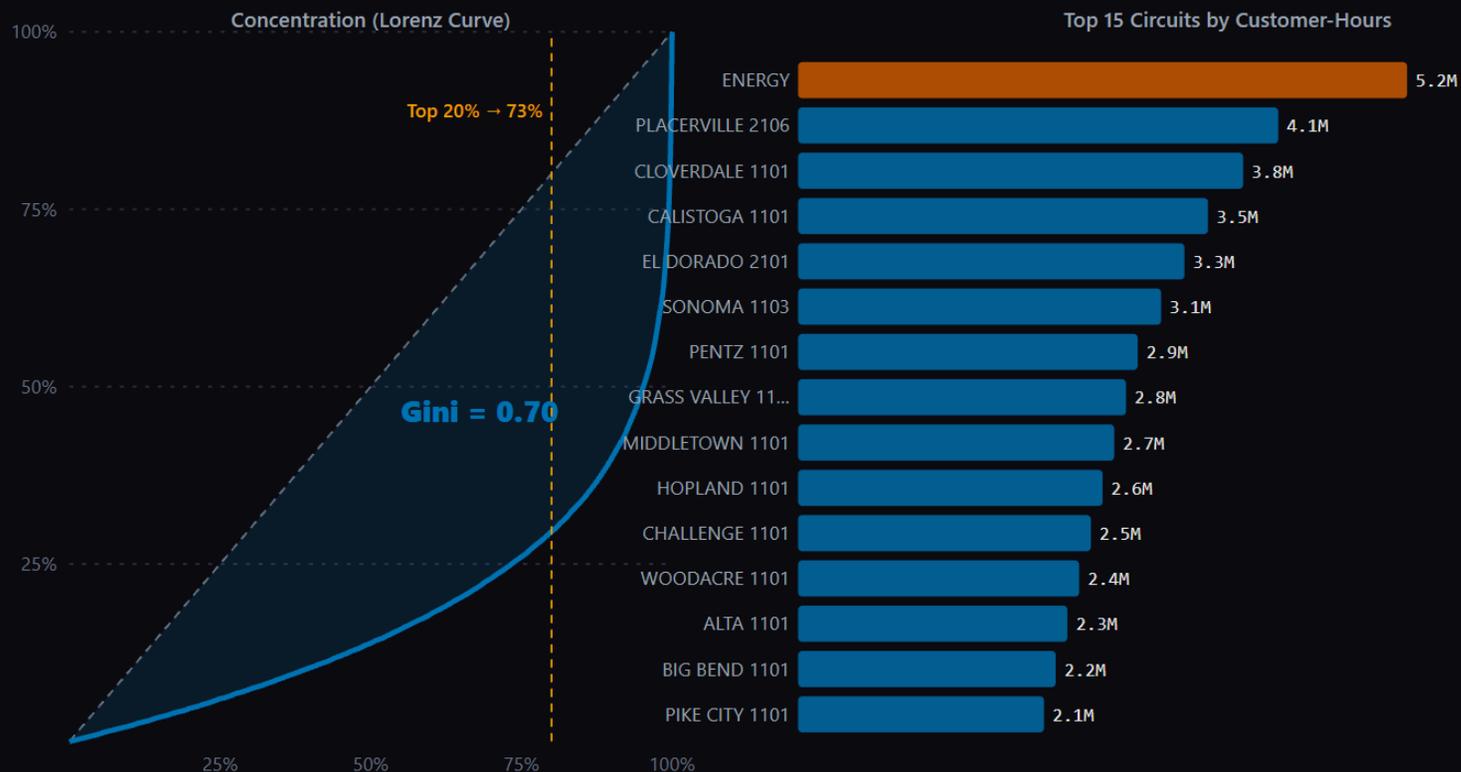


Why this matters: Frequency and severity are not the same problem. One-time circuits face longer individual events; chronic circuits accumulate burden through repetition. Different problems require different interventions.

KDE bandwidth = 4h. White lines = medians. Boxes = IQR. n = 2,294 circuits.

Extreme Concentration: Gini 0.70

The top 10% of circuits account for 47% of all customer-hours; the top 20% account for 73%. The bottom half account for just 5%.

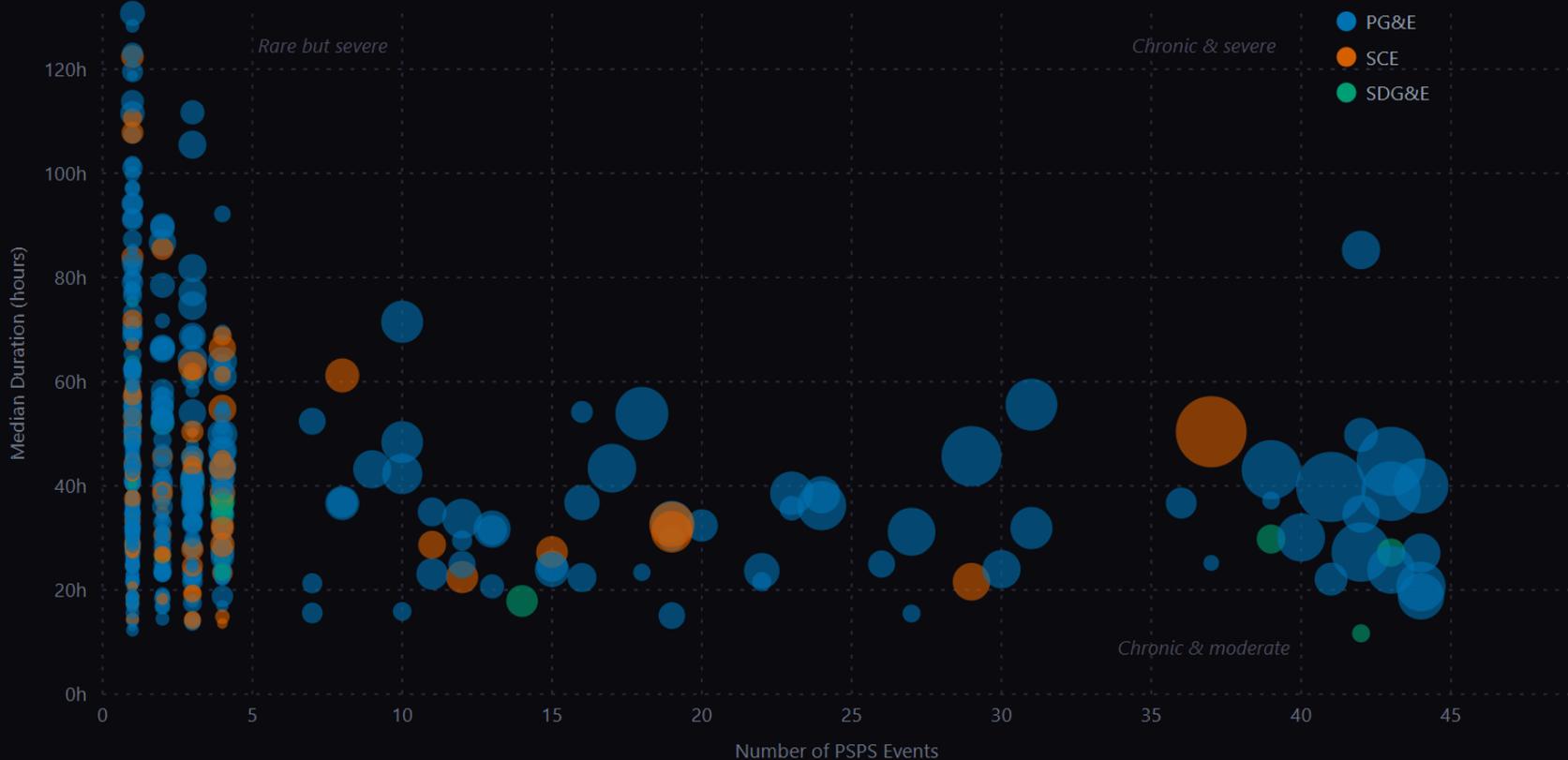


Why this matters: A small number of circuits — and the communities they serve — bear a vastly disproportionate share of the burden. Targeted investment in these circuits would have outsized impact.

Lorenz curve from circuit-level customer-hours. Gini coefficient = 0.70. n = 2,294 circuits.

Circuit Burden Patterns

Each bubble is one of 2,294 circuits. Size indicates total customer-hours. The weak negative correlation between frequency and duration reveals that high-frequency circuits tend toward shorter, more targeted shutoffs.

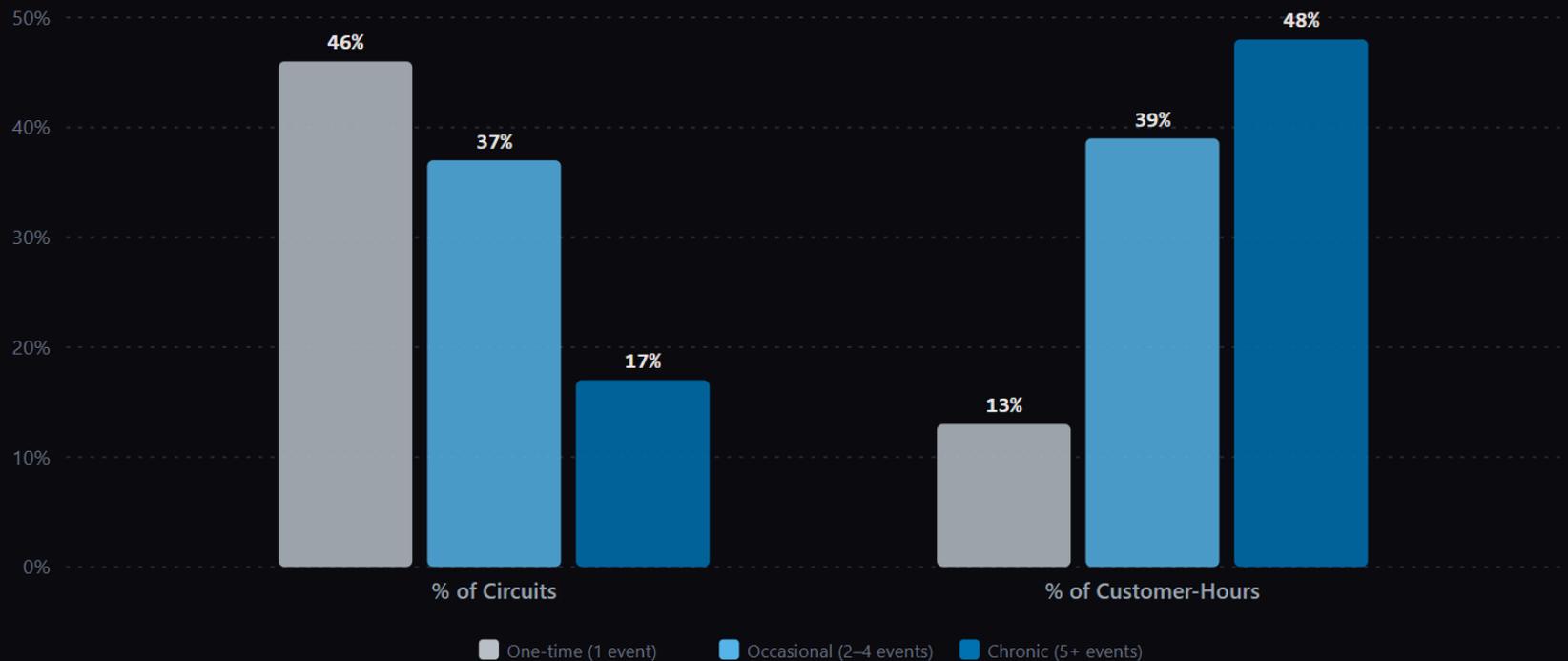


Why this matters: High-frequency circuits benefit from grid hardening (undergrounding, covered conductor). Low-frequency but long-duration circuits need resilience infrastructure (microgrids, backup power). Different problems, different solutions.

Circuit-level aggregation, 2019–2025. Bubble size = total customer-hours. Click legend to filter.

17% of Circuits Bear 48% of the Burden

Circuits classified by PSPS frequency: one-time (1 event), occasional (2–4), and chronic (5+). Chronic circuits are just 17% of all affected circuits but account for nearly half of total customer-hours.

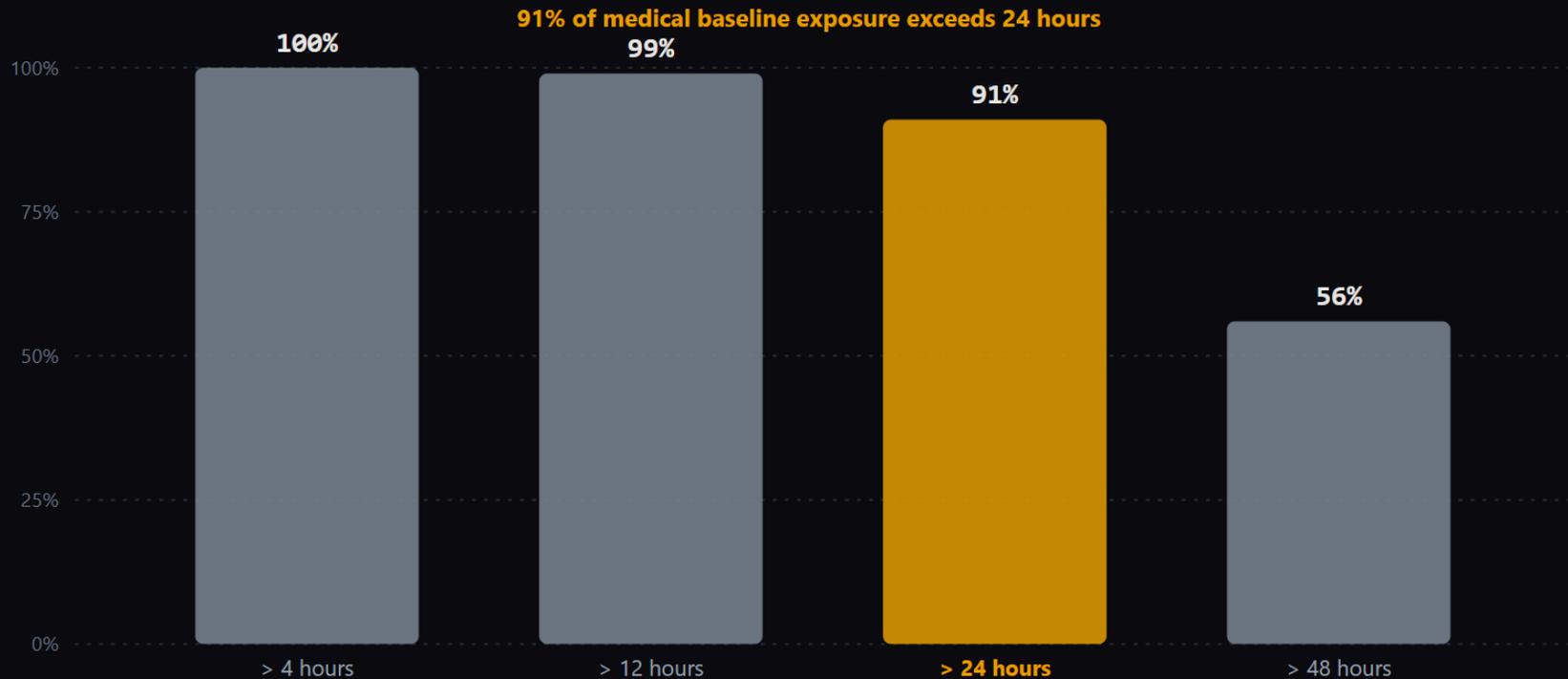


Why this matters: 394 chronic circuits are the highest-priority targets for infrastructure investment. Hardening these circuits — through undergrounding, covered conductors, or sectionalization — could reduce total PPS burden by nearly half.

One-time = 1 event, occasional = 2–4 events, chronic = 5+ events. n = 2,294 circuits.

Vulnerable Populations: 91% Beyond 24 Hours

Medical baseline customers — those dependent on electrically powered medical equipment — face acute risk during extended PSPS events. 91% of their total exposure occurs during events exceeding 24 hours.

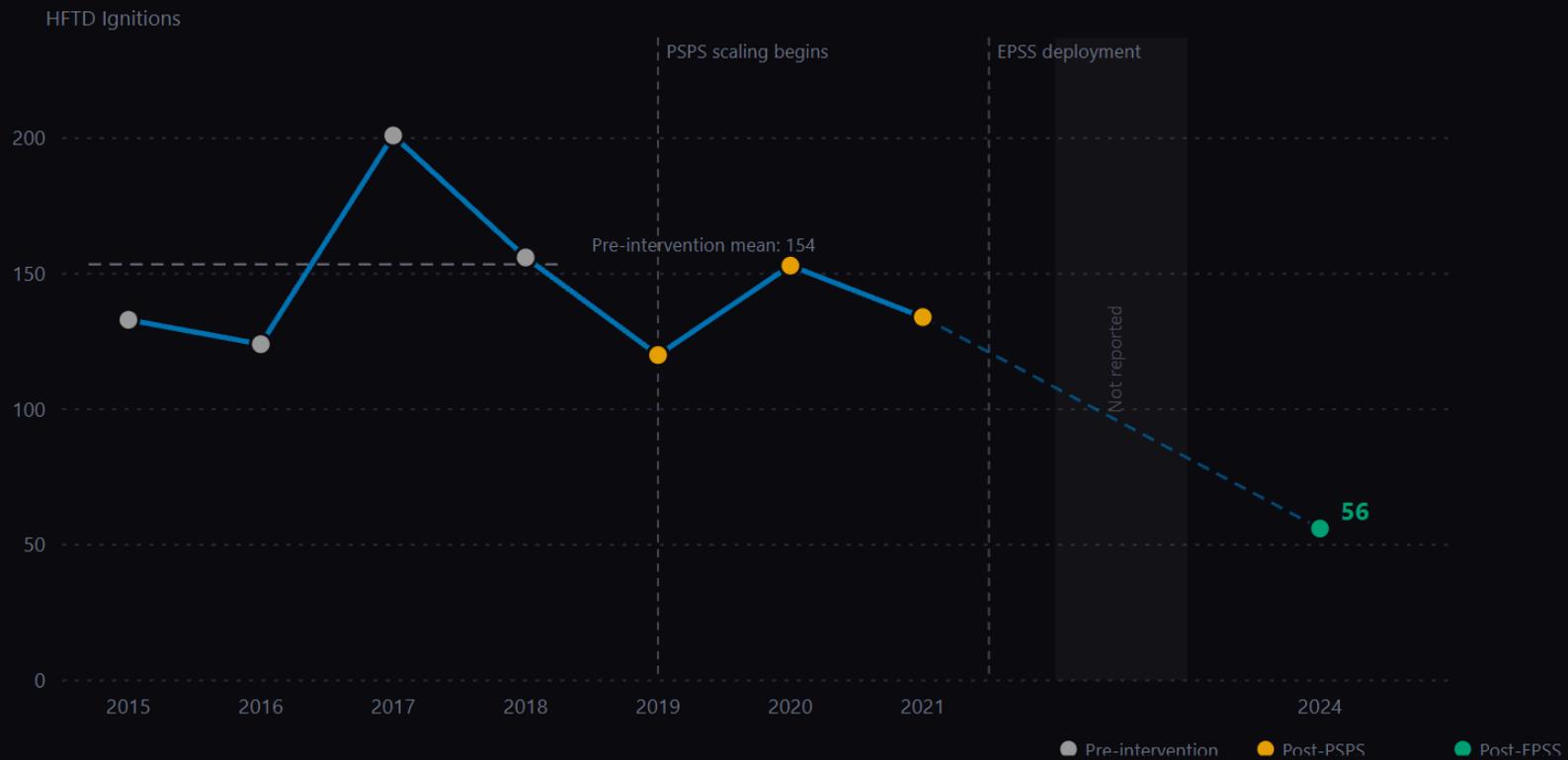


Why this matters: A 24-hour battery backup addresses only ~9% of actual medical baseline exposure. Programs targeting vulnerable populations should plan for 48–72 hour durations, not 24.

Medical baseline customer-hours by duration threshold. CPUC PSPS reporting data, 2019–2025.

Is PSPS Working? The Attribution Problem

PG&E ignitions in High Fire Threat Districts declined from a pre-intervention mean of 154 to 56 in 2024. But PSPS, EPSS, vegetation management, and equipment hardening were all deployed simultaneously — attributing the decline to any single intervention is not possible from trend data alone.



Why this matters: Multiple interventions together are working, but the relative contribution of each cannot be determined without causal identification. The question is not whether to keep PSPS — it is how to make it shorter, more targeted, and less frequent.

PG&E HFTD ignitions, 2015–2024. 2022–23 not reported. PSPS scaling began 2019; EPSS deployed 2021.

Key Takeaways

- 1 PSPS events are long.** Median 34 hours. 68% exceed 24 hours. This exceeds virtually all residential battery backup capacity, creating a 21-hour gap for the typical household.
- 2 The burden is extremely concentrated.** Gini 0.70. Just 394 chronic circuits (17%) account for 48% of all customer-hours. Targeted hardening of these circuits would have outsized impact.
- 3 Vulnerable populations bear disproportionate risk.** 91% of medical baseline customer exposure occurs during events longer than 24 hours. Current backup targets are structurally undersized.
- 4 PSPS works, but attribution is impossible.** Ignitions are declining, but multiple interventions were deployed simultaneously. The question is how to make PSPS shorter, more targeted, and less frequent.

Read the Full Analysis

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