



Public Safety Power Shutoffs in Wildfire Mitigation Plans

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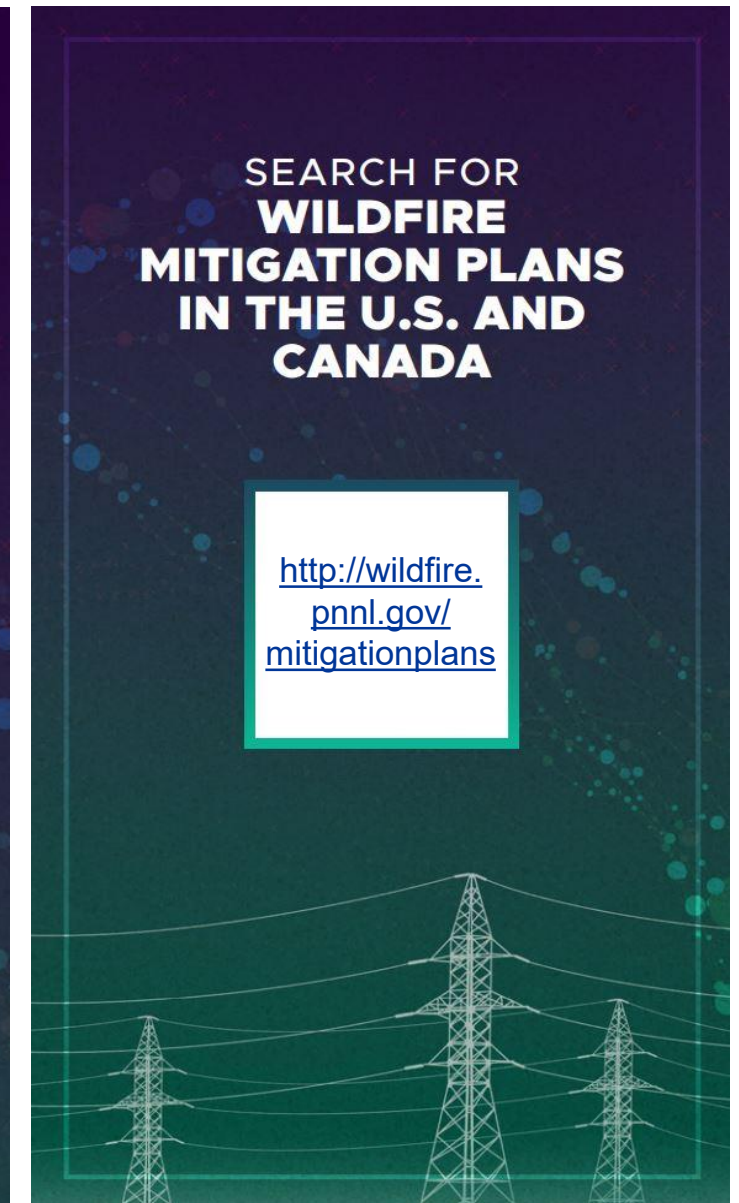
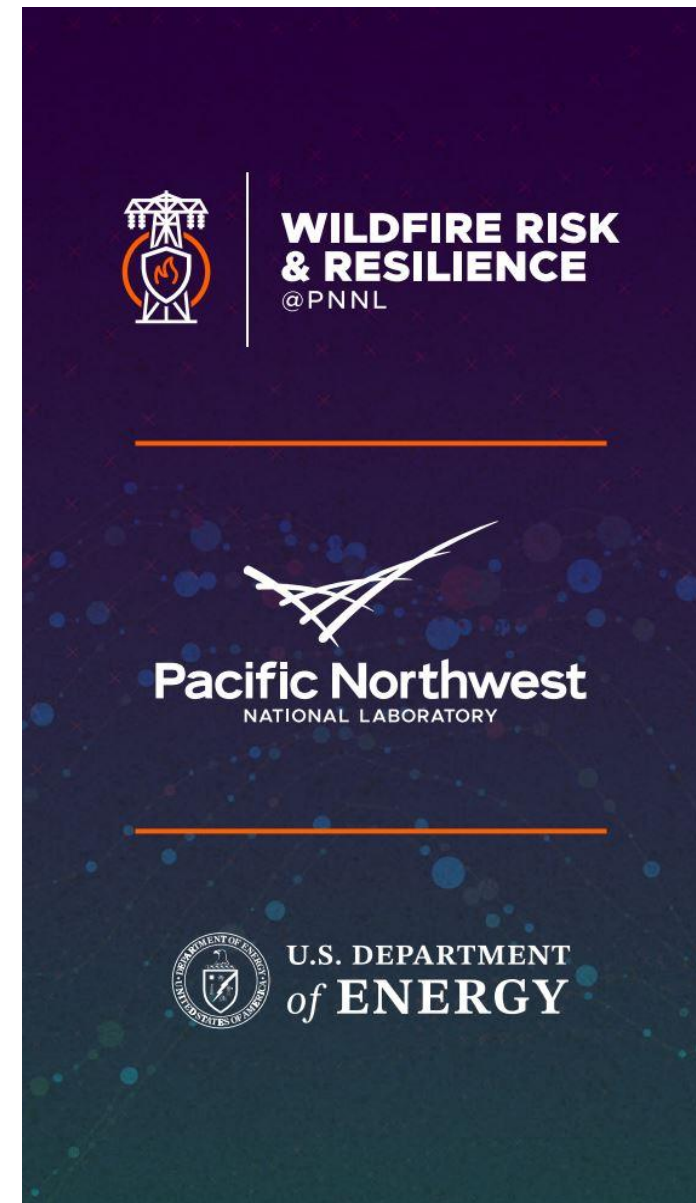
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**WILDFIRE RISK
& RESILIENCE**
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Background

- Sponsored by the U.S. Department of Energy's Office of Electricity, PNNL created a database of all known and discrete utility Wildfire Mitigation Plans (WMPs) from across the United States and Canada.
- The goal is to provide a single consolidated location for access to all WMPs. Plans are organized by various metadata:
 - Location of the authoring utility or entity
 - Year or range of years of the plan implementation period
 - Type of utility or entity
- The database is a component of a larger research program to establish credible industry metrics to assess and mitigate wildfire risk.
- To help make sense of hundreds of WMPs and their contexts, PNNL produced a series of citable short decks, organized by technical topics.



Public Safety Power Shutoff (PSPS)

- The North American Electric Reliability Corporation defines a Public Safety Power Shutoff (PSPS) as "the proactive de-energization of power lines that are forecasted to be in the path of critical fire weather conditions" to eliminate the possibility of ignition from the electric system.
- Implementation of PSPS is very disruptive to consumers, with de-energization typically lasting between 24 and 48 hours.* Because of this, PSPS is often considered a last resort action taken by utilities only if all other mitigation practices fail or are impractical to implement.
- Distribution lines are both more exposed to wildfire risk and less disruptive when de-energized than transmission. PSPS procedures for transmission exist, but implementation is exceedingly rare.



[Newsweek](#)

*Based on publicly available PSPS data from investor-owned utilities under the jurisdiction of the California Public Utilities Commission; see slide 13 for details.

Public Safety Power Shutoff (PSPS)

- PSPS was first approved as a mitigation strategy in California when San Diego Gas & Electric (SDG&E) obtained PUC approval in 2012 through [CPUC Decision 12-04-024](#).
- Now, 92 utilities with WMPs document PSPS protocols, with varying levels of detail. Of these utilities, at least 13 have implemented their PSPS protocols in an actual event.
- Thousands of circuits have been de-energized in California, and PSPS is being used by investor-owned utilities (IOUs) in other Western states. However, there is no comprehensive nationwide record of PSPS implementation.
- Among all wildfire mitigation tools, PSPS uniquely affects the practicing utility's customer safety, trust, and reliability.
- Events are high-profile, often controversial, and require significant regulatory oversight – therefore evaluating PSPS planning offers a lens into how utilities balance risk reduction with public disruption.

ALJ/TIM/avs

Date of Issuance 4/26/2012

Decision 12-04-024 April 19, 2012

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of San Diego Gas & Electric Company for Review of its Proactive De-Energization Measures and Approval of Proposed Tariff Revisions (U902E).

Application 08-12-021
(Filed December 22, 2008)

**DECISION GRANTING PETITION TO MODIFY DECISION 09-09-030
AND ADOPTING FIRE SAFETY REQUIREMENTS
FOR SAN DIEGO GAS & ELECTRIC COMPANY**

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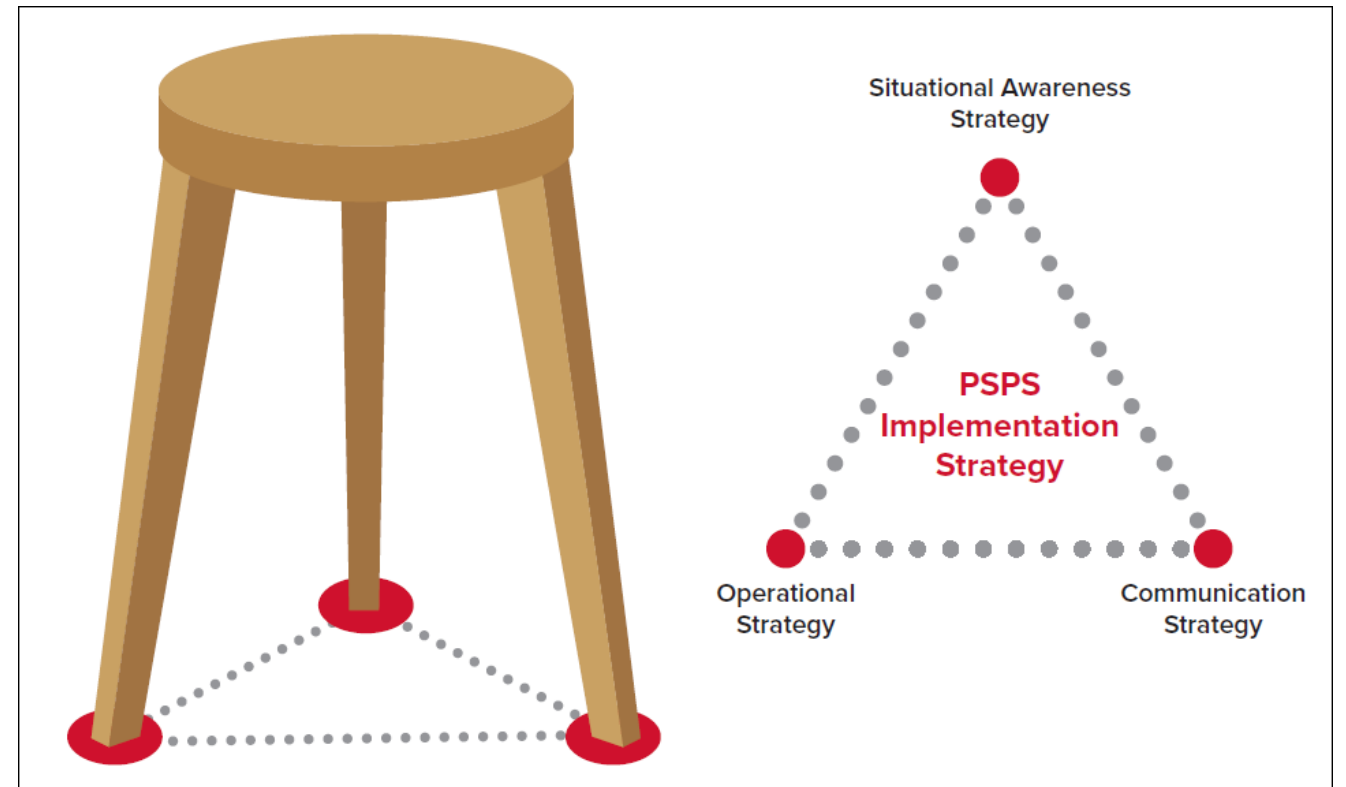
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Utility PSPS Protocols in WMPs

There is no ‘one-size-fits-all’ protocol.

- Many WMPs have no PSPS content at all, either because they do not implement PSPS, or because it is not a requirement in every jurisdiction.
- Several include boilerplate language which describes PSPS capabilities in broad terms and notes its viability as a tool of “last resort.”* This language generally follows protocols established by IOUs in CPUC jurisdiction.
- Some contain detailed, utility-specific PSPS protocols, especially large IOUs, such as PG&E, Xcel Energy, and NorthWestern Energy.

* Source: City of Ashland, 2022



Source: [NorthWestern Energy Wildfire Mitigation Plan, 2024](#)

NorthWestern Energy and other utilities have detailed strategies for implementing PSPS, typically involving some combination of situational awareness, operational practices, and communications. These strategies are outlined in the following slides.

Common Themes in PSPS Protocols

- PSPS is viewed by utilities as a preventive measure to be deployed during extreme fire weather conditions, often as a last resort
 - Case-by-case decision-making is emphasized as the prevalent factor for calling events, and events are often coordinated with emergency agencies.
- Utilities consistently highlight the risk tradeoff between wildfire ignition prevention and the societal impacts of power outages.
 - The cascading impacts of electricity disruptions on interdependent critical services are significant – this includes fire response, water supply, emergency communications, and medical needs.
 - Broad community disruption is acknowledged, as events affect infrastructure, traffic, fuel access, and local economies (especially vulnerable populations).
- Many utilities note that PSPS is a tool for them to address low-probability, high-consequence scenarios, and the risks of implementation often heavily outweigh the chances of its distribution system igniting a wildfire.

Process for Triggering PSPS

- Typically, utilities employ weather models as part of their situational awareness strategy to assess fire risk, often incorporating forecasted wind speeds, fuel moisture variables, and National Weather Service Red Flag Warnings as key decision-making inputs.
- Utilities also rely on quantifying risk through metrics such as the USGS Wildland Fire Potential Index (WFPI) or Santa Ana Wind Threat Index (SAWTI).
 - Although the calculation methods utilized as part of the WFPI vary between utilities (custom calibration is frequently applied based on local weather conditions, topography, and real-time wind speed data), it's a near-universal metric used to identify circuits at high risk for ignition.
 - SAWTI is a model developed by the U.S. Forest Service and University of California, Los Angeles, and it mainly targets the Santa Ana winds that affect Southern California.



**RED FLAG
WARNINGS**



**SANTA ANA
OR HIGH
WINDS**



**LOW
HUMIDITY**



**DRY
VEGETATION**
that could serve
as fuel



**FIRE
THREAT**
to electric
infrastructure



**ON-THE-
GROUND
OBSERVATIONS**



**PUBLIC
SAFETY
RISK**

PSPS Trigger Process Categorization

Generally, a utility's thresholds for deploying PSPS fall into one of six categories based on descriptions in Wildfire Mitigation Plans:

Fire-Weather Based: Triggering an event predominantly relies on thresholds associated with direct weather observation or fire danger conditions, such as wind speed, temperature, humidity, and/or Red Flag Warnings.

Modeling or Index Based: Triggers are determined using thresholds derived from fire models, forecast tools, or risk indices.

Tiering Based: Triggers rely on the presence of geographic wildfire risk designations, such as CPUC Fire-Threat District Tiers (Tier 2 or Tier 3) or other utility-defined "PSPS Zones", and an event is considered or automatically triggered when potentially affected infrastructure is located within these predefined high-risk areas.

Multi-Factor: Thresholds are a combination of various conditions such as modeling, weather, or field observations and are generally more operationally integrated.

No Trigger Defined: No specific thresholds are defined for triggering a PSPS event.

Unspecified: While the utility has a PSPS protocol in place, the conditional thresholds associated with triggering a PSPS event are not detailed.

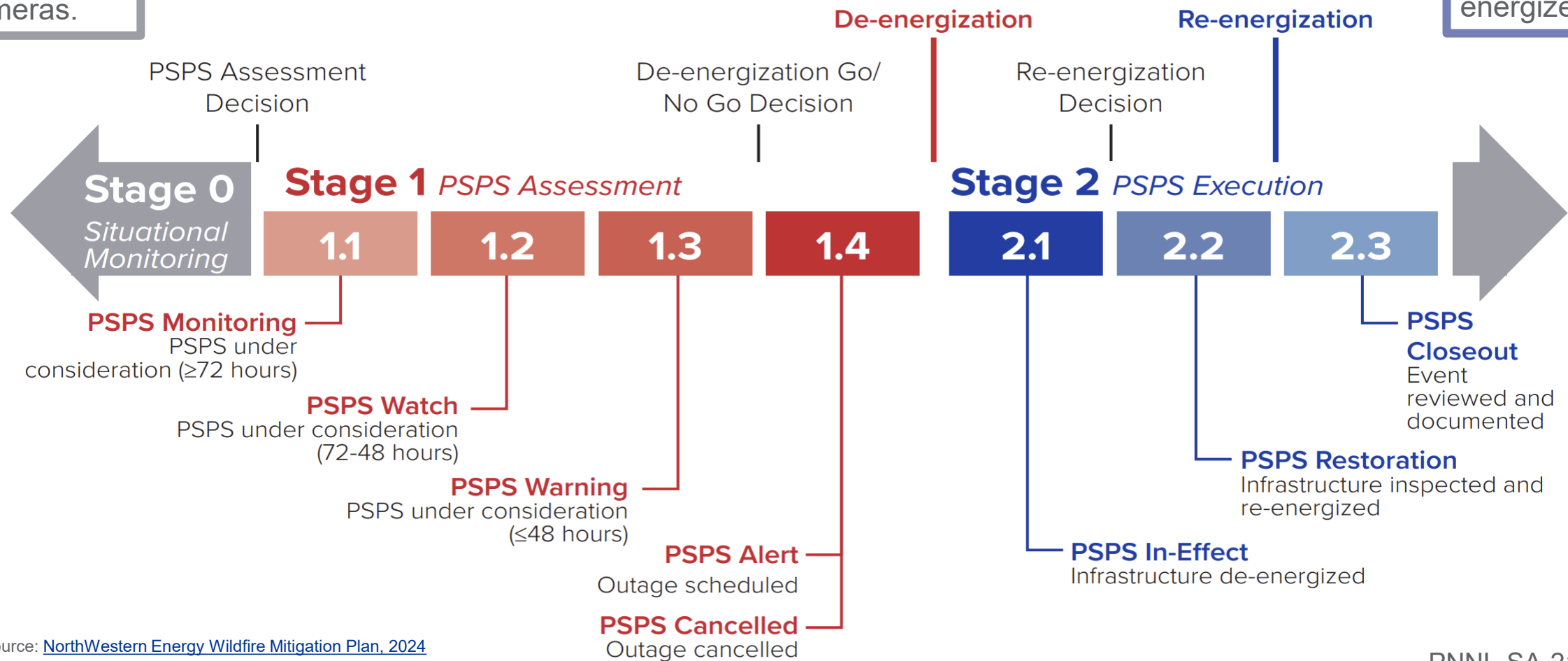
PSPS Implementation Procedure

All PSPS implementation starts with situational awareness, often with the use of models, weather data, or AI-assisted cameras.

Utilities with PSPS policies outline efforts to communicate PSPS events ahead of time and often offer community resource centers for affected customers.

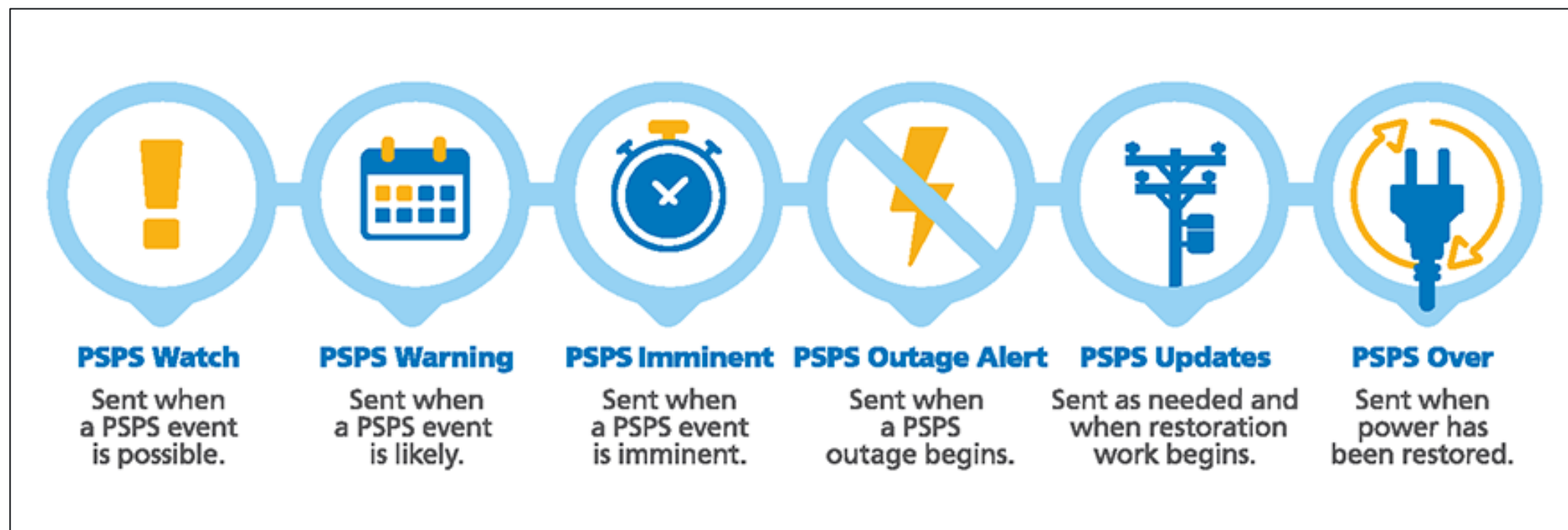
Because de-energization can have severe impacts on medical baseline customers, WMPs prioritize mitigation efforts to avoid shutoffs to certain critical infrastructure.

All affected power lines need to be individually inspected after each PSPS event is over before they can be re-energized.



Communication and Customer Outreach

- Utility customers are generally notified 24 to 96 hours prior to a PSPS event, when possible, via email, voice calls and/or SMS ([SCE, 2023-2025](#), p. 626); ([PacifiCorp, 2023-2025](#), p.320); ([RMP, 2024-2025](#), p. 67).
- Customers with medical or access and functional needs are prioritized for notifications, often via outbound live agent calls ([PacifiCorp, 2023-2025](#), p.309); ([RMP, 2024-2025](#), p. 66); ([Xcel PSC of CO, 2025-2027](#), p. 91).



Communication and Customer Outreach

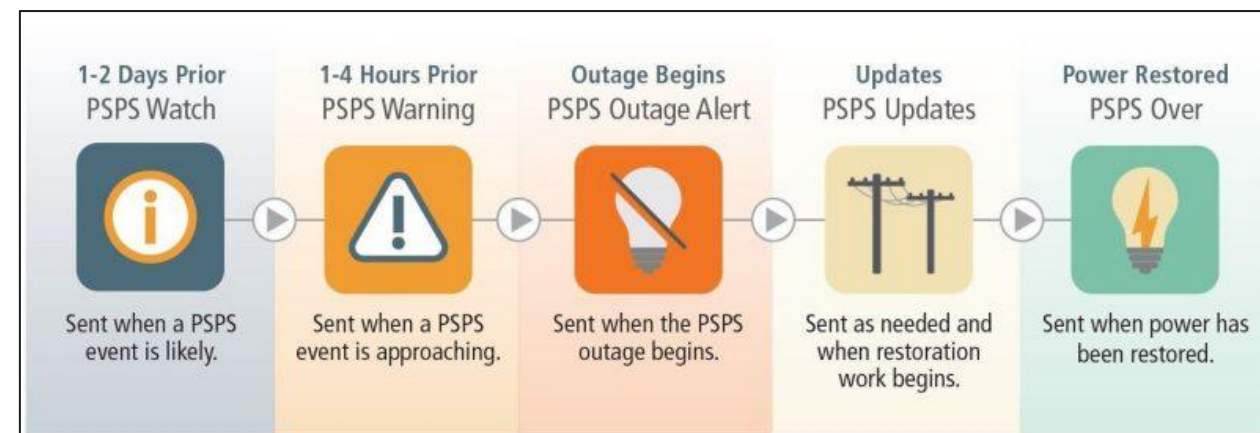


Source: [APU 2024, pg. 46](#)

- Up-to-date event information can also be found on most provider's websites and social media ([SCE, 2023-2025](#), p. 588); ([PacifiCorp, 2025](#), p.35); (PacifiCorp, 2023-2025, p.320); ([RMP, 2024-2025](#), p. 67).
- Public safety partners across local government, emergency management agencies, and other critical facilities and partners are notified 48-72 hours prior to a PSPS event when possible ([SCE, 2023-2025](#), p. 851); ([PG&E, 2023-2025](#), p. 852); ([RMP, 2024-2025](#), p. 67); ([Xcel PSC of CO, 2025-2027](#), p. 92).

PSPS Event Reporting Data Availability

- Due to differential reporting requirements, the availability of PSPS statistics and other information varies between jurisdictions, but at least 15 utilities are known to have implemented an actual PSPS event
- Few annual WMP updates document past PSPS events directly
 - Some utilities do provide generalized PSPS event summaries on their public website, but these are not exhaustive records of all PSPS implementation to date
 - As such, evidence for events can typically only be found through media coverage
- While some public utility commissions – **California, Oregon, and Nevada** – have codified requirements to ensure PSPS event recording, most do not



Source: [Idaho Power](#)

PSPS Event Reporting Data Availability

California

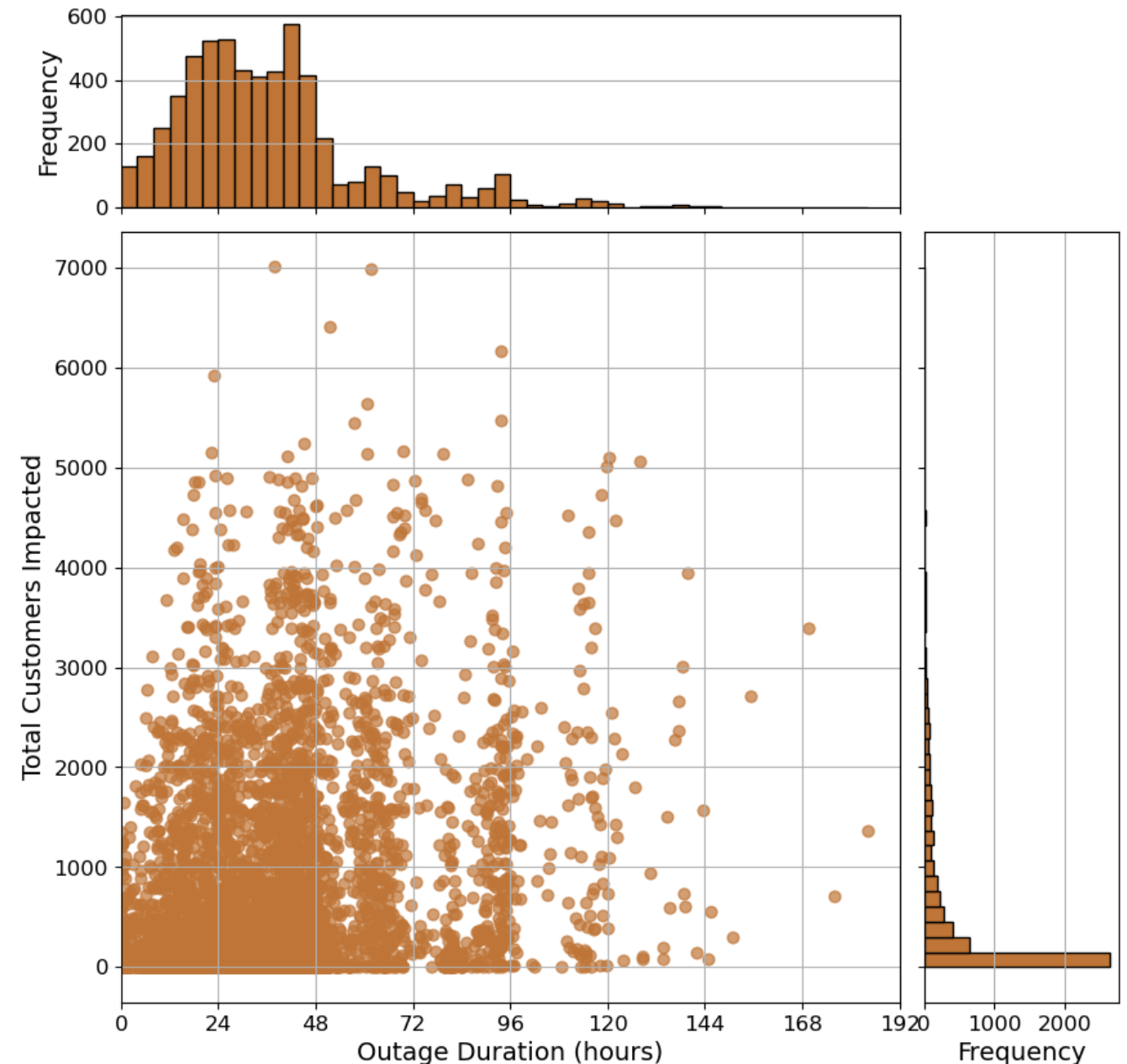
- In California, [CPUC Resolution ESRB-8 \(2018\)](#) defines specific notification, reporting, and mitigation parameters for regulated IOUs governed by the California Public Utilities Commission (CPUC).
- California is the only state which maintains a publicly-accessible [database](#) (all events 2013–present) and interactive [dashboard](#) (events since 2018) of PSPS events implemented in IOU service territories.
- Since October 2013, there have been 6,375 circuits de-energized – over 62% of which have occurred since 2020 – resulting in de-energizations for 4,477,024* CPUC customers (of 12,687,361* notified).

* Via reporting since 2018; not unique customers, as individual customers could have been affected by multiple events.

PSPS Event Reporting Data Availability

California

- Since 2013, most events lasted less than 48 hours, with 32% of events lasting less than 24 hours, and an additional 49% lasting between 24 and 48 hours.
- Long-duration events (greater than 48 hours) tend to affect smaller, likely rural, customer bases.
- 92 circuit de-energizations (1.4%) are reported to have impacted zero customers.



PSPS Event Reporting Data Availability

Oregon

- In Oregon, [OAR 860-024-0160 \(2021\)](#) outlines reporting requirements for IOUs regulated under the Oregon Public Utilities Commission (OPUC) associated with documenting PSPS events.
- Under OPUC's requirements, non-confidential versions of PSPS reports must be publicly accessible and obtainable through [dockets](#), filings, or requests.
 - Utilities must document why a PSPS event was initiated, including the fire-weather conditions, risk assessments, alternatives considered, and how the benefits of de-energization were determined to outweigh the risks.
 - Utilities must also report the scope and duration, number of customers affected, re-energization procedures and timelines, and any lessons learned following the event.
- Since 2022, there have been three events resulting in de-energizations, affecting 55,832 customers within territory regulated by the OPUC.

PSPS Event Reporting Data Availability

Nevada

- Nevada refers to PSPS as *PSOM (Public Safety Outage Mitigation)*.
- In Nevada, [LCB File No. R085-19](#) outlines reporting requirements for IOUs regulated under the Public Utilities Commission of Nevada (PUCN) associated with reporting requirements related to fires, natural disasters, and public safety events, including outages initiated to preserve public safety.
- Rather than a direct reporting rule for PSPS/PSOM as with CPUC and OPUC, LCB File No. R085-19 is a regulatory vehicle that requires utilities to include de-energization protocols and related reporting for natural disasters.
- Since 2020, there have been 11 events (all by NV Energy and between 2020 and 2022) affecting customers, resulting in de-energizations for 5,010 customers within territory regulated by the PUCN.

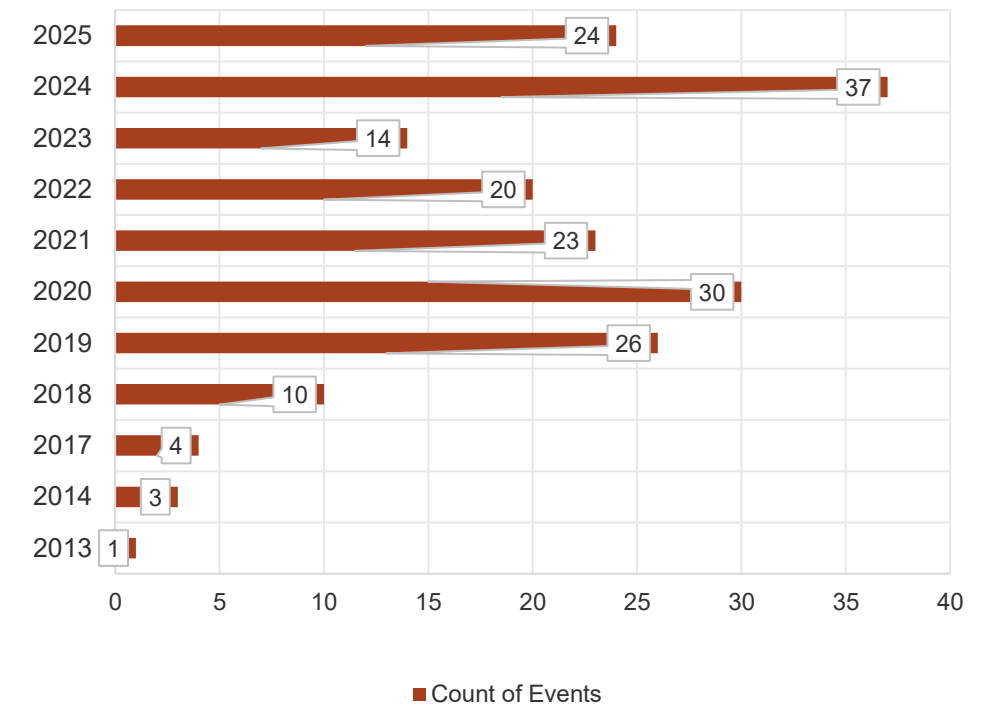
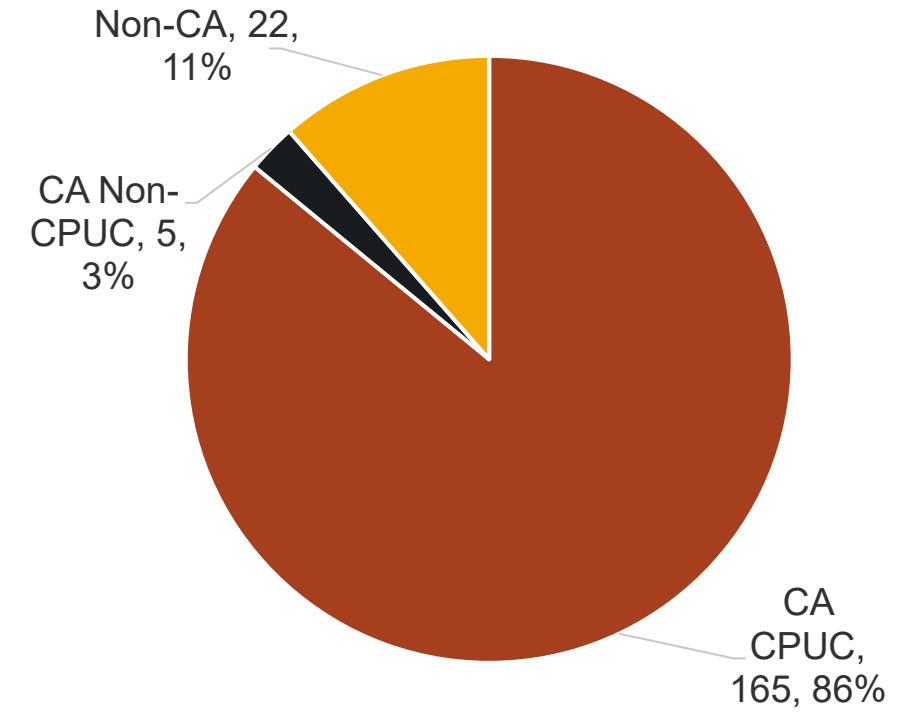
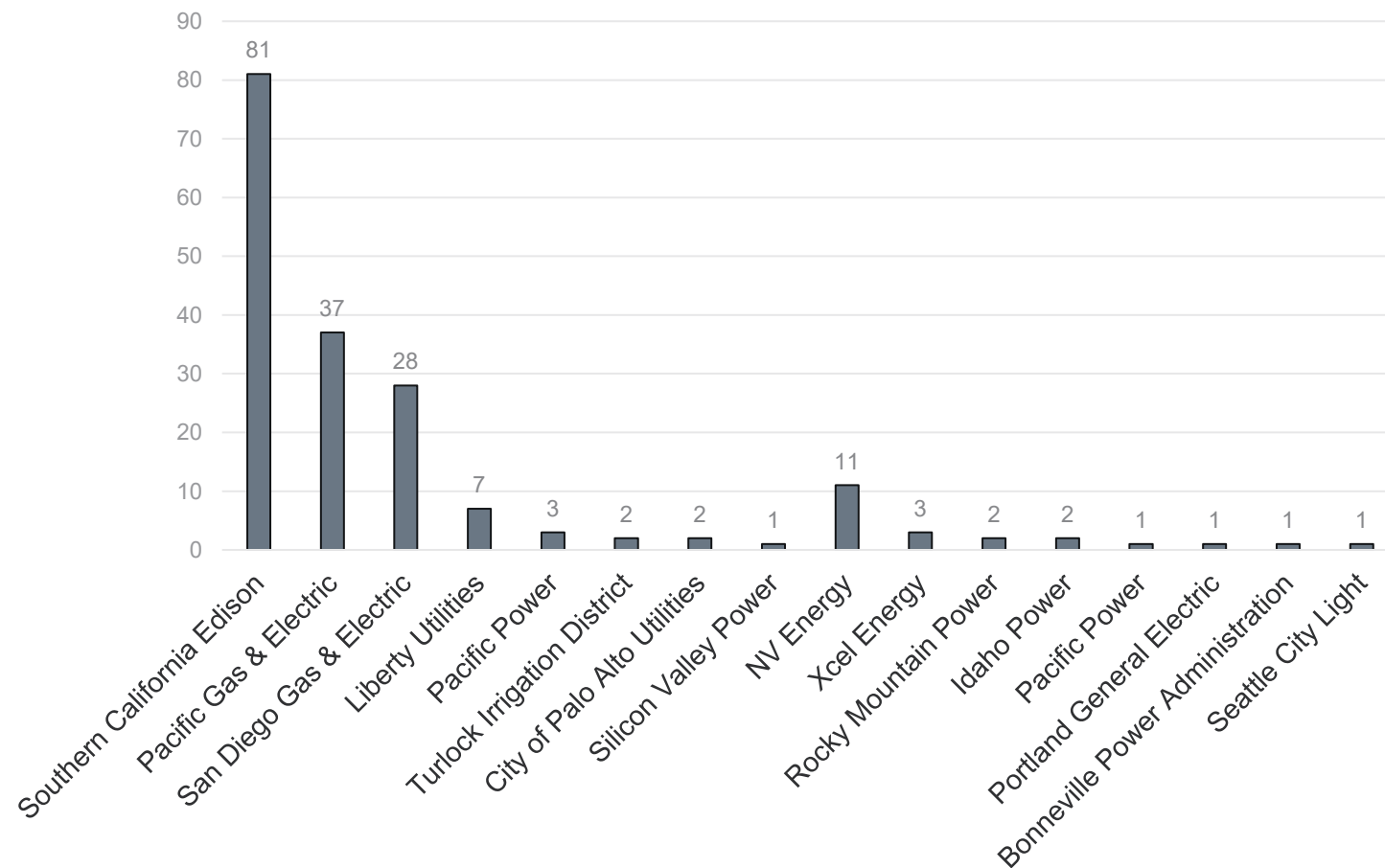
PSPS Event Reporting Data Availability

- Availability of known PSPS events outside of CPUC, OPUC, or PUCN’s jurisdiction is limited and typically only found via company website, media, or WMPs.
- Below is a table of known non-CPUC/OPUC/PUCN PSPS events since 2020:

Utility	Events	State	Year	Source
Turlock Irrigation District	2	CA	2020	2024 WMP
Silicon Valley Power	1	CA	2020	2023 WMP
City of Palo Alto	1	CA	2021	2022 WMP
City of Palo Alto	1	CA	2022	2023 WMP
Bonneville Power Authority	1	WA	2022	Local Media
Rocky Mountain Power	1	UT	2022	IOU Website
Seattle City Light	1	WA	2023	2024 WMP
Xcel Energy	1	CO	2024	IOU Website
Idaho Power	1	ID	2024	2025 WMP
Rocky Mountain Power	1	UT	2025	IOU Website
Xcel Energy	2	CO	2025	PUC Website

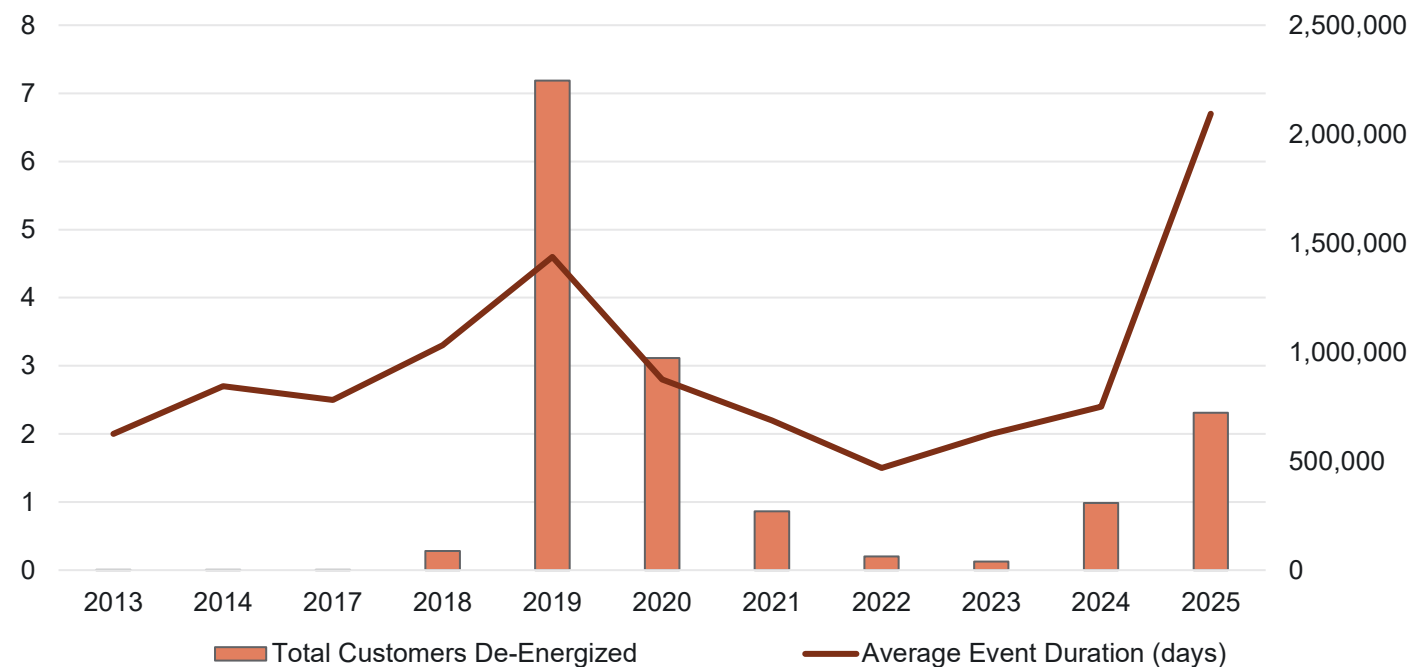
Events Summary

- How many events have been called?
 - 192 total since 2013, the vast majority (165) by CPUC IOUs



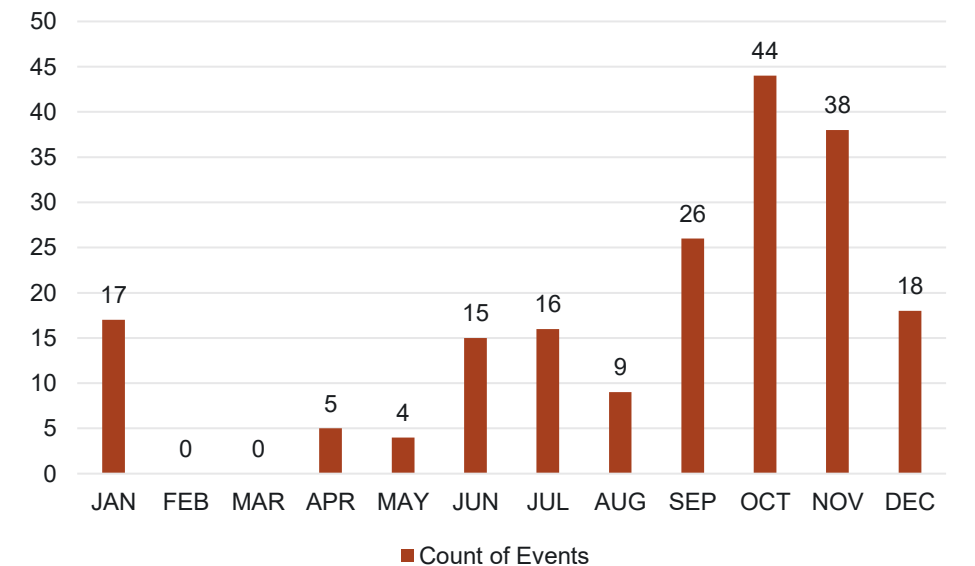
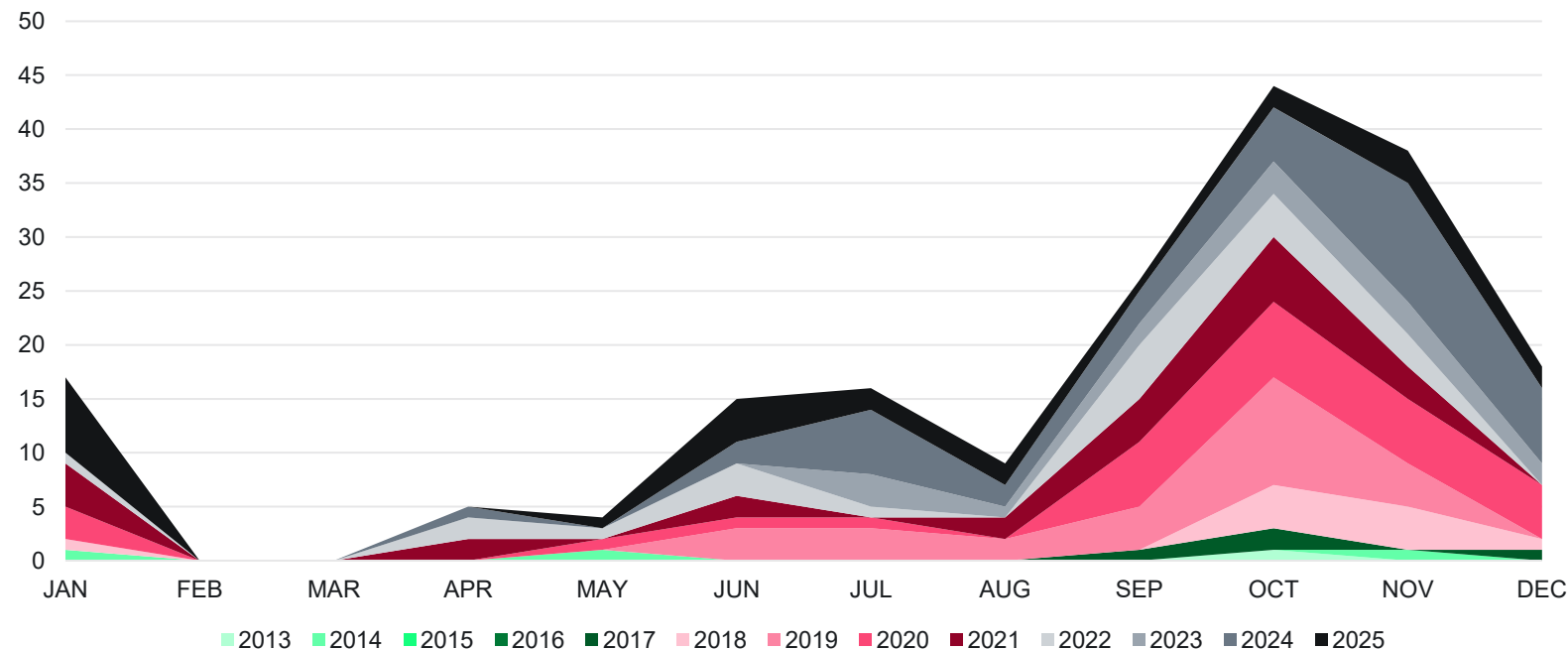
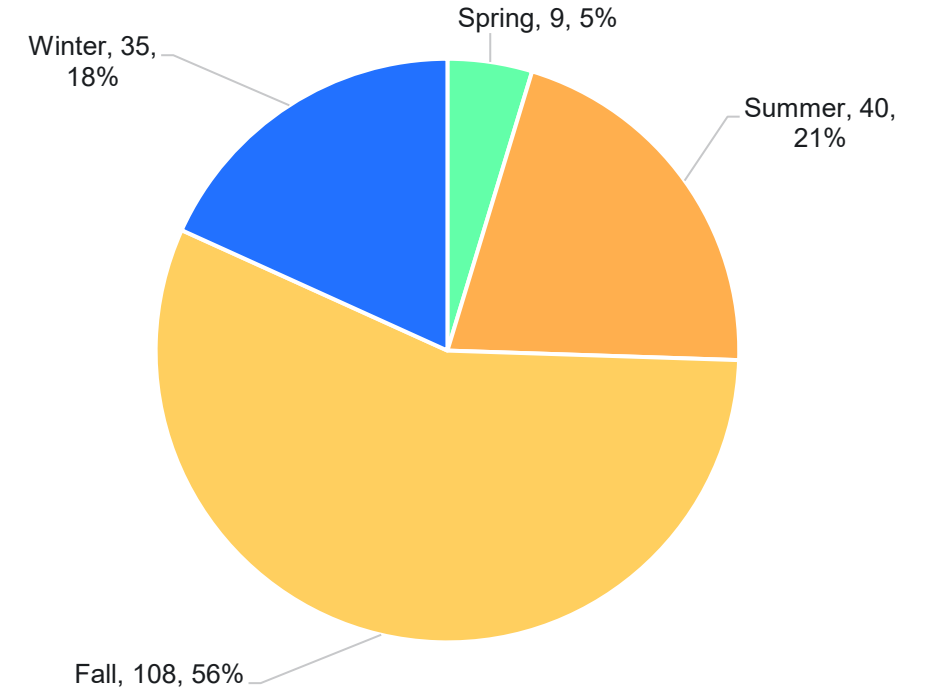
Events Summary

- **What kind of impacts have the events had?**
 - PSPS use has expanded since its inception, evolving from isolated early events into a more routinized wildfire mitigation tool used by a growing number of utilities.
 - Event durations had a notable uptick in 2025, likely driven by more cautious decision-making under heightened regulatory/public scrutiny and system redundancy implementations.
 - 2019 represented a clear inflection point driven primarily by Kincadee Fire in October in PG&E's territory, as the cause was directly linked to transmission infrastructure.



Events Summary

- **When are the events taking place?**
 - Most events (56%) occur in the fall, with the majority in October – this aligns with Diablo and Santa Ana wind events and significantly lower relative humidities
 - Peak is in weeks 41-45 (~Oct/11 to Nov/14)

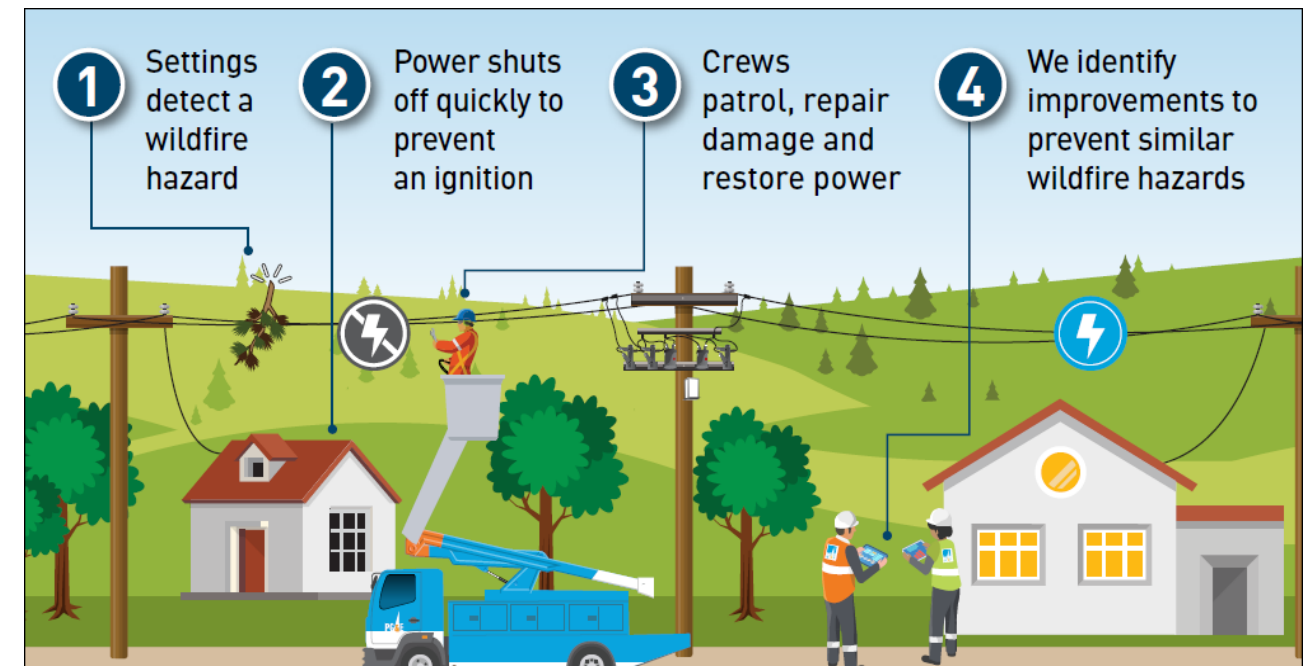


Case Studies in PSPS History

- Prior to 2024, Xcel Energy Public Service Company of Colorado did not have a PSPS plan in any of its WMPs. Following the Marshall Fire (December 2021 – January 2022), for which Xcel was found to be partially liable, Xcel Colorado began including a PSPS plan in all WMPs ([Xcel Energy PSCO, 2025-2027](#)).
- Similarly, Hawaiian Electric Company (HECO) had not published any WMP before the Lahaina Fire (August 2023), the ignition of which was found to be the premature re-energization of a downed HECO power line. Both WMPs published after the fire include detailed PSPS plans ([HECO, 2024](#)).
- Despite having a PSPS plan in every WMP published since 2019, PacifiCorp did not implement PSPS during the Labor Day Fires in Oregon (September 2020) ([PacifiCorp, 2025](#)).
- Risk reduction from successful implementation of PSPS is difficult to quantify, but post-event inspections identifying damaged and destroyed assets validate the value of PSPS as a tool to avoid large wildfires ([PG&E, 2021](#)). The value of avoided risk compared to the cost of disruptions due to de-energizations remains uncertain and merits further study.

Enhanced Powerline Safety Settings (EPSS)

- Unlike PSPS, which requires manual decision-making by operators, EPSS automatically de-energizes lines based on real-time fault detection.
- EPSS is often referred to as “PSPS-Lite” or a “Pre-PSPS” strategy by targeting localized risk without the broader disruption of full shutoffs.
- Piloted by PG&E in High Fire Threat Districts (HFTDs), EPSS has since been adopted by other CPUC-regulated IOUs and is now more widely implemented.
- EPSS uses reclosers set to “fast-trip,” cutting power within ~0.1 seconds after a fault is detected with one shot to lockout and no automatic reclosing.



Source: Pacific Gas & Electric, 2025

Enhanced Powerline Safety Settings (EPSS)

- Unlike PSPS, EPSS events occur automatically and instantaneously in response to detected faults – therefore advance notice to customers is not only not required, but also not possible to implement.
 - For CPUC IOUS, utilities must report EPSS deployment and impacts in WMPs
 - Pacific Gas & Electric (PG&E) noted that EPSS implementation was associated with a ~65 % reduction in ignitions on EPSS-enabled powerlines in 2024
- As utilities continue refining their wildfire strategies, EPSS reflects a broader shift toward automation, precision, and layered mitigation to complement the role of PPS in extreme conditions.



Source: Avista Utilities, 2025

Citation, Contacts, and Project Links

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<https://wildfire.pnnl.gov/mitigationPlans/pages/analysis>

For more information,
contact wildfire@pnnl.gov

All WMPs used in this analysis can be found at:

<https://wildfire.pnnl.gov/MitigationPlans>



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Thank you