Pacific Gas and Electric Company

California Public Utilities Commission Annual Public Safety and Public Safety Power Shutoff Briefing

August 19, 2025

Topics for Discussion

1. Safety Governance
2. Workforce Safety
3. Layers of Wildfire Protection Approach and Risk Modeling
4. Operational Mitigations and Community Engagement and Support
5. Benchmarking and Lessons Learned

PG&E Participants

Cheryl F. Campbell
Chair, Pacific Gas and Electric Company Board of Directors and Chair, Safety and Nuclear Oversight Committee

Sumeet Singh
Executive Vice President, Operations and Chief Operating Officer

Mark Quinlan
Senior Vice President, Wildfire, Emergency and Operations

Matt Hayes
Vice President, Enterprise Health and Safety and Chief Safety Officer

Safety Governance

Safety Governance

Safety governance is embedded at the highest levels of the company, with direct involvement from the Board of Directors and the Safety and Nuclear Oversight (SNO) Committee.

Board of Directors

13 independent members

- Supports and approves oversight of safety metrics tied to executive compensation
- Reviews annual performance
- Incorporates new talent and fresh perspectives

We have consistently maintained our governance structure since successfully standing it up in 2021

SNO Committee

Six independent members

- Committee members share more than 100 years of Safety Governance experience
- Reviews safety, risk and operational performance and results of cause evaluations
- Provides feedback to our management for action
- Deep expertise in wildfire safety, prevention, mitigation, emergency response and management, workforce and public safety, natural gas systems, risk management, cyber security and nuclear and non-nuclear generation safety

Workforce Safety

Safety Culture and Performance Metrics

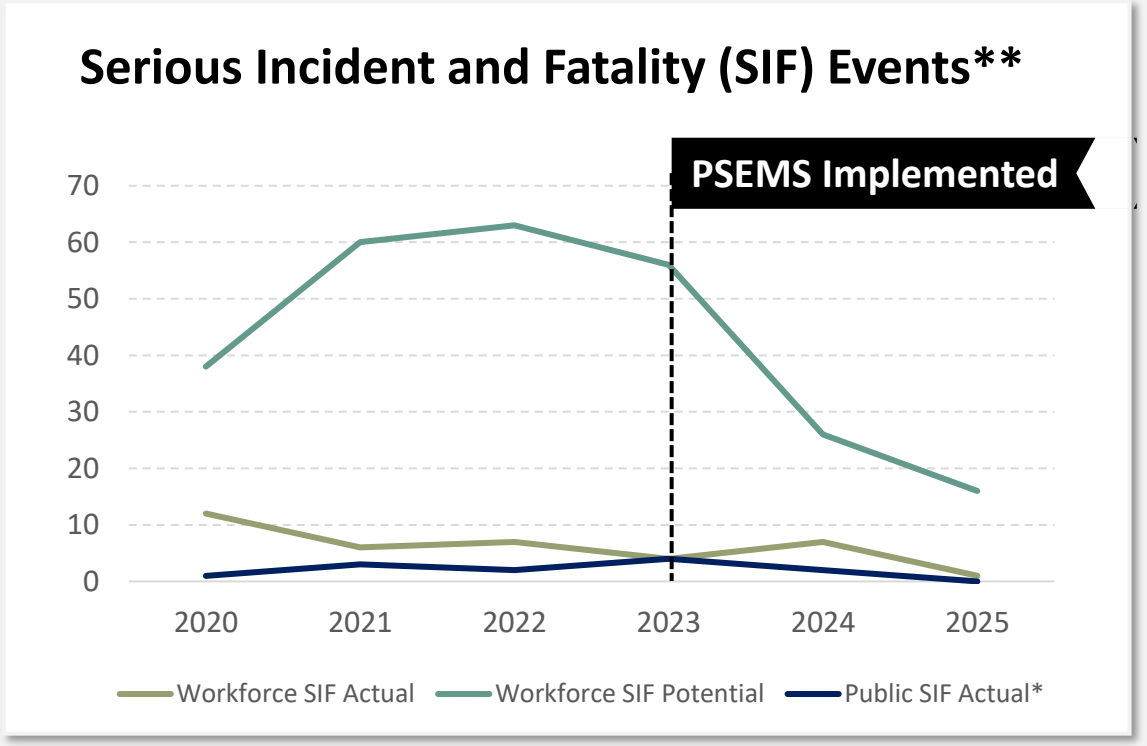
We have redefined safety by ensuring controls are always present, allowing us to fail safely. Our Safety Management System ensures we achieve that goal through culture, tools and standards.

Our Safety Management System drives down serious safety incidents

Human Performance Tools
Reduces individual errors and manages defenses

PG&E Safety Excellence Management System (PSEMS)
Provides standards for running our organization safely

Organizational Culture and Safety Mindset
Outlines safe behaviors and expectations for our coworkers and contract partners



*Public SIF potential events not tracked

*** Data as of 7/14/2025.*
Starting in mid-2020, contractors were required to report SIF-Potential events. SIF-Actual: A life-threatening or life-altering injury, or a fatality. SIF-Potential: An event that reasonably could have resulted in a SIF-Actual. Lower is better.

Safety Program Enhancements

We are improving safety for all coworkers to ensure everyone and everything is always safe.

Ongoing Safety Efforts

- **Beginning and ending with safety** through daily operating reviews, safety training and protocols
- **Providing live support during work** through the LiveSafe app, active supervisor engagement and corporate security presence
- **Learning from frontline coworkers** through Corrective Action Program, close call reporting and surveys

2025 Safety Innovations and Pilots

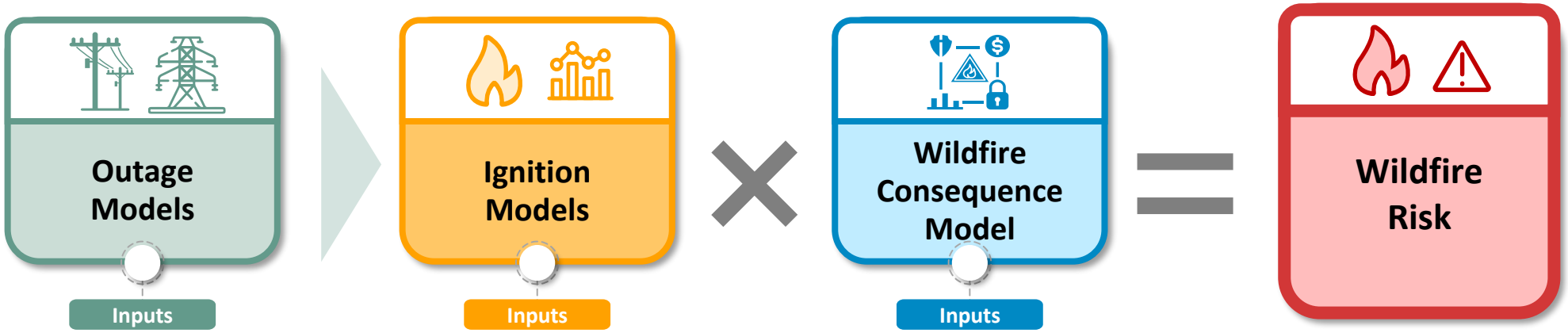
- ✓ **In-cab cameras in PG&E trucks** facilitating coaching and reducing distracted and fatigued driving
- ✓ **Lone worker safety technology** for isolated field roles with watch desk initiating check-ins if no GPS movement seen in an hour
- ✓ **Wearable heat sensors** that alert to approaching heat thresholds
- ✓ **Ballistic vests** for coworkers in high-risk environments
- ✓ **Safety culture mentors** for work areas with 2024 injury events
- ✓ **Critical Incident Stress Management** supporting workers experiencing a traumatic event in the field

Layers of Wildfire Protection

Using Our Wildfire Risk and Consequence Models

Our planning models allow us to prioritize new mitigations where risk is highest, accounting for both ignition probability and potential fire consequence.

HOW OUR RISK MODEL WORKS

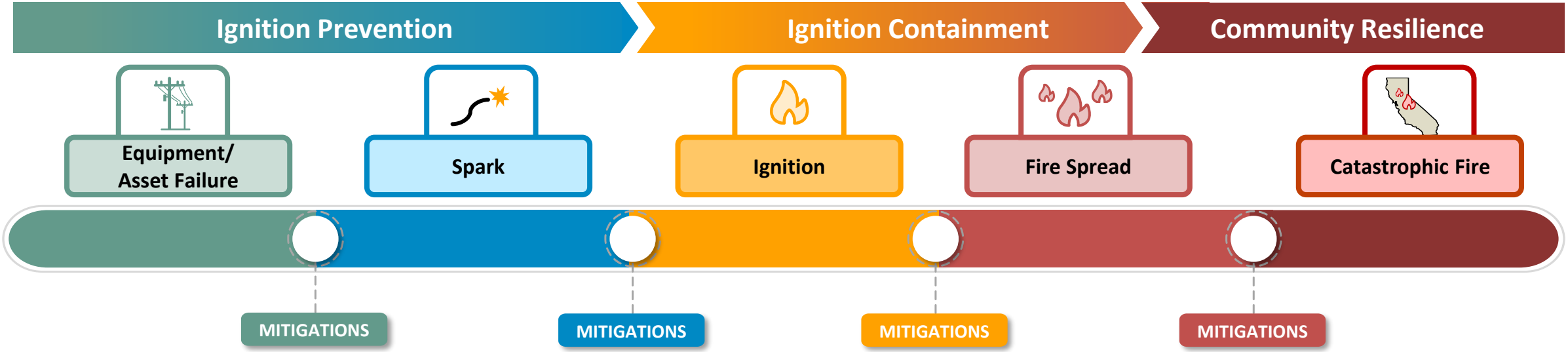


Wildfire DISTRIBUTION Risk Model v4	**Outage Models Incorporated** • Vegetation • Conductor • Support structure • Transformer • Voltage control • Animal • Third party	Incorporates the probability of an ignition resulting from an outage, by asset.
Wildfire TRANSMISSION Risk Model v2	**Hazard Model:** Likelihood and intensity of hazards (environmental, third party) **Fragility Model:** Conditional probability of failure given the intensity of a potential hazard	Hazard and Fragility models combine to create an **Annual Probability of Failure**. Outage (failure) model is used as proxy for ignition probability.

- **24-hour Fire Spread Simulation:** Improves on previous model's 8-hour simulation
- **Ingress:** Includes terrain difficulty adjustment to consequence
- **Egress:**
  - Adjusts estimated wildfire impacts based on local demographics
  - Incorporates 1,280+ years of combined firefighting knowledge shared by Public Safety Specialists and Safety Infrastructure and Protection Teams

Interrupting the Wildfire Sequence

Wildfires from electrical equipment follow a common sequence. Interrupting that sequence is key.



MITIGATIONS

- Public Safety Power Shutoff
- Distribution & Transmission Pole, Transmission Tower Clearing
- Undergrounding and System Hardening
- Asset Maintenance and/or Replacement
- Vegetation Management
- Real-Time and Continuous Monitoring

MITIGATIONS

- Enhanced Powerline Safety Settings
- Distribution & Transmission Pole, Transmission Tower Clearing

MITIGATIONS

- Enhanced Powerline Safety Settings
- Rapid Response Capability
- AI Wildfire Cameras

MITIGATIONS

- Hazard Awareness and Warning Center
- Rapid Response Capability
- Public Safety Specialist
- AI Wildfire Cameras
- Public-Private Partnerships
- Safety Infrastructure and Protection Teams

Wildfire Mitigation Progress and Innovation

Foundational Programs	2019-2025 Progress	
Undergrounding and System Upgrades*	**~10%** Of distribution lines in HFTD/HFRA upgraded/underground by EOY 2025	**2,502** Miles completed/ upgraded
Public Safety Power Shutoffs	**~98%** Decrease in number of customers impacted by PSPS outages in 2024 vs. 2019	
Enhanced Powerline Safety Settings	**100%** distribution line miles and customers in HFRA protected	**~47,000** Line miles and **~2M** customers protected
Vegetation Management	**31,110+** Line miles worked in HFTD/HFRA	
High-Definition Cameras	**94%** HFTD/HFRA covered	**678** Cameras installed
Weather Stations	**97%** HFTD/HFRA covered	**1,618** Stations installed

Enhanced Mitigation Efforts	Key Progress
Continuous Monitoring**	**~12,000** Devices deployed to date
Idle Line Mitigation	**19** Transmission lines mitigated or removed in 2025
Expanding PSPS	**Protecting** Non-tier HFTD buffer areas
Fuels Management	**1,462** Acres managed by 2025 EOY
Pole Clearing***	**~84,880** Distribution poles and transmission structures cleared in 2025

Ignition Prevention **Ignition Containment**

Community Resilience

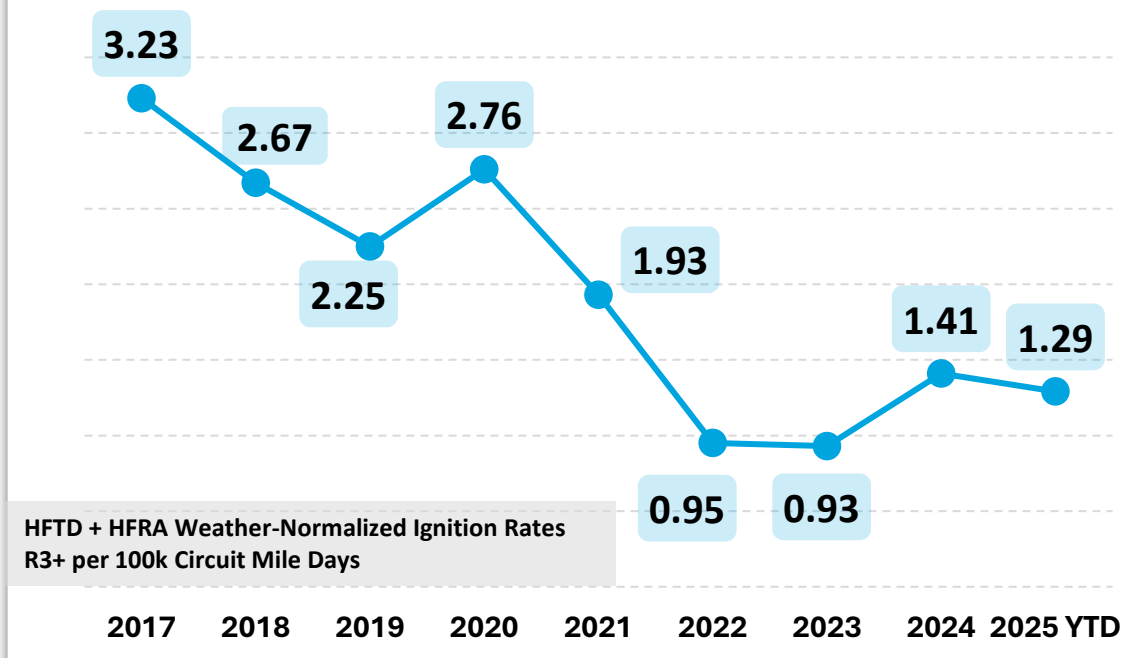
**The 10,000-Mile Undergrounding Program began in 2021, and 945 miles have been completed as part of that program. Totals include Butte Rebuild mileage. System upgrades include the installation of strengthened poles and covered powerlines and the removal of powerlines that were no longer needed. Total includes 16 system upgrade miles completed in 2018.*

***Gridscope devices, early fault detection sensors and distribution fault anticipators.*

****Includes enhanced efforts beyond compliance.*

Our Layers of Protection Continue To Reduce Fires Of Consequence

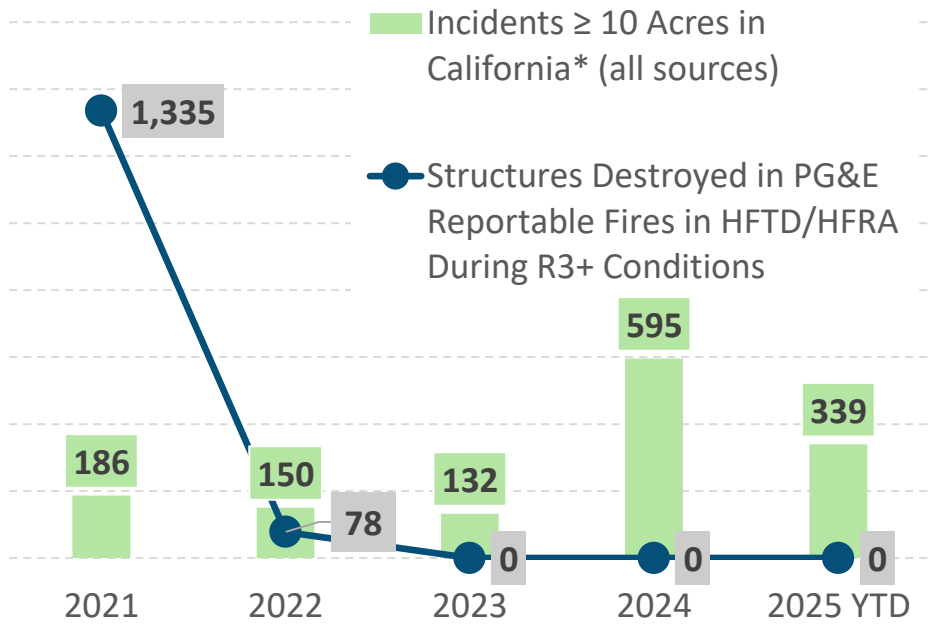
CPUC Weather-Normalized Ignition Rate**



2025 shows 365-day rolling as of 8/11/2025

EPSS Implemented Mid-2021

Fires Over 10 Acres and Structures Destroyed



**As reported by CAL FIRE as of 7/31/25*

***Reportable criteria includes any PG&E facility ignition that produces a self-propagating fire of material other than electrical and/or communication facilities, and that travels greater than one linear meter from the ignition point.*

Undergrounding and System Upgrade Project Selection

PG&E's project selection criteria has changed over recent years to align with a number of different regulatory processes.

In the 2023-2026 GRC period*:

- **PG&E selected work based on a combination of high-risk areas** (using wildfire risk models), local factors (such as tree-fallen risk, PSPS risk and ingress/egress risk) and feasibility.
- **PG&E adjusted the workplan** in response to the 2023 GRC decision.
- **PG&E is on track** to deliver the required 18% risk reduction.

Going forward for work completed in 2027 and beyond:

- PG&E will select work in the highest-risk areas based on the wildfire risk.
- From 2028, PG&E will also consider overall utility risk in project selection.
- The mitigation selected will be informed by the decision-tree and local factors, as well as an economic analysis (e.g. CBR and/or net benefit).
- The selected mitigation could include undergrounding, overhead hardening with EPSS, line removal** or a hybrid solution.

This period includes the first year of the 2026-2028 WMP.

***Line removal program includes remote grid and/or Line Elimination Incentive Program (LEIP).*

Example Undergrounding Cost Reduction Approaches

PG&E is committed to a declining unit cost for undergrounding.

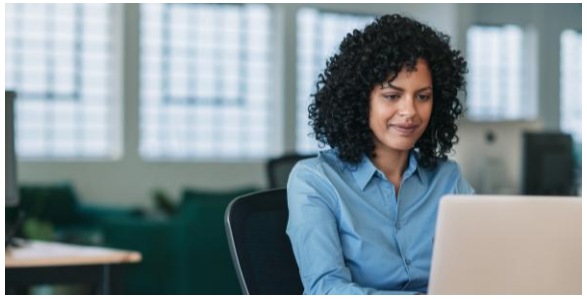
- In 2019, the unit cost was more than $4M per mile and the 2023 to 2024 average unit cost was $3.1M. PG&E continues to pursue innovations and efficiencies to reduce the unit cost.
- Achieving and maintaining these unit cost decreases will depend on a number of factors, including regulatory funding for enough undergrounding miles to sustain economies of scale.

Optimizing Design and Construction Standards

Improving Spoils Management and Sustainability

- Use of native backfill
- Local recycling programs
- Competitive contracting

Contract Pricing Approaches



- Lump sum pricing for projects

Evolving our Vegetation Management Practices

We continue to evolve our vegetation management practices to reduce vegetation safety risks while improving efficiency and customer affordability.

Adding Safety with EVM
2019-2022

We implemented our Enhanced Vegetation Management (EVM) program to further reduce wildfire risk by:

- **Meeting and exceeding state standards** for minimum clearances around powerlines
- **Addressing overhanging limbs and branches** directly above and around lines
- **Removing dead and dying trees** and assessing and mitigating trees that posed a potential threat to powerlines

Refining Targeted Work
2023-2025

Our transitional programs continue to address key vegetation-risk areas and supplement our annual work:

- Tree Removal Inventory (TRI)
- Focused Tree Inspections (FTI)
- VM for Operational Mitigations (VMOM)

~29% reduction in total spend

~56% reduction in vegetation-caused ignitions*

Comparing 2023-2025 versus 2019-2022

Increasing Efficiency and Customer Focus
2026-2028

Next year, we plan to consolidate our transitional programs into our annual and hazard patrol vegetation work to:

- Reduce frequency of visits to customer properties
- Increase operational efficiency
- Improve customer affordability

PROGRAMS	GOAL
Routine Inspection	**78,000+** miles inspected each year
Hazard Patrol Inspections	**10,000+** miles inspected each year

**CPUC-reportable vegetation-caused ignitions*

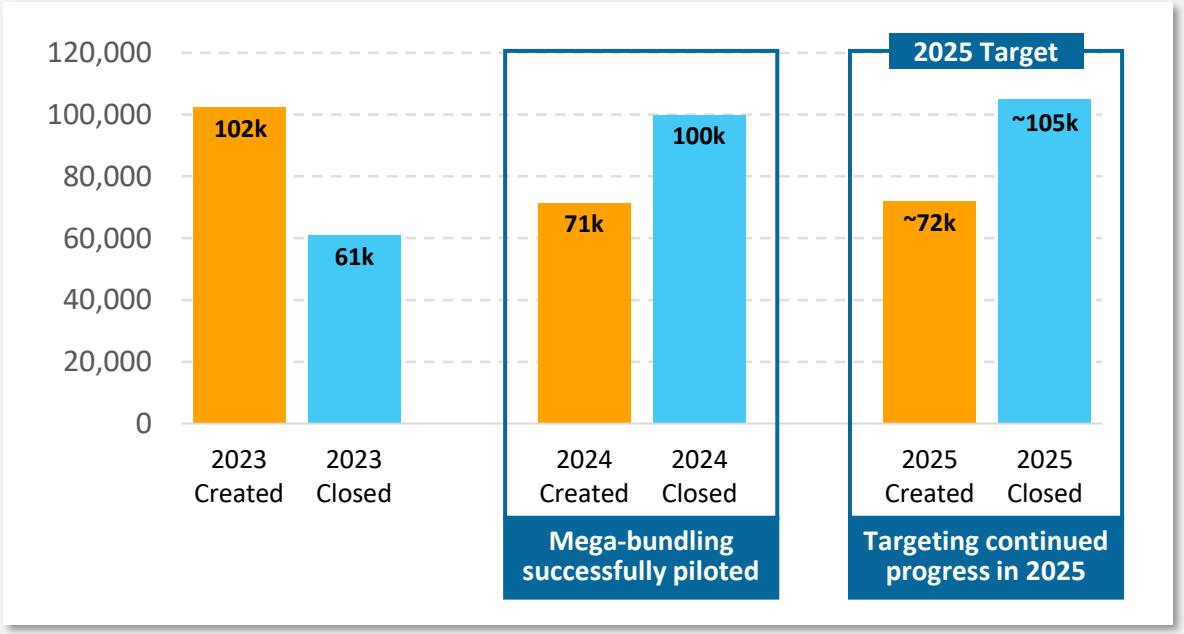
Addressing HFTD/HFRA Distribution Maintenance Tags

By addressing tags that contribute the most risk, we are effectively addressing wildfire risk while reducing open tags. Through our successful 2024 mega-bundling pilot, we closed more tags than we opened for the first time while improving work efficiency, reliability and cost effectiveness.

WHERE WE ARE

Closing More Than Creating

HFTD/HFRA Distribution Tag Progress



HOW WE GOT THERE

Mega-Bundling

Benefits of Mega-Bundling

~$68M in expected savings*

- Forecasted to save nearly 15 million customer minutes interrupted** from maintenance outages since pilot began
- Boosts affordability through work efficiency
- Improves coworker safety with fewer trips to complete maintenance

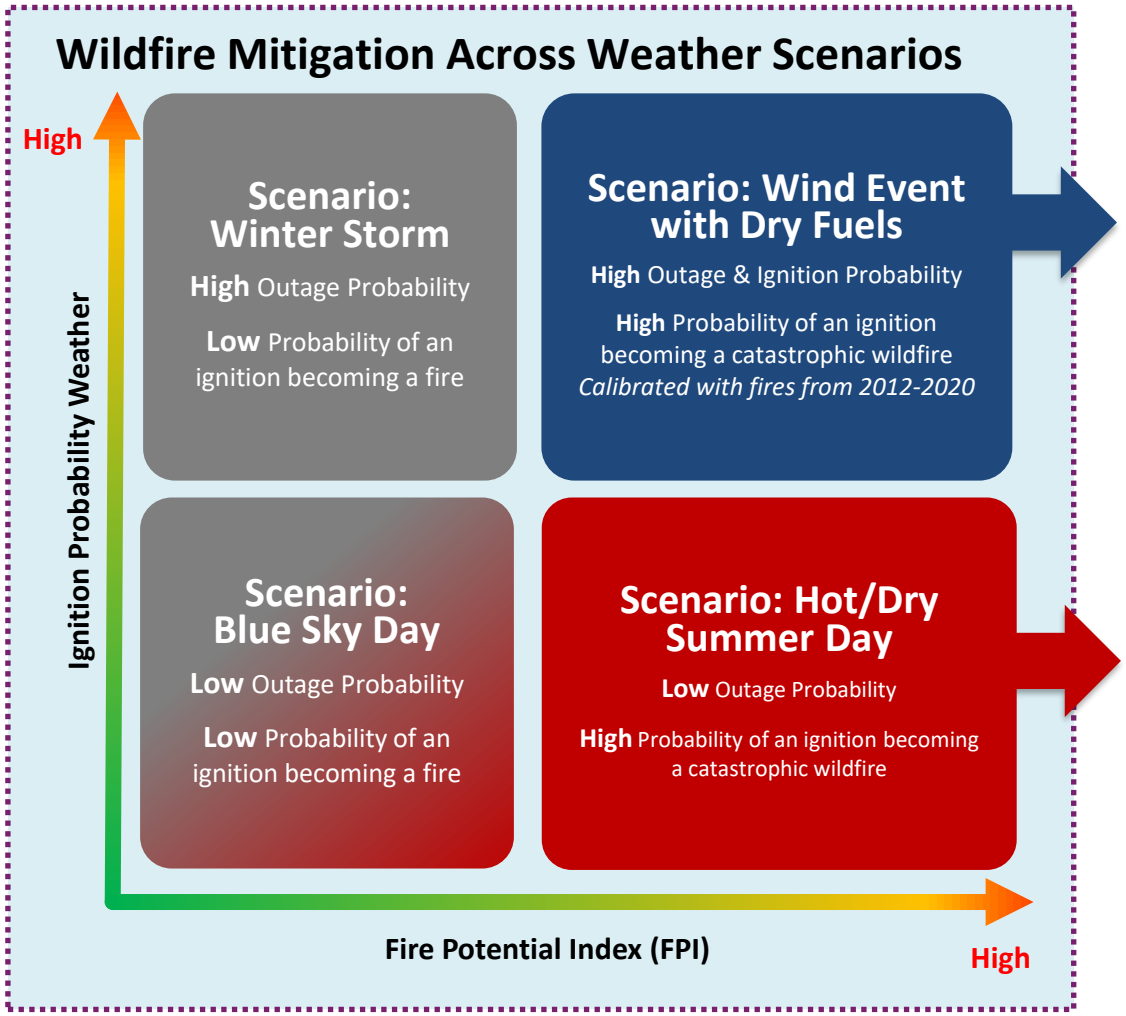
**$17M saved in 2024, $5M saved in 2025 YTD and $51M forecasted savings by 2025 EOY.*
***Compared to traditional work execution, mega-bundling forecasted savings through 2025 EOY*

Operational Mitigations and Community Engagement and Support

Weather-Driven Responses to Wildfire Risk

We combine our weather and ignition models to forecast the probability of a wildfire becoming catastrophic and then implement a weather-driven response.

Wildfire Mitigation Across Weather Scenarios



Enhancements to PSPS and EPSS

Public Safety Power Shutoff (PSPS)

Continuing to enhance machine-learning models for transmission and distribution PSPS.

Enhanced Powerline Safety Settings (EPSS)

Expanding down conductor detection to protect against high-impedance faults.

Year-Over-Year PSPS Comparison

PSPS impacts have declined significantly on a per-event basis through sectionalization, new, advanced technologies and improvements to the electric system infrastructure. We have reduced customer impacts without compromising safety.

Event Details	2019	2020	2021	2022	2023	2024	2025
PSPS Events	8	6	5	0	2	6	**4**
Total Distribution Circuits	1,458	685	231	-	24	235	**66**
Total Transmission Lines	303	132	6	-	2	15	**34**
Customers Impacted	**2,014,000**	**653,000**	**80,400**	**-**	**5,099**	**50,476**	**17,972**
Average Number of Counties Impacted	17	17	10	-	5	9	**6**
Average Number of Tribes Impacted	12	6	2	-	1	2	**1**
Average Outage Duration (hours)	43	35	31	-	17	32	**32**
Average Outage Restoration Time (hours)	17	10	12	-	5	7	**5**
Damage and Hazards	722	257	442	-	2	16	**3**
Potential Acres Burned*	3,500,000	912,000	691,000	-	28,251	95,692	**146,539**
Peak Wind Gusts	102 MPH	89 MPH	102 MPH	-	49 MPH	88 MPH	**61 MPH**

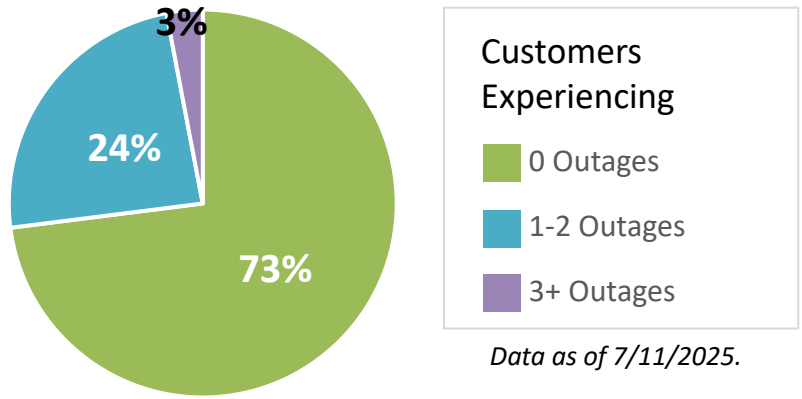
**Estimate based on simulations conducted which do not account for fire suppression.*

Protecting Customers with EPSS

Through real-time, continuous improvements, we are working to mitigate customer impacts and improve reliability without compromising the wildfire prevention benefits of EPSS.

EPSS Performance 2025 YTD

2M Customers Protected



Data as of 7/11/2025.

	2024 YTD	2025 YTD	Comparison
Circuit Mile Days*	~1.65M	~2.26M	**36%** increase
Number of Outages	777	897	**15%** increase
Avg. Outage Length	2.6 hours	2.4 hours	**7%** decrease
Avg. Customers Impacted per Outage	878 customers	750 customers	**14%** decrease

**Circuit mileage is approximate and leverages current device and circuit-level configuration.*

Data is approximate and as of 7/11/2024 and 7/11/2025.

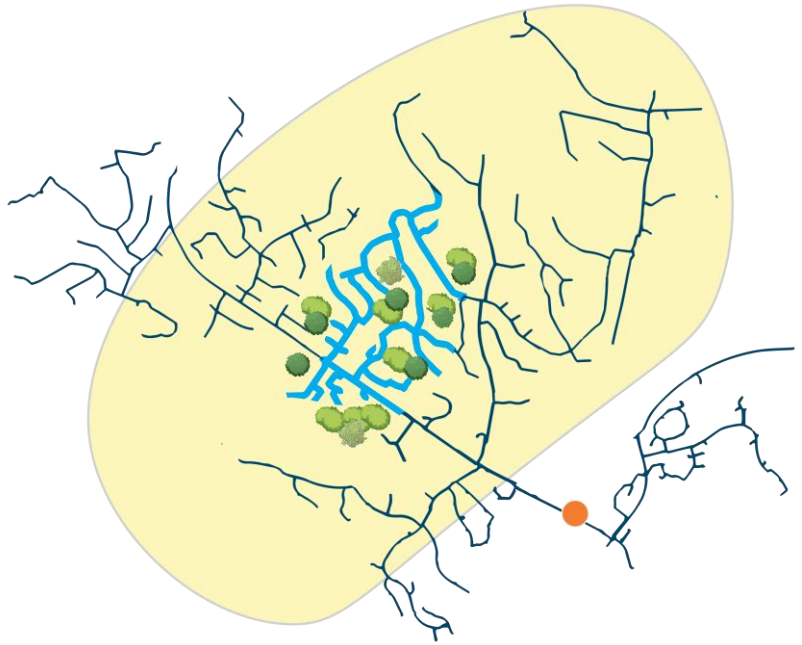
Work to improve reliability

Trimming and removing trees | Adding sectionalizing devices | Installing Gridscope devices and fault indicators | Installing animal guards

Undergrounding's Relationship to PSPS Scope Reduction

No/Limited PSPS Scope Reduction

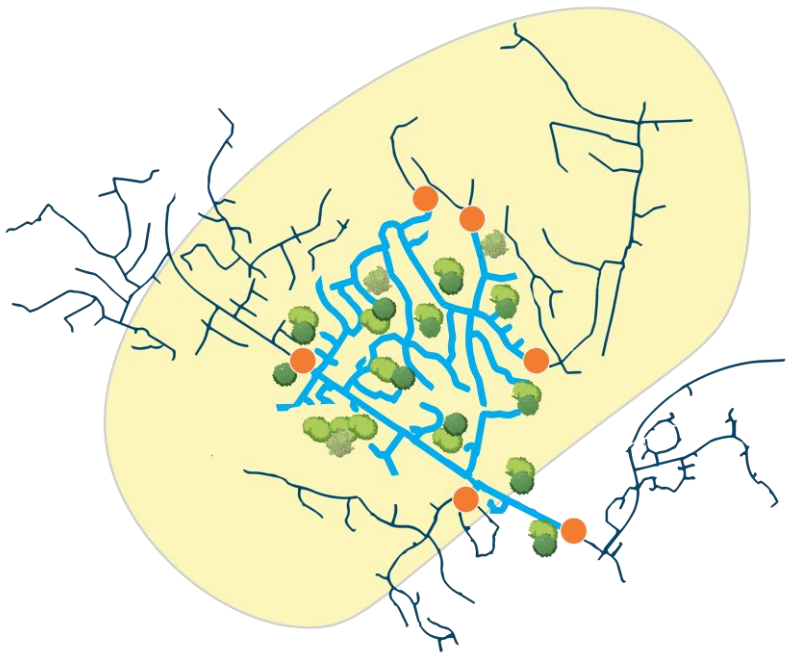
Underground lines do not connect to an energy source outside of High Fire-Risk Area (HFRA). No safe way to serve customers during a PSPS.



Undergrounding does however eliminate the majority of EPSS outages on lines moved underground.

Potential PSPS Scope Reduction

Underground lines do connect to an energy source outside of High Fire-Risk Area (HFRA). Lines can be safely isolated and energized during a PSPS.



PG&E estimates that approximately 37,800 customers are potentially mitigated from PSPS due to 945 completed miles of undergrounding*.

*In our 2023-2025 WMP, PG&E assumed that approximately 40 customers are mitigated from PSPS per mile of undergrounding.

LEGEND

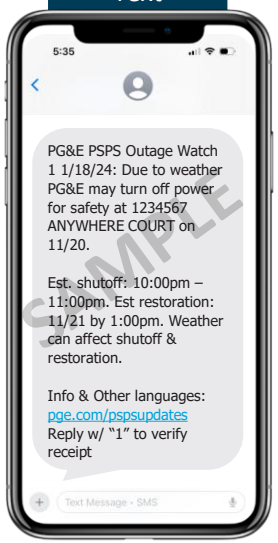
- HFRA
- Underground Powerline
- Overhead Powerline
- Source-Side Device

Communicating Before, During and After Safety Outages

PSPS Notifications

- **Priority: 72-48 hours** before power is turned off
- **Watch: 48-24 hours** before power is turned off
- **Warning: 4-1 hours** before power is turned off
- **Cancellation/Delay:** If shutoff is delayed/cancelled
- **At Power Shut Off**
- **Post-Weather Event:** Following weather “all-clear”
- **Update:** If the estimated time of restoral changes
- **Once Power is Restored**

“WATCH” Text



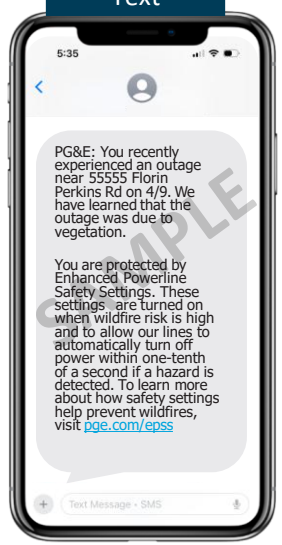
Improvements

- Began providing notifications in American Sign Language
- Automated some notifications to improve timing and accuracy
- Implemented new notification dashboard to promote real-time tracking and increased awareness on missed notifications

EPSS Notifications

- STAGE 1: **Outage Occurs**
- Outage Acknowledgement
- STAGE 2: **Access Lines and Equipment**
- Outage Update
- STAGE 3: **Assess and Repair Damage**
- Estimated Restoration Time
- STAGE 4: **Power Restored**
- Outage Cause and Planned Improvements

“WATCH” Text



Improvements

- Developed more robust process for follow ups after outages
- Began pilot effort to create and share outage cause video

We also leverage our website, social media, partnerships with agencies and Community Based Organizations (CBO), local news and more to keep customers updated.

Coordinating with Tribal, Local and Public Safety Partners

We conduct year-round, robust coordination with key partners to share information and ensure preparedness ahead of and during safety outages.

2025 Targeted Engagements

~120	Local Government Forums
20	Regional Working Groups
4	Data Portals Trainings
4	CWSP Advisory Committee Meetings
3	Critical Customer Webinars
2	PSPS Exercises
1	Regional Tribal CWSP Webinar

During a PSPS, we share information through multiple channels:

- ✔ Texts, emails and phone calls
- ✔ Agency Portal with situation reports, outage maps and customer lists
- ✔ State Executive Briefings
- ✔ Systemwide Cooperators Calls
- ✔ Cooperators Communications
- ✔ Agency Representatives
- ✔ Third-party representatives
- ✔ Notifying Public Safety Answering Points
- ✔ Critical Infrastructure Leads

Data is approximate and as of 7/31/2025

Supporting Customers During Safety Outages

We engage with customers year-round and offer programs and partnerships to help everyone, especially vulnerable customers, prepare for safety outages. We are working to make our communications more targeted and effective.

2025 Back-Up Power Resources Delivered

Portable Battery Program*	**1,532** Batteries distributed
Self-Generation Incentive Program*	**574** Applications paid
Residential Storage Initiative*	**1,056** Systems installed
Generator and Battery Rebate Program*	**1,619**
Permanent Battery Storage Rebate Program*	**270** Rebates paid
Backup Power Transfer Meter**	**593** Rebates paid

**Data is approximate and as of 7/31/2025*
***Data is approximate and as of 6/30/2025*

Support During Safety Outages

- ✔ Community Resource Centers (CRCs) during PSPS only, including transportation to CRCs
- ✔ California 211 Providers Network
- ✔ Disability Disaster Access and Resource Program
- ✔ In-language outreach and digital, social media, radio and television communications
- ✔ Discounted and no-cost hotel stays during PSPS only
- ✔ Local food bank meal replacement and Meals on Wheels meal delivery during PSPS only

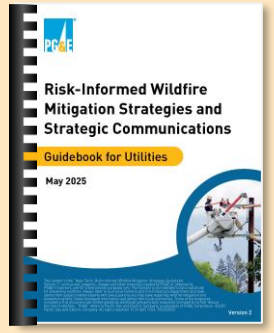
2025 Targeted Engagements*

Emails and direct mail campaigns	**72**
Wildfire safety webinars and open houses	**22**
Community-Based Organization (CBO) trainings	**5**

Benchmarking and Lessons Learned

Benchmarking and Lessons Learned

Gathering best practices and sharing learnings with industry peers are critical to our continued safety progress. We do this throughout the year via key forums. We also continuously provide and gather feedback from coworkers.



Wildfire Mitigation Guidebook for Utilities

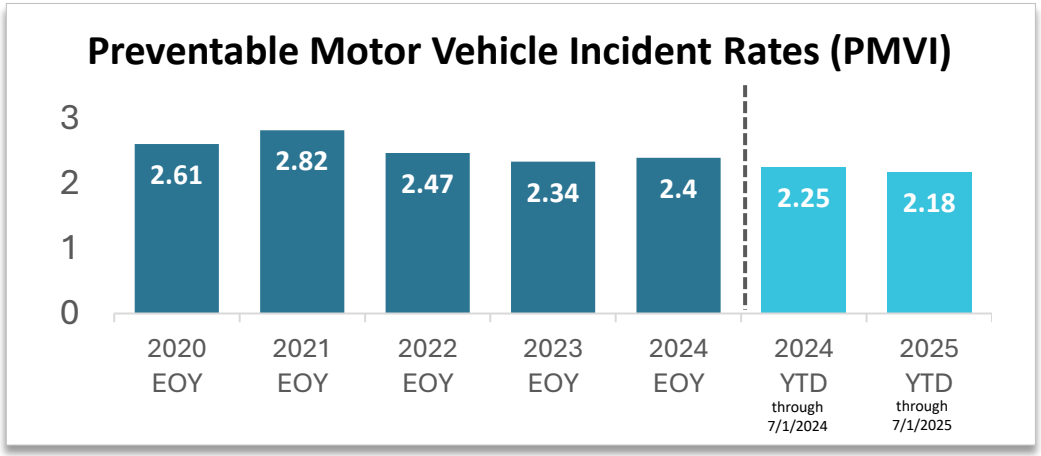
Our mindset is simple: we get better when we learn from others.	
Joint IOUs PSPS Working Group	• Collaboratively strengthened our AFN support framework • Refined coordination and communication processes across utilities • Aligning on recommendations for PSPS Statewide Executive Briefing
Joint IOUs Wildfire Mitigation Plan Project Management Group	• Acts as central hub for information sharing • Focuses on benchmarking and lessons learned • Develops best practices from member input • Meets quarterly
California Alliance for Safety and Training (CAST)	• Founded by PG&E in 2023 to unite IOUs • Quarterly meetings led by the Chief Safety Officers of each IOU • Four subcommittees of subject matter experts from each utility focus on key topics
Annual Utility Wildfire Mitigation Conference	• Two conducted since 2024 with 385+ participants representing 40 utilities across the Americas • Focused on sharing best practices from across the industry • Conducted various program-specific breakout/working sessions to share knowledge and problem solve • Incorporated broad representation from industry, regulatory, academic and CAL FIRE experts
Wildfire Mitigation Guidebook for Utilities	• Intended as central repository for PG&E utility wildfire mitigation knowledge • Outlines program-specific evolution, best practices and lessons learned • Highlights innovative tech and key partners
Listening and Engaging with Coworkers	• Delivering refresher trainings • Enhancing threat and hazard assessments and conducting additional risk assessments • Maturing elements of our PG&E Safety Excellence Management System

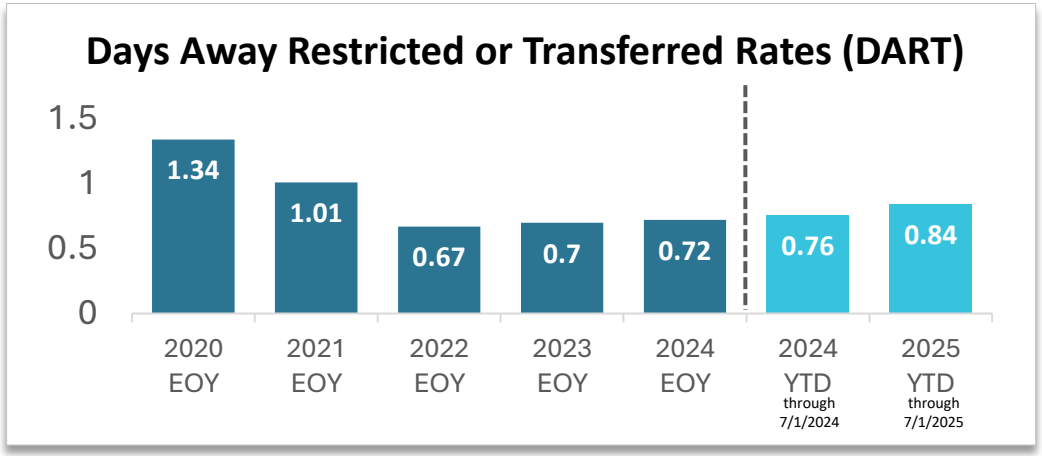
Thank You

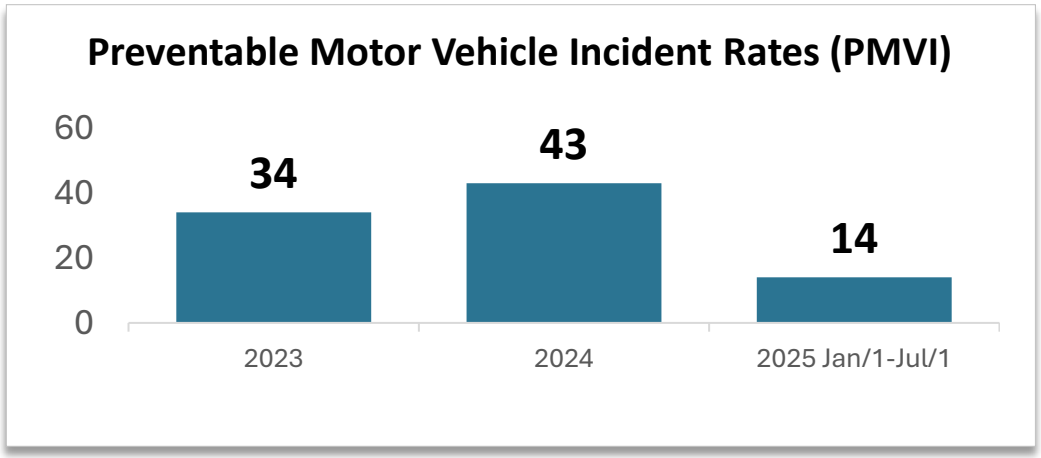
Appendix

Preventable Motor Vehicle Incident (PMVI) and Days Away, Restricted, or Transferred (DART)

PMVI and DART are key safety performance indicators that inform leadership decision-making and recommendations.







Days* Since Last Workforce Fatality

923 days

** Data as of 8/11/2025*

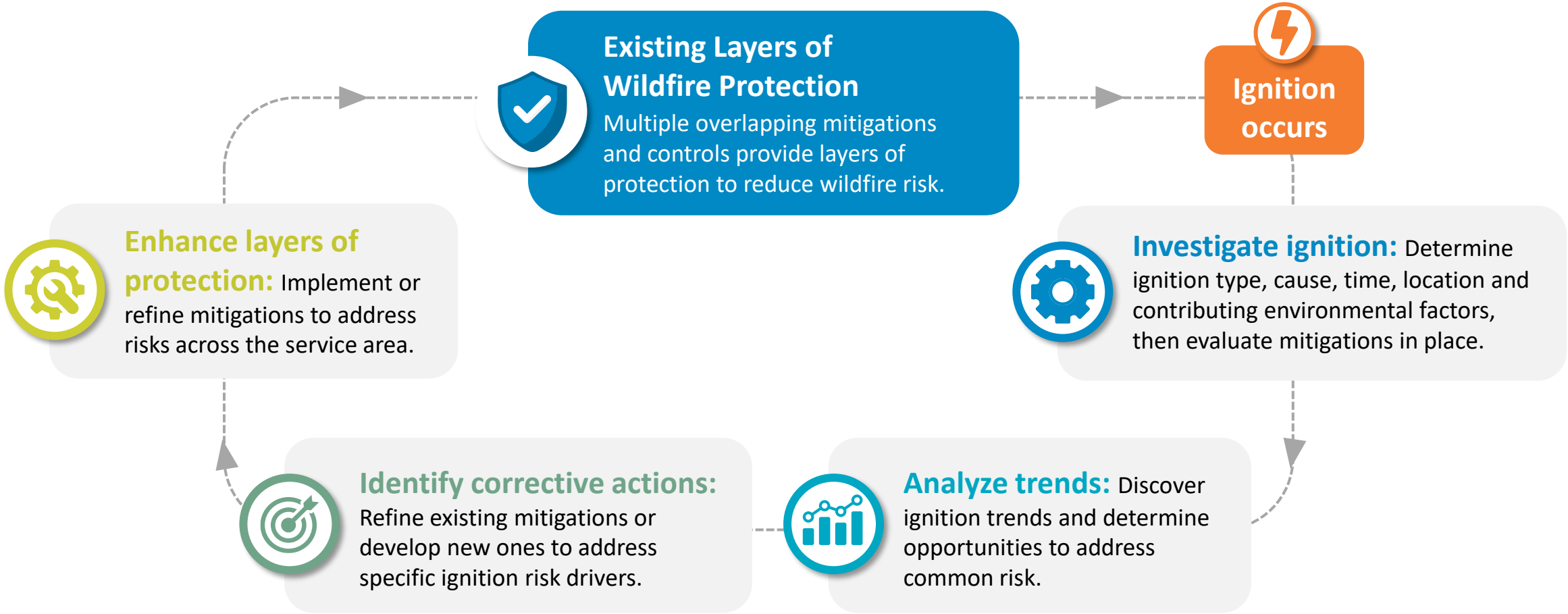
PMVI: Number of incidents where a PG&E coworker could have but failed to take reasonable steps to prevent incident; rate based on 1,000,000 miles driven.

DART: PG&E coworker injury that results in days away, restricted, or transferred duty; rate based on 200,000 hours worked.

Data as of 7/1/2025

Enhancing Our Layers of Wildfire Protection

We investigate all ignitions to continuously improve our layers of protection and implement corrective actions.



Undergrounding and System Upgrades Progress

Our undergrounding efforts expanded significantly with the launch of a standalone program in 2021. This work builds upon the foundational system upgrades efforts that began in 2018.

Undergrounding*

994
Total Miles Completed To Date

System Upgrades**

1,508
Total Miles Completed To Date

*Data as of 7/31/25. *The 10,000-Mile Undergrounding Program began in 2021, and 945 miles have been completed as part of that program. Totals include Butte Rebuild mileage. **Includes the installation of strengthened poles and covered powerlines and the removal of powerlines that were no longer needed. Includes data starting in 2018.*

Undergrounding Program Construction Technologies

We are using more efficient construction methods to meet our cost-savings goals.

These methods can be significantly faster than traditional trenching and excavation approaches. Using these new technologies can also result in additional flexibility as well as the use of fewer resources, where possible.