

# Safety Briefing

California Public Utilities Commission (CPUC)

November 10, 2021



**01**

**GOVERNANCE**

**02**

**WILDFIRE MITIGATION**

**03**

**SAFETY MANAGEMENT SYSTEM/  
SAFETY CULTURE**

**04**

**SAFETY PERFORMANCE**



# Governance





PG&E's Board of Directors has a **Safety and Nuclear Oversight Committee (SNO)**.



**The SNO reviews safety, risk and operational performance**, as well as results of cause evaluations for significant safety incidents. It also provides feedback to PG&E management for action and oversees the Wildfire Mitigation Plan and Public Safety Power Shutoff (PSPS) program.



The **six SNO Committee members** are all **independent** and **have deep expertise** in:

- Wildfire safety, wildfire prevention and/or wildfire mitigation
- Workforce and public safety
- Safe operation of natural gas systems
- Risk management
- Cybersecurity
- Nuclear safety



The board supports and approves the development of safety metrics tied to executive compensation and reviews annual performance. In 2021, the Compensation Committee exercised negative discretion to reduce 2020 incentive awards to officers.



# Improving Safety Through Experience

**The knowledge and experience of the 13 members of PG&E's Board of Directors is used to improve and inform safety outcomes.**

## Key experience areas include:

- Financial planning, performance and literacy
- Public policy
- Customer experience
- Workforce safety
- Community leadership
- Audit
- Technology and cybersecurity
- Leadership in energy and utility industry
- Clean energy innovation and technology
- Climate change mitigation and resilience
- Natural gas transmission, distribution, operation and safety
- Utility operation and engineering
- Wildfire safety, preparedness, prevention, mitigation, response and recovery
- Nuclear generation safety

# Wildfire Mitigation



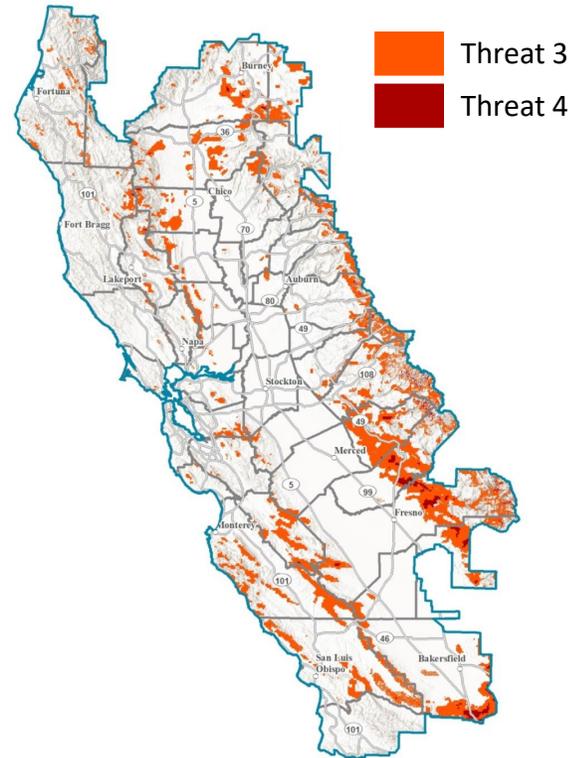
Between 2012 and 2018,  
PG&E's service area in high  
fire-threat areas increased  
by more than

**230%**

Our wildfire safety capabilities  
have expanded significantly to  
address this challenge.

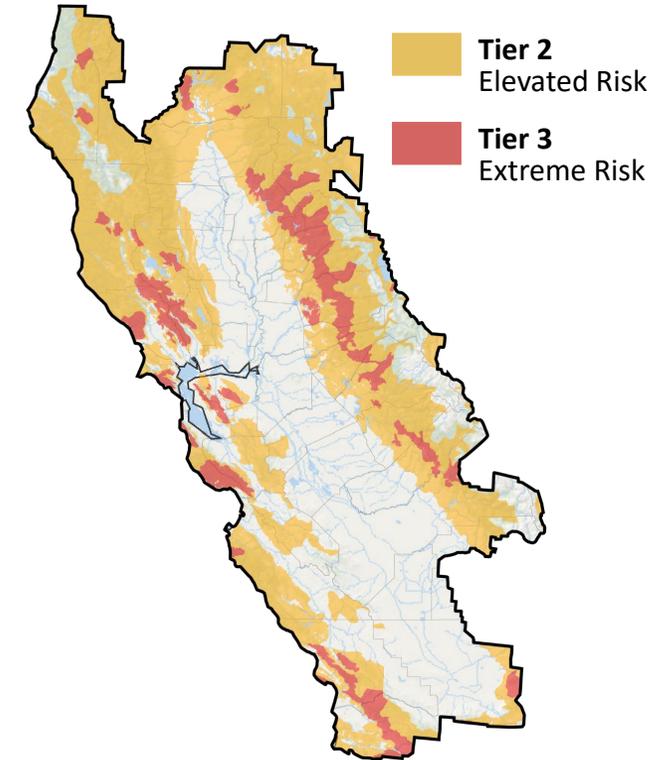
## 2012 CPUC Fire Threat Map

Less than 15% of PG&E's service  
area in high fire-threat areas



## 2018 CPUC HFTD Map

More than 50% of PG&E's service  
area in high fire-threat areas





# Wildfire Risk and PG&E's Electric System

Our service area has a unique risk profile that requires comprehensive wildfire safety solutions.

**~65%**

of California HFTDs are  
in PG&E's service area



**~31,000**

miles of PG&E transmission  
and distribution lines are  
in HFTDs



## HIGH FIRE-RISK (HFRA) MAP



Using advanced tools and technology we have a more refined view of wildfire risk to pinpoint the areas at greatest risk and prioritize our efforts.

As of April 30, this has resulted in ~500 additional Distribution and Transmission line miles identified for wildfire safety work.



# Expanding Wildfire Safety Capabilities

As the climate continues to change, **we are dramatically scaling up our wildfire safety capabilities** to better position our wildfire safety work and address potential threats in real time.

	2021 and Beyond
	Wildfire Risk Governance Steering Committee
	Advanced PSPS modeling capabilities using AI and machine learning
	“Report It” customer safety app
	Undergrounding focus of at least 10,000 miles
	Enhanced Powerline Safety Settings (EPSS)
	Enhanced Ignition Investigation Team
	Wildfire Risk Command Center, using Lean operating system
	Second-generation risk model, based on AI and machine learning capabilities
2019-2020	
	NASA-GOES 16/17 satellite fire detection*
	Customer and community PSPS event support
	PSPS expanded to all electric transmission and distribution lines in HFTDs
	Technosylva fire spread modeling
	Wildfire Mitigation Plan – system hardening, enhanced vegetation management (EVM), enhanced inspections and repairs and situational awareness*
2017-2018	
	First-generation risk model
	Routine vegetation management and tree mortality work
	Wildfire Safety Operations Center (WSOC)
	ALERTWildfire camera network*
	Weather station network*
	PSPS focused on electric distribution circuits in Tier 3 areas only

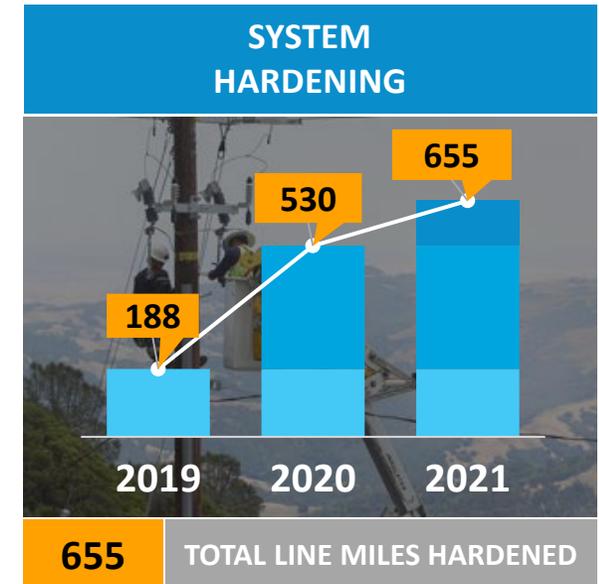
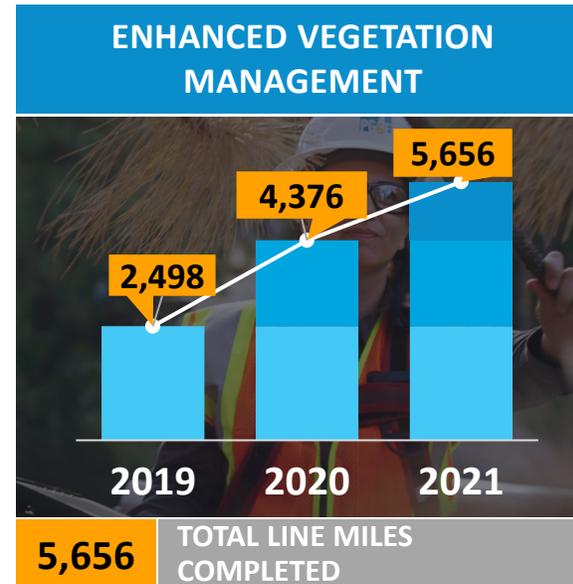
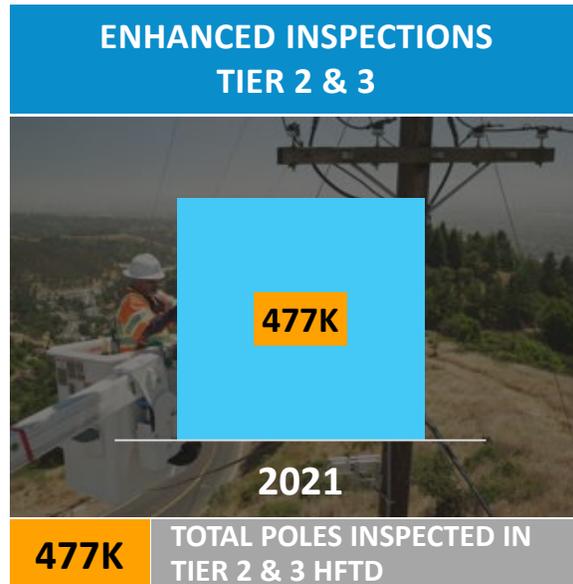
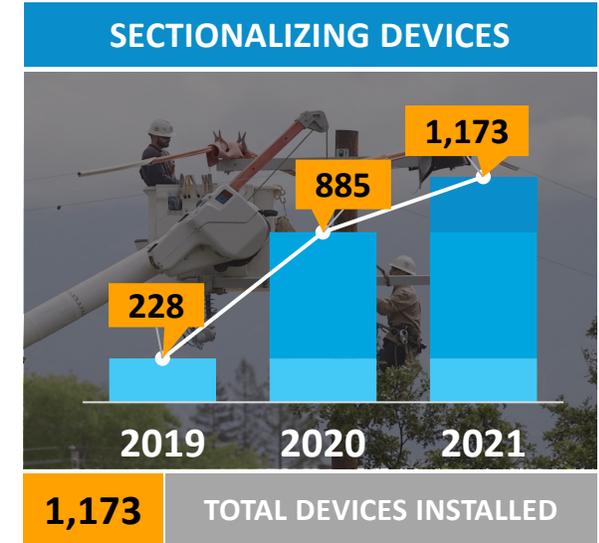
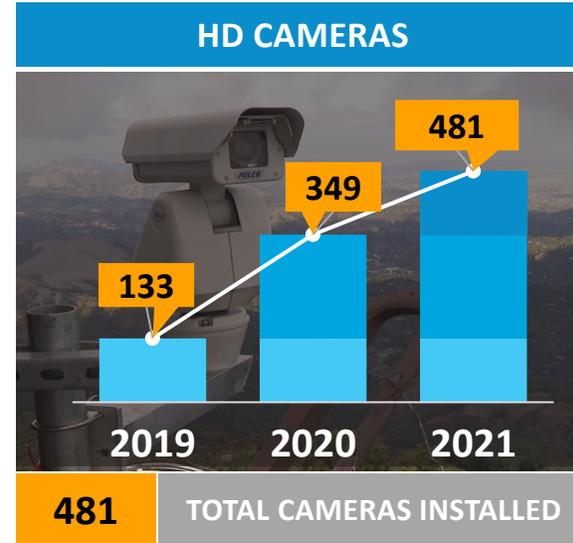
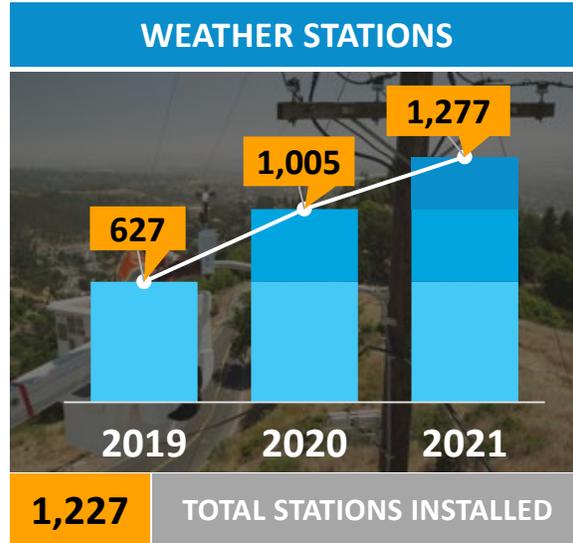
**\*Data from situational awareness tools is publicly available to customers, agencies and first responders.**

*Some of the measures included in this presentation are contemplated as additional precautionary measures intended to further reduce the risk of wildfires.*



# Progress on Safety Programs Year-Over-Year

We have continued to make **wildfire prevention programs** our top focus and have dedicated significant resources and investments to make our system safer.



Some of the measures included in this presentation are contemplated as additional precautionary measures intended to further reduce the risk of wildfires.

# Undergrounding 10,000 Miles

In July we announced a major new initiative to underground approximately **10,000 miles of power lines** in high fire risk areas.



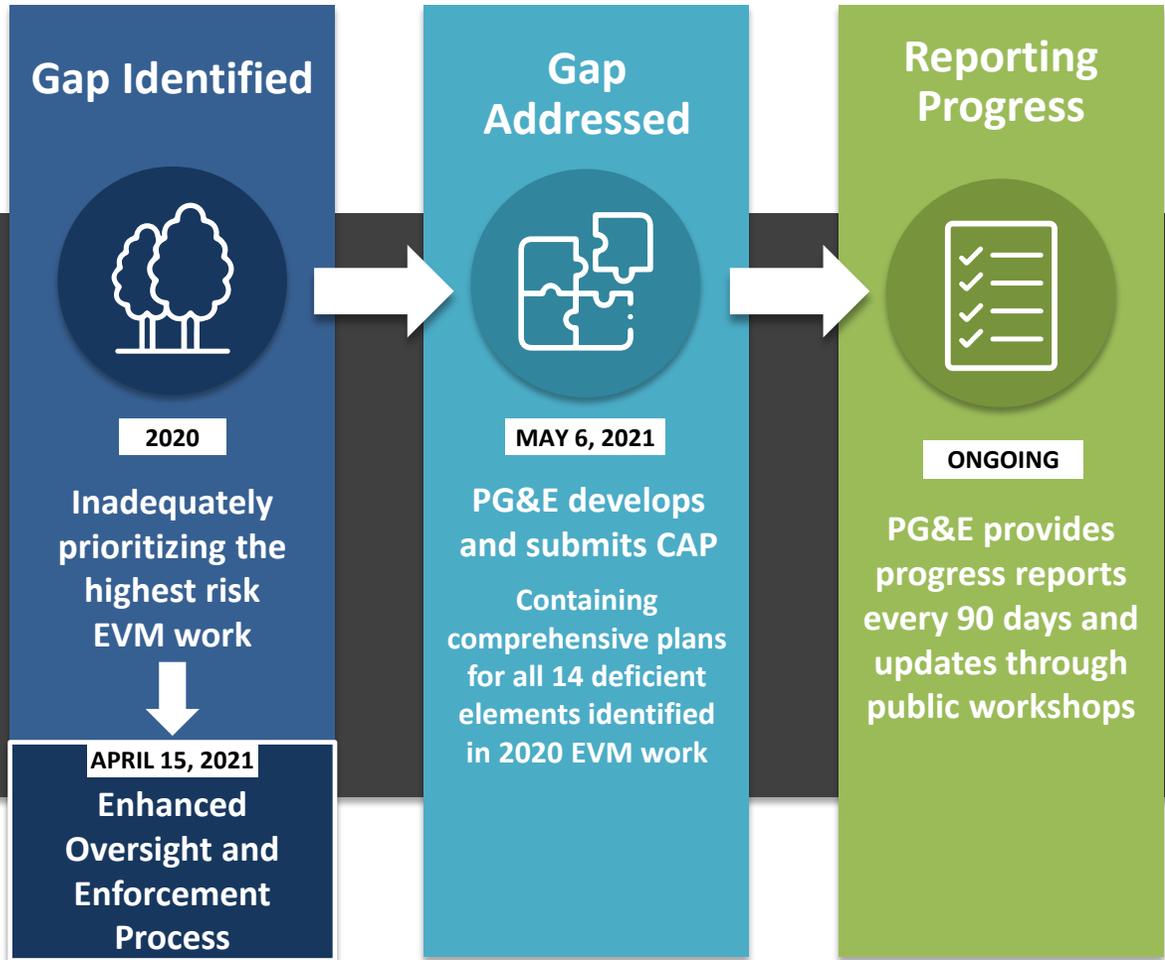
Undergrounding is the **best long-term solution** to reduce wildfire risk

- **This commitment represents the largest effort in the U.S. to underground power lines as a wildfire risk reduction measure**
- **The number of projects or miles undergrounded each year through our new expanded undergrounding program will evolve as PG&E performs further project scoping and analysis**
- **This effort will be included in our 2022 Wildfire Mitigation Plan**



# Corrective Action Plan: Targeting The Highest Risk Circuits for EVM

We submitted a Corrective Action Plan (CAP) on May 6, 2021 to address the risk prioritization of Enhanced Vegetation Management (EVM) work.



### Improvements

Our 2021 EVM scope of work **prioritizes the highest-risk** circuit protection zones (CPZs)

- Continuously improving our risk targets by identifying additional risk-ranked CPZs
- Tracking vegetation-related ignitions in real time
- Improving efficiency and rapid escalation of issues through the Lean Operating System and the EVM Command Center

### Results

**97%** of EVM work completed in **highest 20%** of CPZs\*

**1,282 miles completed\*** out of 1,800-mile goal

Exceeding our CAP for percent of 2021 EVM goal		
JUN 1	↑ 11% GOAL	<b>23%</b> ACTUAL
SEP 1	↑ 47% GOAL	<b>57%</b> ACTUAL

\*Data as of 9/30/2021

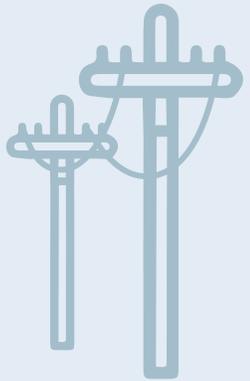
Some of the measures included in this presentation are contemplated as additional precautionary measures intended to further reduce the risk of wildfires.

We are continuing to evolve our wildfire prevention and safety efforts to address wildfire risk.

## NEW: Enhanced Powerline Safety Settings

**Enhanced Powerline Safety Settings** automatically turn off power if an object makes contact with an energized line.

- Implemented in late July 2021
- Were implemented across ~45% of circuits in high fire-risk areas
- Have undergone fine-tuning to reduce likelihood, duration and size of outages
- Have significantly reduced ignitions



## Improved Public Safety Power Shutoffs

This year, we improved our **Public Safety Power Shutoff (PSPS) protocols** to further reduce wildfire risk and customer impacts.

- High-resolution weather forecasting
- Industry-leading Technoslyva fire spread modeling and fire behavior analysis
- Machine learning models
- The incorporation of high priority vegetation and electric asset tags into our PSPS criteria



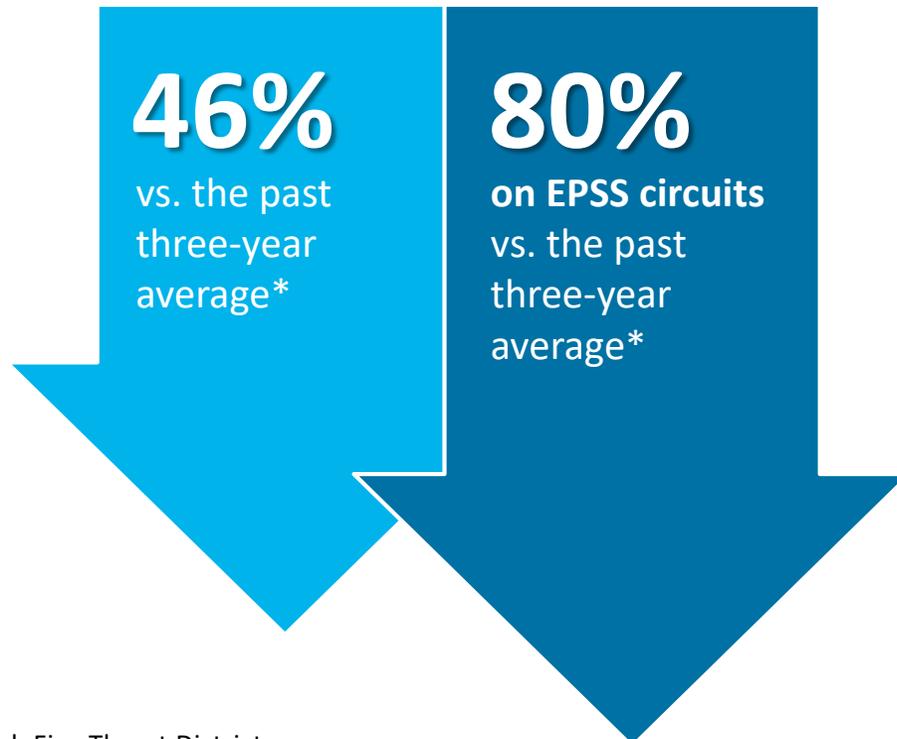


# Mitigating Wildfire Risk For Our Customers and Our Hometowns

We are seeing reductions in ignitions due to our evolving wildfire safety efforts

## Enhanced Safety Measures

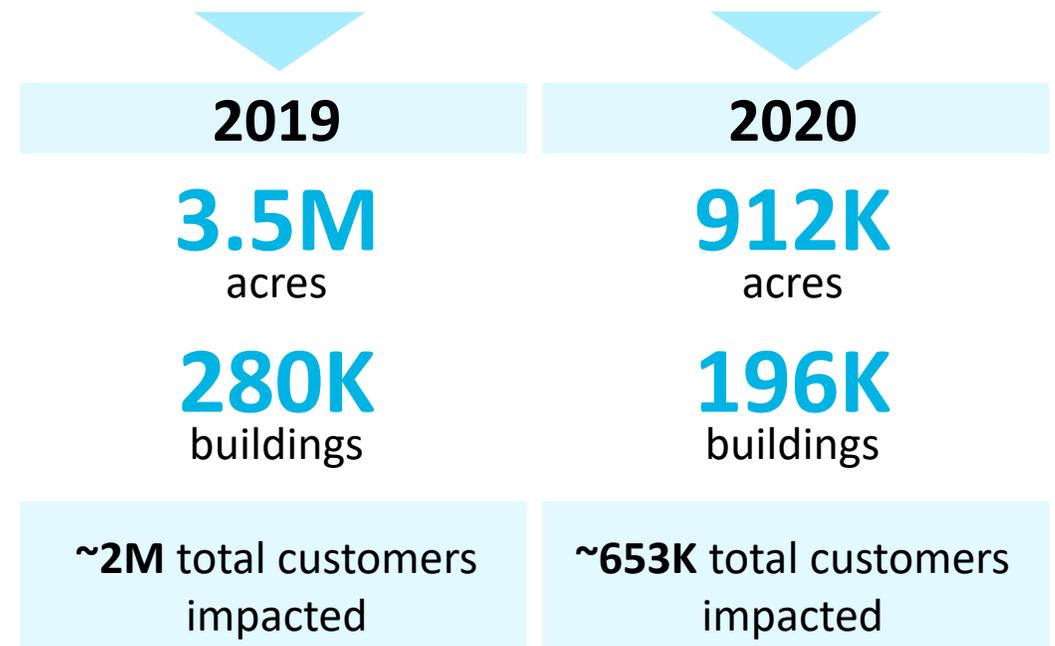
With new safety measures in place for 2021, CPUC-reportable ignitions are down



\*In High Fire-Threat Districts

## Shutoff for Safety

PSPS events in 2019/2020 prevented wildfires that could have impacted\*:



\*According to studies prepared by Technosylva



# EPSS Reliability Impacts and Improvements

## 2021 EPSS Overview



**598** EPSS OUTAGES



**~7 hrs** AVG CUSTOMER OUTAGE DURATION



**1,000** AVG IMPACTED CUSTOMERS



**23%** OF 170 EPSS CIRCUITS EXPERIENCED FIVE OR MORE OUTAGES

## Actions Taken

- ✓ Fine tuned sensitivity of devices to reduce likelihood of an outage
- ✓ Improved coordination between devices to reduce the size of outages
- ✓ Improved internal coordination of patrol crews for faster restoration times

## Progress

EPSS implemented July 2021

Before optimization of EPSS circuits:

↑ **Average outage length (CAIDI) increased by 12%\***

After optimization of EPSS circuits:

↓ **Average outage length (CAIDI) decreased by >12%\***

One of our most impacted EPSS circuits was Camp Evers 2105

**~14** OUTAGES IN FIRST TWO MONTHS OF EPSS

**Following mitigation efforts:**

**4** outages in the last month (2 during major wind event)

↓ **42%** reduction in average outage frequency

Data as of 10/10/2021

\*Data as of 10/20/2021 and compared to outages prior to implementing EPSS

CAIDI: Customer Average Interruption Duration Index

# Safety Management System/ Safety Culture





# Safety Certifications

**To reduce and manage risk and improve safety, we have received ISO 55001 and API 1173 certifications.**

## ISO 55001 Certification

ISO 55001 is an international standard that specifies the requirements for the establishment, implementation, maintenance and improvement of an asset management system.

**Both our Gas and Electric operations have received this certification. Additionally, our Gas operations has received multiple recertifications. By adhering to this standard, we are able to manage the lifecycle of our assets more effectively.**

### Benefits of using ISO 55001

- ✓ Standard operating language among all utilities and entities
- ✓ Improves processes for reducing and managing risk
- ✓ Aligning safety objectives with asset management system objectives

## API 1173 Certification

Since 2014, Gas Operations has had API 1173 certification. This certification provides pipeline operators with safety requirements that:

- Provide a framework to manage risk
- Promote a learning environment
- Continuously improve pipeline safety and integrity

**This holistic approach of “Plan-Do-Check-Act” is the American National Standard for pipeline safety management systems.**

# Gathering Feedback To Improve Our Safety Culture

**The National Safety Council (NSC)**  
 conducted a safety perception survey  
 with PG&E employees and contractors

**DEKRA Services**  
 conducted a safety culture assessment  
 of PG&E employees and contractors



**Both Identified Common Opportunities  
 for Improvement and Themes:**

- ✓ Leadership engaging more closely with field employees
- ✓ Improving internal communication
- ✓ Improving leadership capabilities and engagement in safety initiatives
- ✓ Open and honest communication about safety

# Safety Performance



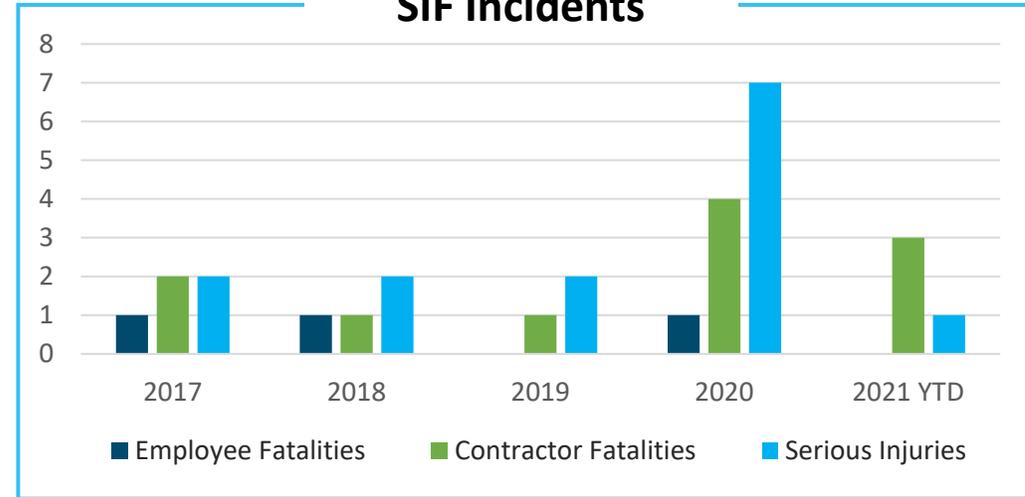


**Employee and contractor safety are a top focus for our teams**

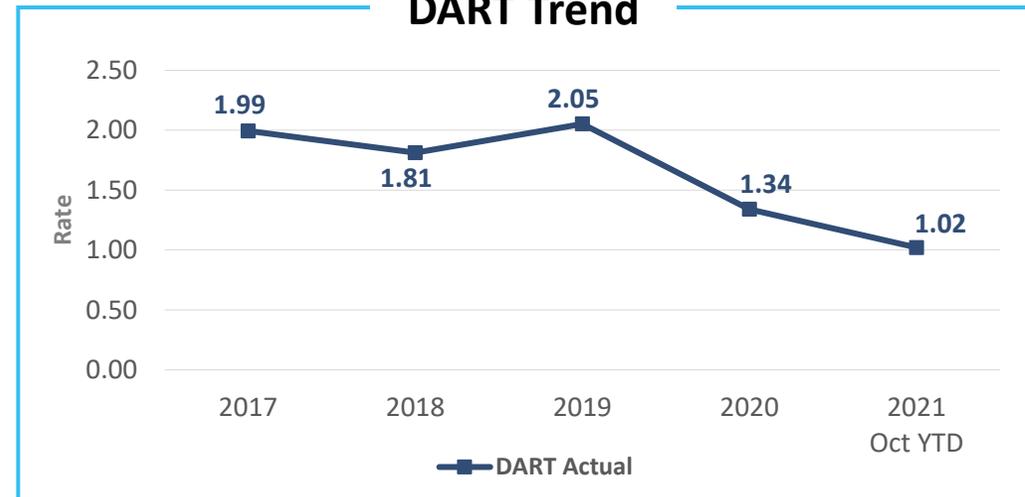
## SAFETY PERFORMANCE

- **67%** improvement in SIF actuals compared to 2020
- Zero employee SIF actuals in 2021
- **97%** of SIF investigations are completed within 30 days
- Achieving **97%** timely closure of SIF corrective action compared to **79%** in 2020
- DART rate has improved **50%** since 2019
  - Largest driver of DART rate, **77%**, is ergonomics

### SIF Incidents



### DART Trend



**SIF-Actual:** Serious injury is a life-threatening or life-altering injury, or a fatality; includes PG&E and high and medium risk prime and sub contractor employees  
**DART:** Injury that results in days away, restricted or transferred duty; Rate based on 200,000 hours worked; PG&E employees



# Public Safety and Operational Performance

METRICS	2020	2021*	CHANGE	PERFORMANCE
Electric 911 Emergency Response (within 60 minutes)	97.19%	97.83%	↑	<b>1<sup>ST</sup></b> DECILE
Total Dig-Ins Reduction Rate	1.11	1.01	↑	<b>1<sup>ST</sup></b> QUARTILE
Gas Customer Emergency Response	20.5 minutes	20.5 minutes	↑	<b>1<sup>ST</sup></b> QUARTILE
Large Overpressure Events	8	2	↑	<b>77.7%</b> IMPROVEMENT
Average Speed of Answer - Emergencies	9 seconds	8 seconds	↑	<b>11%</b> IMPROVEMENT VS. 2020
Safe Dam Operating Capacity (SDOC)	98.77%	99.89%	↑	<b>1.12%</b> IMPROVEMENT VS. 2020
DCPP Reliability and Safety Indicator	92.5	92.5	↔	<b>3<sup>RD</sup></b> QUARTILE <sup>1</sup>
Wire-Down Events due to Equipment Failure Rate	2.216	2.347	↓	<b>3<sup>RD</sup></b> QUARTILE <sup>2</sup>

<sup>1</sup>Quartile performance for DCPP Reliability and Safety Indicator is due to 2020 Unit 2 shutdown to perform generator repairs

\*YTD data as of September 30, 2021

<sup>2</sup>Quartile performance for Total Wires Down is being used as a proxy; Wires Down due to Equipment Failures only is not benchmarkable on its own

Some of the measures included in this presentation are contemplated as additional precautionary measures intended to further reduce the risk of wildfires.

# Key Focus Areas Moving Forward

**We are focusing on safety at all levels of the company and expanding the tools and resources available to our teams.**

**The following improvements are helping to enhance our safety culture:**

- Lean operating system drives coordination and accountability
- Regional service model quickly highlights issues at the local level
- Senior leaders engaged and involved in safety culture
- Daily safety updates
- Company-wide focus on breakthrough thinking and functional coordination



# Safety Briefing: Timeline of PG&E Incidents and CPUC/OEIS Actions

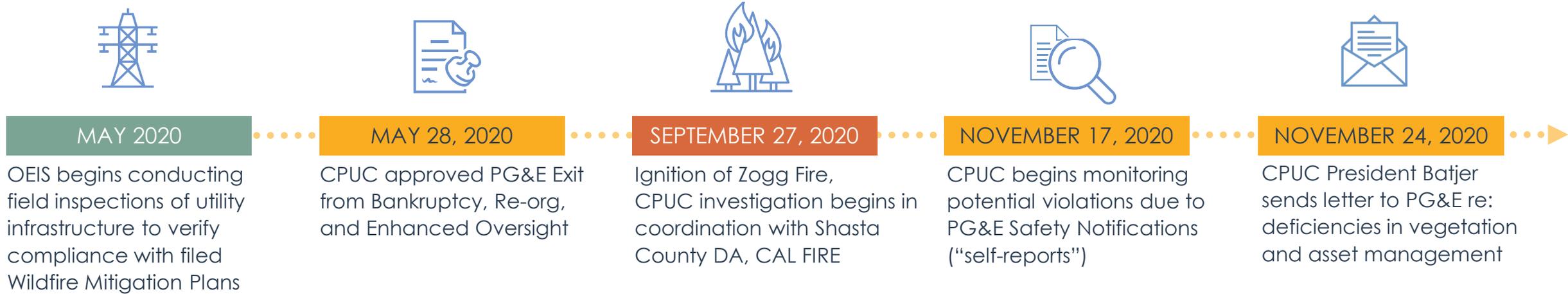
*November 2021*



California Public  
Utilities Commission

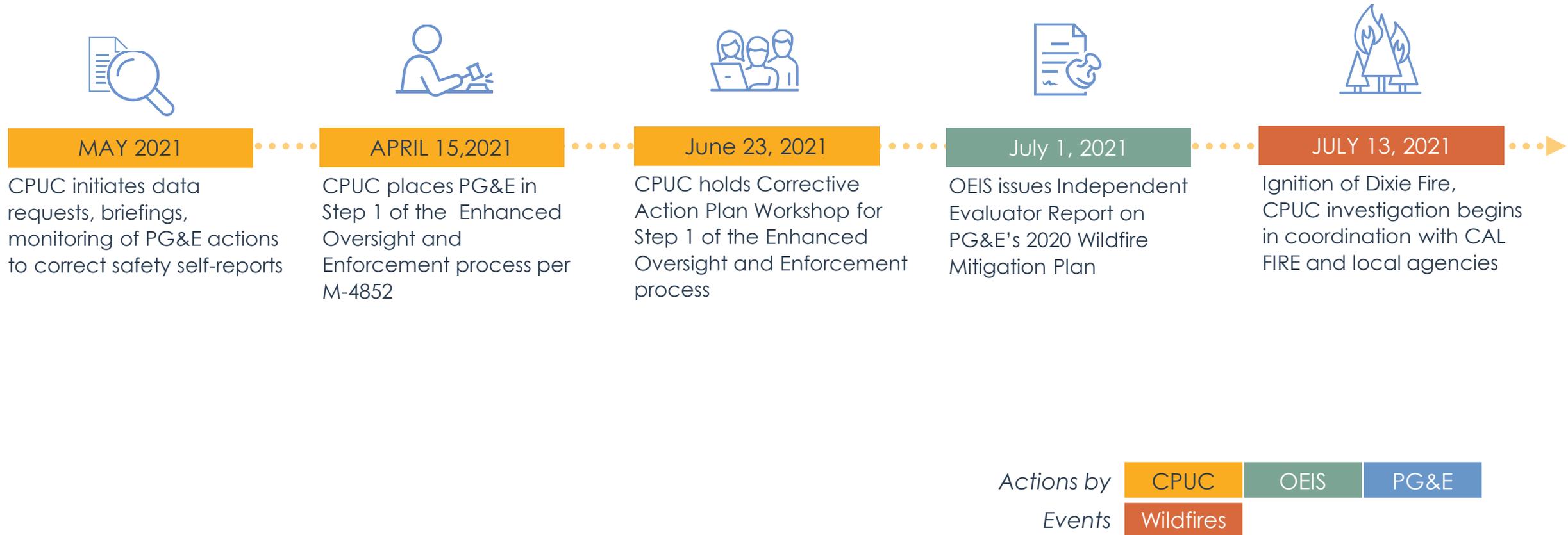
# Timeline: Actions Addressing PG&E Safety Issues

May – November 2020



# Timeline: Actions Addressing PG&E Safety Issues

May – July 2021



# Timeline: Actions Addressing PG&E Safety Issues

July – August 2021



JULY 22, 2021

Ignition of Fly Fire, CPUC investigation begins in coordination with CAL FIRE and local agencies



AUGUST 3, 2021

PG&E provides public briefing on PSPS readiness, as directed by CPUC



AUGUST 5, 2021

CPUC establishes framework for Independent Safety Monitor (M-4855)



AUGUST 4, 2021

PG&E submits 1<sup>st</sup> 90-day report on status of risk-driven Enhanced Vegetation Management

Actions by  
Events

CPUC

OEIS

PG&E

Wildfires

# Timeline: Actions Addressing PG&E Safety Issues

August – September 2021



AUGUST 5, 2021

CPUC issues Resolution M-4856 requiring additional notifications due to tree overstrike criteria for PSPS



AUGUST 18, 2021

CPUC President Batjer sends PG&E a letter about Safety Notices and Enhanced Oversight



AUGUST 24, 2021

CPUC Executive Director sends PG&E a letter directing it to improve its felled wood and removal program following 2020 and 2021 wildfire recovery.



September 22, 2021

OEIS issues evaluation of PG&E's 2021 Wildfire Mitigation Plan Update and requires Progress Report on 28 areas of improvement due November 1, 2021

Actions by

CPUC

OEIS

PG&E

Events

Wildfires

# Timeline: Actions Addressing PG&E Safety Issues

October – November 2021



October 6, 2021

OEIS issues findings on annual Safety Culture Assessment of PG&E



October 11, 2021

OEIS issues Performance Audit of PG&E's 2020 Wildfire Mitigation Plan and accounting for costs



October 19, 2021

OEIS assesses PG&E's 2021 executive compensation structure to confirm inclusion of Board-level safety structure and reporting



October 25, 2021

CPUC President Batjer sends PG&E a letter directing it to take immediate action to reduce/mitigate customer impacts from the sudden loss of power because of its Fast Trip program.



November 1, 2021

CPUC Executive Director sends PG&E a letter confirming that PG&E shall remain in Step 1 of the Enhanced Enforcement and Oversight process.

Actions by

CPUC

OEIS

PG&E

Events

Wildfires

# Timeline: Actions Addressing PG&E Safety Issues

November 2021



November 4, 2021

CPUC adopts decision on Safety & Operational Metrics for PG&E in Rulemaking 20-07-013



November 4, 2021

OEIS completes 2,460 field inspections of PG&E facilities and issues 180 notifications of defects



November 4, 2021

PG&E submits 2<sup>nd</sup> 90-day report on status of risk-driven Enhanced Vegetation Management



November 8, 2021

CPUC holds public workshop on PG&E progress under Enhanced Oversight & Enforcement, Step 1: risk-driven Enhanced Vegetation Management



November 10, 2021

PG&E provides Board-level safety briefing as required by statute

Actions by

CPUC

OEIS

PG&E

Events

Wildfires