

# 2022 Wildfire Mitigation Plan

## Public Safety Power Shutoffs

**Shawn Holder, Director**

March 10, 2022



Together, Building  
a Better California



# Year-Over-Year PSPS Overview

In 2021, we continued to evolve and improve, keeping our customers safe and reducing the impact of PSPS events.

Event Details	2019	2020	2021	Improvement
<b>PSPS Events</b>	7	6	5	<b>17%</b> fewer outages
<b>Customers Impacted</b>	2,014,000	653,000	80,400	<b>88%</b> fewer customers impacted
<b>Average Number of Counties Impacted</b>	17	17	10	<b>41%</b> fewer counties impacted
<b>Average Outage Duration (hours)</b>	43	35	31	<b>11%</b> less time without power
<b>Average Outage Restoration Time (hours)</b>	17	10	12	<b>20%</b> increase restoration time
<b>Damage/Hazards</b>	722	257	442	(13% decrease in restoration time when excluding January PSPS event)
<b>Peak Wind Gusts</b>	102 MPH	89 MPH	102 MPH	
<b>Potential Impacted Acreage Prevented*</b>	3.5M	912K	691K	
<b>Potential Damaged Structures Prevented*</b>	280K	196K	86K	



**97%** notification accuracy



**98%** Medical Baseline notification accuracy



**ZIP Code Alerts** expanded to both customers and non-customers

\*According to studies prepared by Technosylva  
Slide data is approximate



# Post-PSPS Customer Survey Feedback

In 2021, we began to survey customers about their PSPS experience. This information is being used to guide programmatic improvements in 2022.

## Methodology

- 3 online surveys (August, September and October 2021)
- Sent to customers deenergized and notified about events
- Topics included outage notifications, PSPS resources and suggested areas for improvement

## Top Themes

- **October PSPS events showed significant improvement** compared to August and September events
- **Top issues identified across all surveys:**
  - Accurate restoration time estimates
  - Resources to those with disabilities, medical or other critical needs
- **Generally low awareness and usage of resources (e.g., CBOs)**
- **Most common verbatim comments about lost food and added costs (e.g., fuel for generators)**

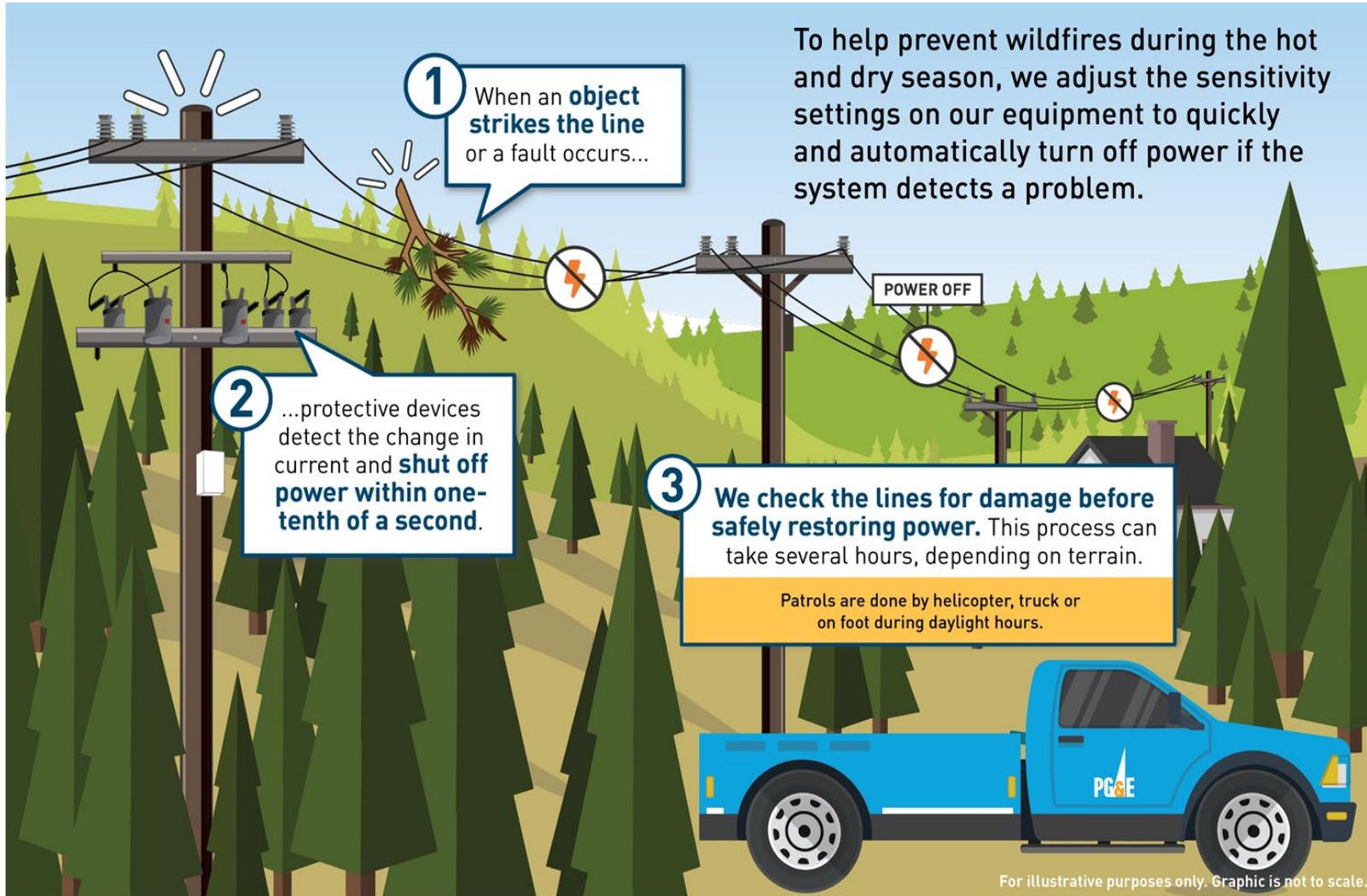
**~9%**  
total response rate

**34,542**  
surveys distributed

## Actions To Address Feedback:

- **Improving awareness** of community-based organizations, food resource partnerships and more through increased outreach and education
- **Updating notifications** to be more clear, concise and accurate, working in coordination with our customers
- **Expanding access** to portable batteries and generator rebates
- **Increasing availability** of food banks, Meals on Wheels and grocery delivery
- **Reducing impacts** by installing more sectionalizing devices and distribution microgrids

# Enhanced Powerline Safety Settings (EPSS)



## EPSS IN 2021

**~45%**  
of HFTD  
circuit miles

**~40%**  
vs. the past  
three-year  
average\*

**~80%**  
on EPSS circuits  
vs. the past  
three-year  
average\*

\*compared to 2020

## EPSS IN 2022

Expanding to  
**100%**  
of HFTD  
circuit miles

- While focusing to minimize outages by**
- Targeted vegetation, equipment and animal protection work
  - Dedicated crews for faster restoration & readiness response

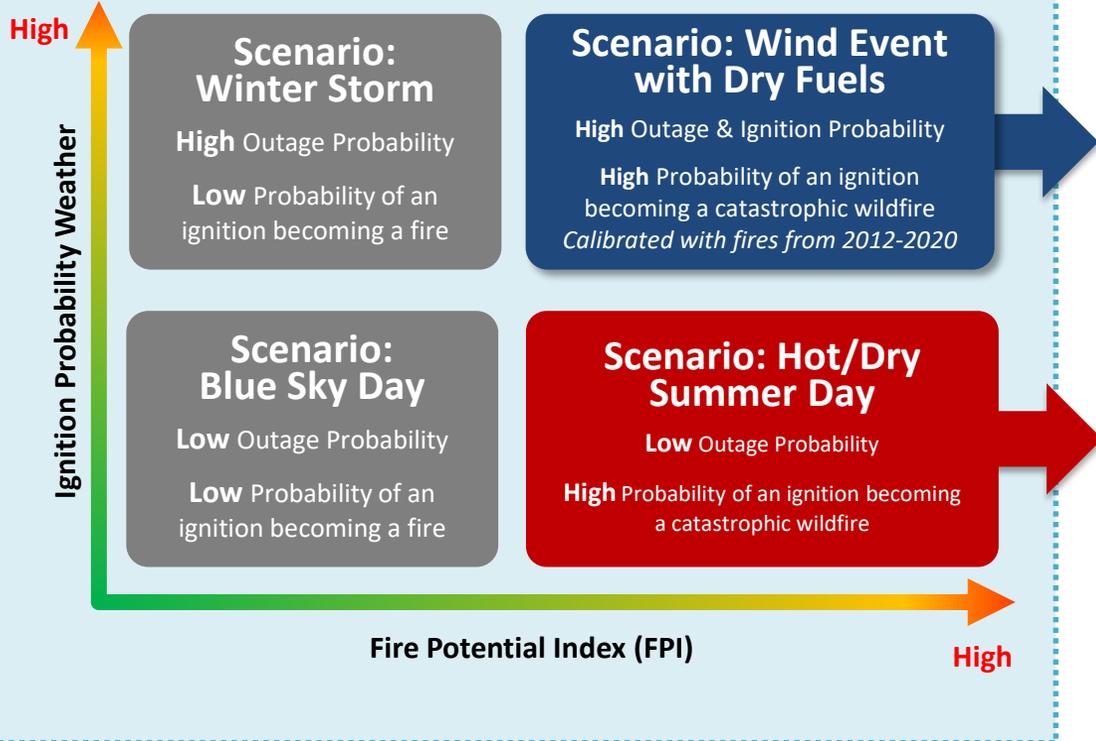


# PSPS & EPSS: Differing Risk Mitigation Targets



## Year-Round Wildfire Mitigation

- Undergrounding
- System Hardening
- Enhanced Inspection and Repair



## Weather-Driven Response

### Public Safety Power Shutoff (PSPS)

Turning off power during severe weather to prevent tree branches and debris from contacting energized lines.

#### PSPS IN 2021

17% fewer outages<sup>1</sup>

88% fewer customers impacted<sup>1</sup>

#### 2022 FOCUS

Continuing to refine program and reducing impacts in the areas at highest risk

### Enhanced Powerline Safety Settings (EPSS)

Using equipment on powerlines that allows them to turn off power within one tenth of a second if a tree branch or object strikes the line.

#### EPSS IN 2021

In place on ~45% of HFTD circuit miles

#### 2022 FOCUS

Expanding to 100% of HFTD circuit miles (Due to 80% CPUC Reportable ignition reduction in 2021 for EPSS-enabled circuits)



# Questions & Feedback



Together, Building  
a Better California

# Public Safety Power Shutoffs (PSPS)

**Brian D'Agostino**

Director, Fire Science & Climate Adaptation

**Danielle Kyd**

Manager, Access and Functional Needs Customer Strategy

**Mona Freels**

Manager, Emergency Services

# Overview



- **No fundamental changes to the PSPS methodology planned in 2022**
- Exploring process improvements and mitigating customer impacts through academic partnerships, situational awareness enhancements, strategic hardening & community resiliency projects
- Improved weather forecasting system to include AI-based forecasting
- Statistics / analytics remain updated & enhanced (e.g., conductor risk, wind percentiles, vegetation risk & wildfire risk)
- Updated internal dashboards & geospatial tools to support decision-making
- Continue to enhance customer support, including those with AFN, during a PSPS

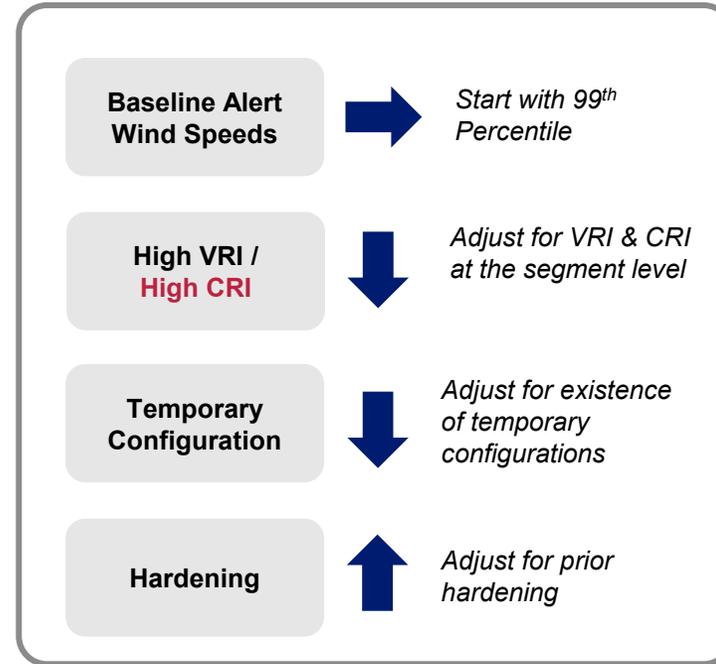
# PSPS Decision-Making Framework



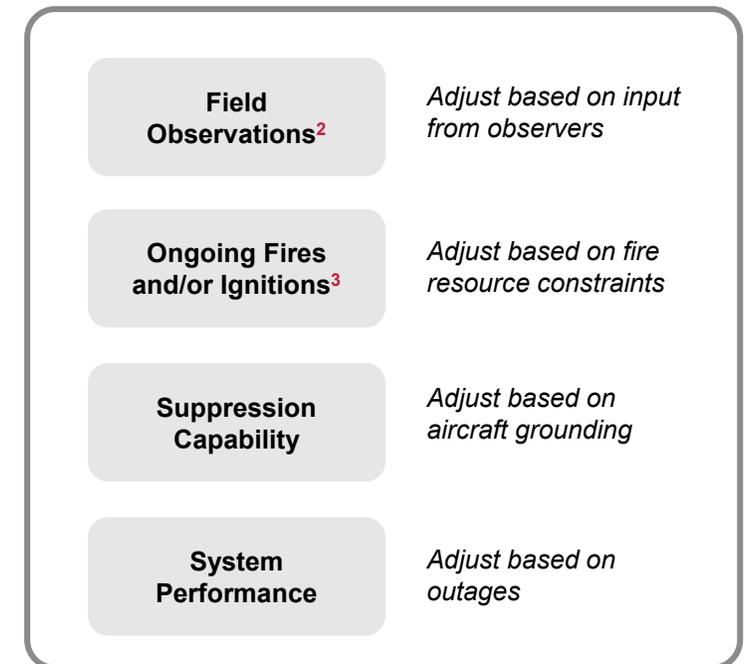
## Monitor Fire Condition Forecasts



## Establish Circuit List & Alert Wind Speeds based on Historical Wind Patterns<sup>1</sup>



## Use Field Information & Real Time Updates to Inform De-energization



- 1) If fire potential is not extreme, it can also inform adjustments to alert wind speeds
- 2) Field observations do not change alert speeds
- 3) Ongoing fires do not adjust alert speeds but rather adjust our PSPS decision-making when reaching alert speed

# Thanksgiving 2021 RFW & PSPS



- NWS Red Flag Warning (RFW) dates **11/24 - 11/26**
- Longest PSPS duration: **42 hrs. 11 min.**
- Average PSPS duration: **25 hrs. 13 min.**
- **54,527** customers notified
- **5,858** customers affected
- **~22,700** customers avoided PSPS due to enhanced situational awareness (FPI, 30s Wx)
- **Three** Community Resource Centers opened
- Peak wind gusts: **73 mph**
  - ✓ Stations at or > 60 mph: 6
  - ✓ Stations at or > 50 mph: 26
  - ✓ Stations at or > 95th percentile: 166
  - ✓ Stations at or > 99th percentile: 67
  - ✓ **New all-time records met or exceeded: 15**

**NATIONAL WEATHER SERVICE** San Diego CA  
**RED FLAG WARNING**

Winds 20 to 30 mph  
Gusts 40 to 60 mph  
5-10% relative humidity

10 AM Wednesday - 6 PM Friday

**PLAN** Bring flammable objects indoors (furniture, door mats, trash cans...)

**PREPARE** Have emergency kit ready to go. Consider packing it into car. Keep gas tank at least 1/2 full. Back your car into the driveway. Avoid use of equipment that may generate sparks.

**ACT** Keep phone charged, and stay up to date with official sources on social media

# Reduced PSPS Customer Impacts



Compared to similarly rated PSPS' in 2020

$$PSPS\ Score = Top\ 20\ Gust\ Avg \times \% \text{ Stations Above } 95th \times \frac{FPI^2}{C}$$



How strong?



How widespread?



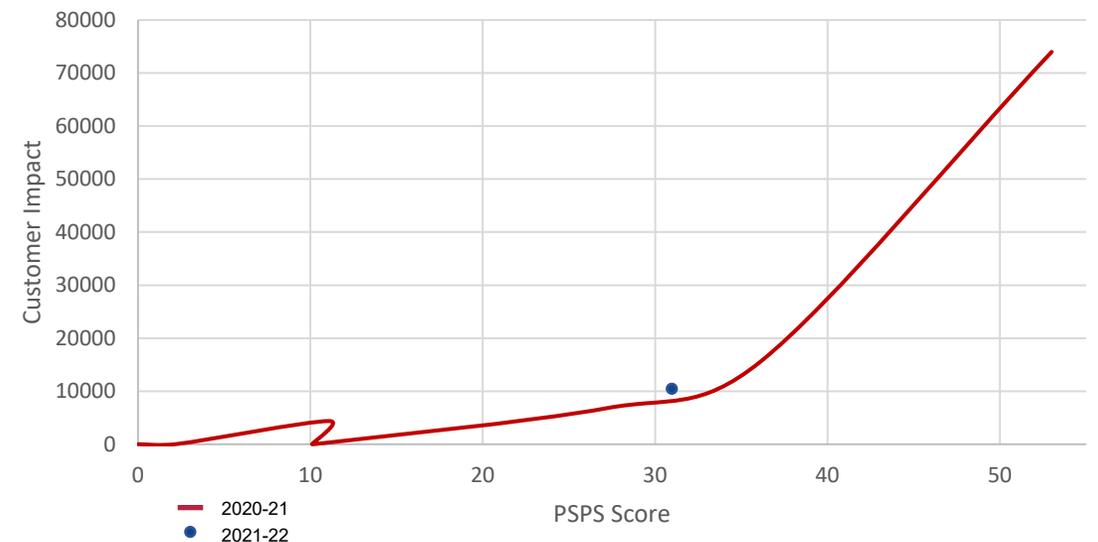
Weather/fuels?

## 2020-21

	Top 20 Gust Avg	% Above 95 <sup>th</sup>	FPI	PSPS Score	PSPS Impact
Sep. 8-9	43 mph	7.0%	Extreme (15)	2.3	49
Sep. 28-29	30 mph	0%	Extreme (15)	0	0
Oct. 26-27	46 mph	35.7%	Elevated (14)	11.1	4,373
Nov. 26-28	48 mph	36.2%	Elevated (13)	10.2	0
Dec. 2-5	71 mph	95.9%	Extreme (15)	53.0	73,977
Dec. 6-9	59 mph	78.6%	Extreme (15)	36.1	15,528
Dec. 23-24	57 mph	81.6%	Elevated (13)	27.2	6,797
Jan. 14-16	56 mph	36.2%	Elevated (12)	10.1	0

## 2021-22

	Top 20 Gust Avg	% Above 95 <sup>th</sup>	FPI	PSPS Score	PSPS Impact
Nov. 24-26	57 mph	79.8%	Elevated (14)	30.1	5,858

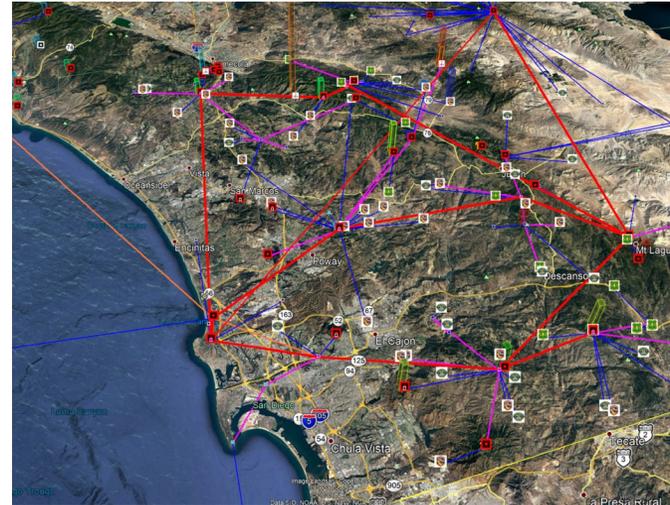


# Academic Partnerships



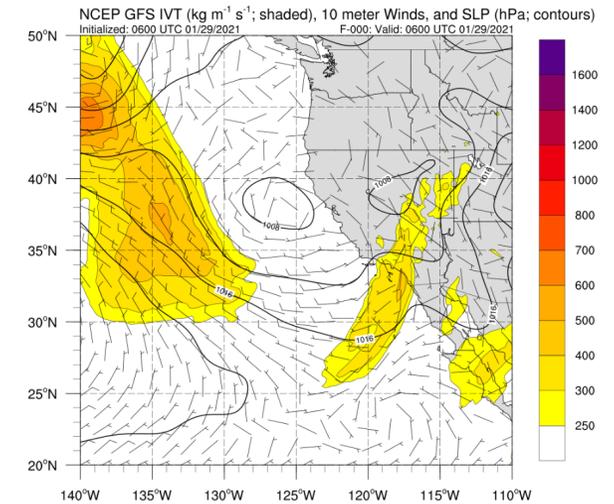
## University of California San Diego

- Expanded to **30 AlertSDG&E Cameras** including CAL FIRE additions
- **New partnership with AI industry expert** to identify smoke patterns & push notifications to key stakeholders

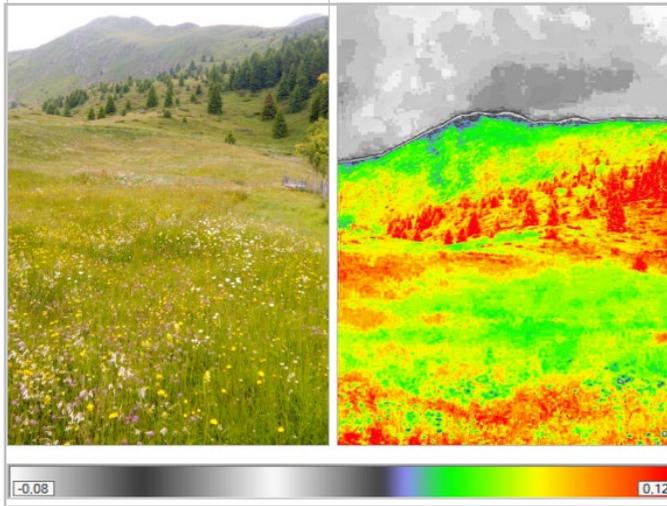


## Scripps Institution of Oceanography

- Continued **investment** in the High-Performance Wireless Research & Education Network (HPWREN)
- Installation of **communication nodes** at Community Resource Centers during PSPS
- Stabilizing fire station internet connectivity (ASAPNet) and providing **redundancy** to communication backbone
- Analysis of seasonal rainfall patterns to better understand the impacts of climate change
- **Expanded modeling** to include atmospheric rivers & extreme precipitation
- Monitoring San Diego Bay levels to inform **real-time coastal flood modeling**

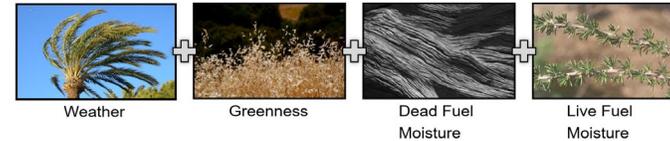


# Academic Partnerships



## San Jose State University

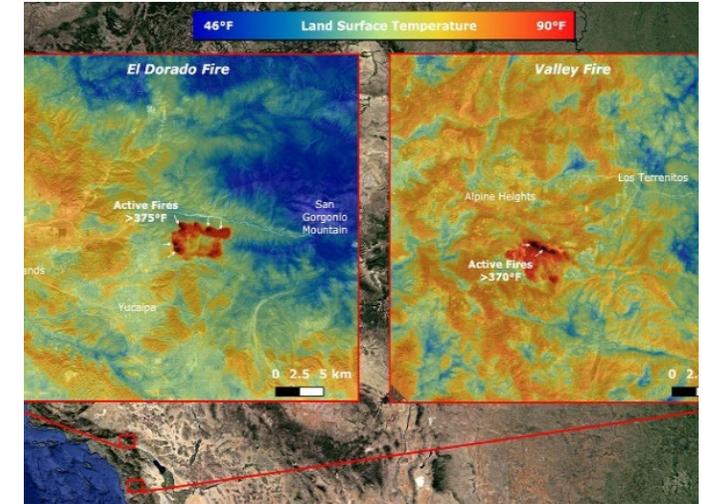
- Advancing fire science through increased fuel moisture monitoring & improved atmospheric modeling
- Adding cameras to monitor chlorophyll in vegetation (NDVI)
- Adding “Fuel Sticks” added to weather stations to measure 10-hour fuel moisture



	Tue 10/29	Wed 10/30	Thu 10/31	Fri 11/01	Sat 11/02	Sun 11/03	Mon 11/04	Tue 11/05
ME	Elevated 14	Extreme 16	Extreme 16	Elevated 14				
RA	Elevated 14	Extreme 16	Extreme 16	Elevated 14				
EA	Elevated 12	Extreme 15	Extreme 15	Elevated 14	Elevated 14	Elevated 13	Elevated 13	Elevated 13
NE	Elevated 12	Extreme 15	Extreme 15	Elevated 14	Elevated 14	Elevated 13	Elevated 13	Elevated 13
OC	Normal 11	Extreme 15	Elevated 14	Elevated 14	Elevated 13	Normal 11	Normal 11	Normal 11
NC	Normal 11	Elevated 14	Elevated 14	Elevated 12	Elevated 12	Normal 11	Normal 11	Normal 11
BC	Normal 11	Elevated 13	Elevated 14	Elevated 12	Elevated 12	Normal 11	Normal 11	Normal 11
CM	Normal 11	Elevated 13	Elevated 14	Elevated 12	Elevated 12	Normal 11	Normal 11	Normal 11

## SD Supercomputing Center

- Integrating AI-based analytics into utility operations & create a data sharing platform
- Data sharing to advance wildfire research & historical tree outages & weather analytics to inform Vegetation Management



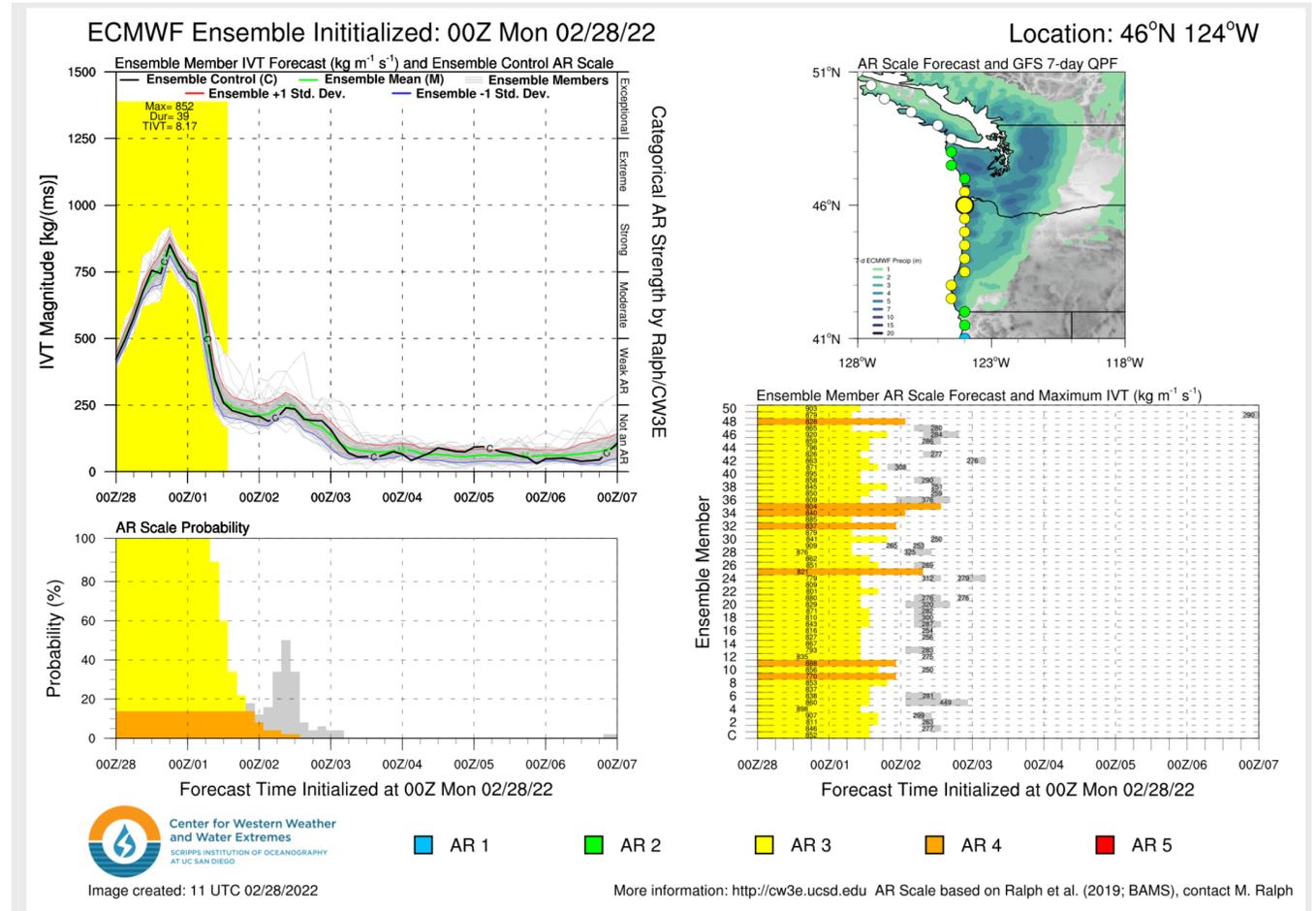
## UW Space Science & Engineering Center

- Expanding remote sensing from satellites to enhance situational awareness
- Satellites detect hot spots & automatically link with cameras in the area to provide alerts

# Next Generation Weather Computing



*Enhanced computing capabilities to improve granularity, ability to anticipate events, increase preparedness & decrease false alarms*



# 2021 AFN PSPS Support



## Community Resource Centers

Enhanced support including privacy screens, signage, dedicated parking & on-site ASL interpretation



## Tribal Communities

Southern Indian Health Council & Indian Health Council partners provide resiliency items, generators & other needs to tribal communities



## Centralized Resource Hub

211 San Diego and 211 Orange County connect customers to resources & direct support from 1k+ orgs (24/7/365, in 200+ languages)



## Food Support

SD Food Bank & Feeding SD partners provide mobile food pantries at rural, tribal, and PSPS sites, with warm food provided as needed



## Transportation

FACT paratransit partnership provides accessible transportation to customers' location of choice



## Hotel Stays

Salvation Army partnership provides no-cost hotel stays



# 2021 Thanksgiving PSPS

- Close **collaboration across key organizations** including 211 San Diego, FACT & Salvation Army
- Provided frequent updates to **>725 AFN partners** for support, coordination & message amplification
- Provided services included:
  - No cost **hotel stays**
  - **Generators** delivered on-demand
  - **Warm meals** at Community Resource Centers & tribal support
  - Additional **food support** from San Diego Food Bank
  - Accessible **transportation**
  - **Resiliency items** (e.g., blankets, car charger inverters, solar lamps)
- Meal donations - **Zero Waste, supporting sustainability**



San Diego Oasis @O... ·5h ...  
@FACTSD1 Thanks for the timely updates on the @SDGE planned Public Safety Power Shutoff. Your emails helped keep our members informed and safe during the fire weather conditions. 🙏🙏



# 2022 AFN Expanded Support



**Data + Automation**  
Data-driven, leveraging digital factory bots & automation to identify & target customers



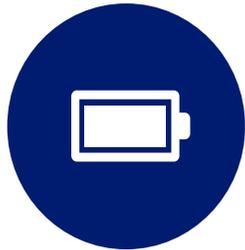
**PSPS Support**  
Expanding new partnership opportunities - wellness checks, AFN resiliency items, enhanced food resources



**Accessibility**  
24/7 on-demand American Sign Language (ASL), accessible websites & notifications



**Community Partners**  
40 dedicated High Fire Threat District partners - increased support. Regional resiliency & wildfire preparedness trainings & collaboration



**Generators**  
Expanded AFN eligibility. Emergency delivery & reserved units for tribal communities



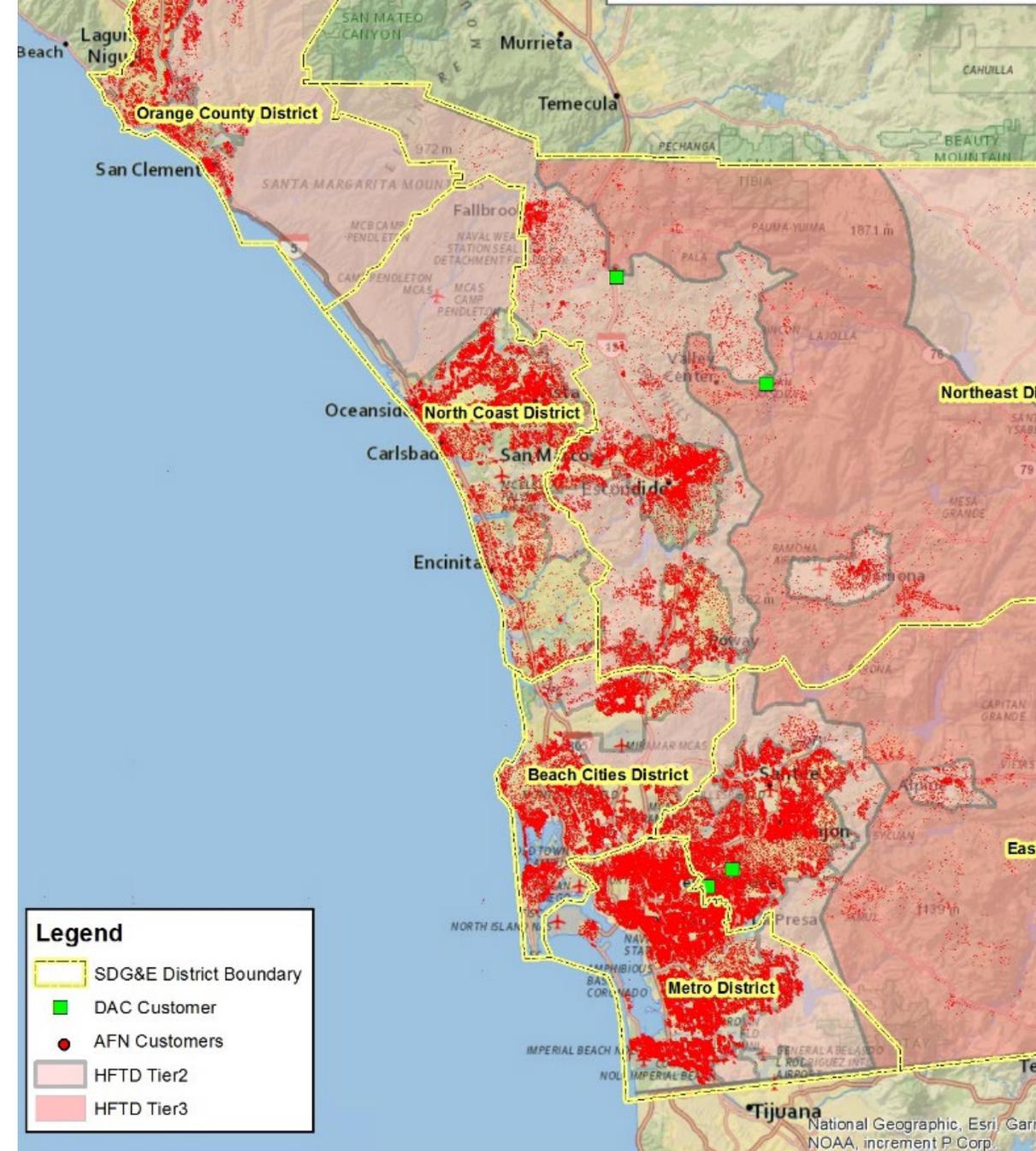
**Marketing + Research**  
Robust marketing campaign & dedicated AFN research panel. In-language support, & notification sign-ups

# AFN Customer Heat Map

*Using GIS data to provide targeted solutions, programs, community resource centers & more to AFN customers within the HFTD*

## Data Trends

- **32%** of SDG&E's residential population identified as **AFN**
- Identified AFN customers **increased by 7.5% in 2021** (~420K in 2021 vs ~387K in 2020)
- Significant increases in key segments:
  - Older adults 62+
  - Blind/low vision
  - Deaf/hard of hearing



# Wildfire Preparedness Outreach & Education

*Collaboration with stakeholders in the wildfire safety community to enhance community preparedness & wildfire resilience*

## 2021 Accomplishments:

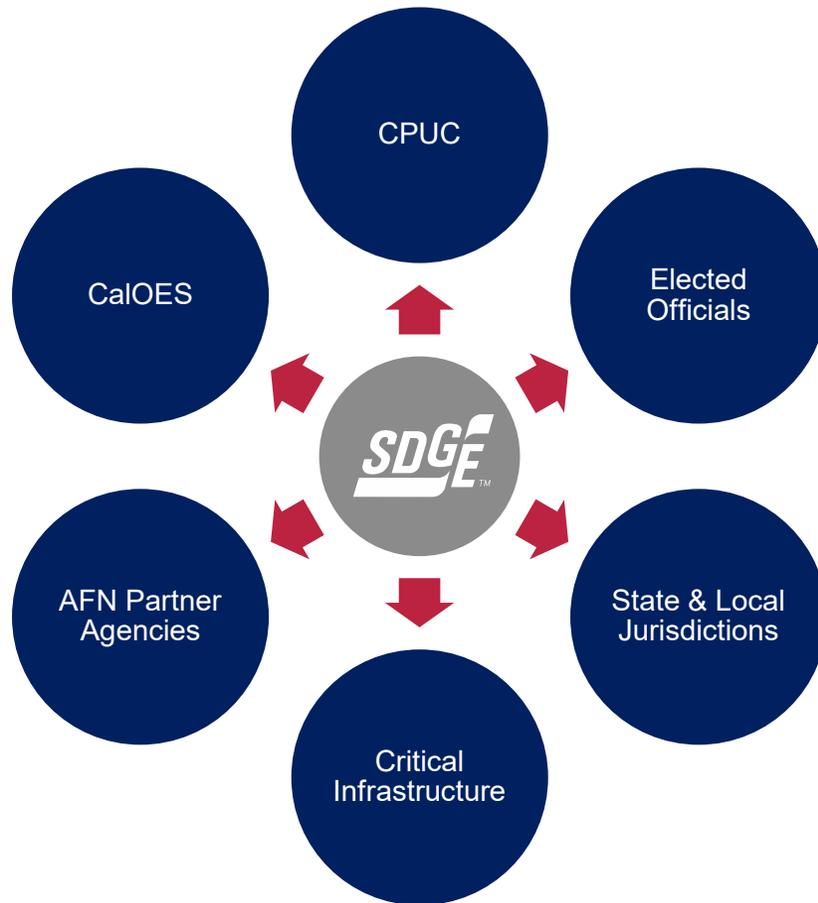
- 5 customer Wildfire Safety Webinars
- 6 drive-thru Wildfire Safety Fairs; **96% favorability rate**
- First joint SDG&E/tribal partner Wildfire Safety Fair
- Customer **favorability of 88%** for public education as relevant & meaningful

## 2022 Planning:

- Wildfire Safety Fairs, webinars & potentially integrate in-person Town Halls
- Expanded customized outreach to tribal communities & AFN customers
- Expand multi-channel engagement strategy
- Listening sessions/working groups – local governments, tribes, public safety partners, critical facilities & monthly 'Customer Listen' Surveys



# EOC Activation & Liaison Program



## Emergency Operations Center (EOC) Activations

- Enhanced functionality in virtual EOC environment
- Two physical EOC locations for redundancy
- PSPS Protocols activated 96-72 hrs prior to the period of concern
- EOC activates 12 hrs prior to the period of concern

## EOC Liaisons

- During a PSPS, not all partners activate their EOC
- SDG&E provides 24/7 liaisons to:
  - California Public Utilities Commission
  - Elected officials
  - State & local jurisdiction emergency managers
  - Tribal partners
  - Critical infrastructure
  - AFN partner agencies

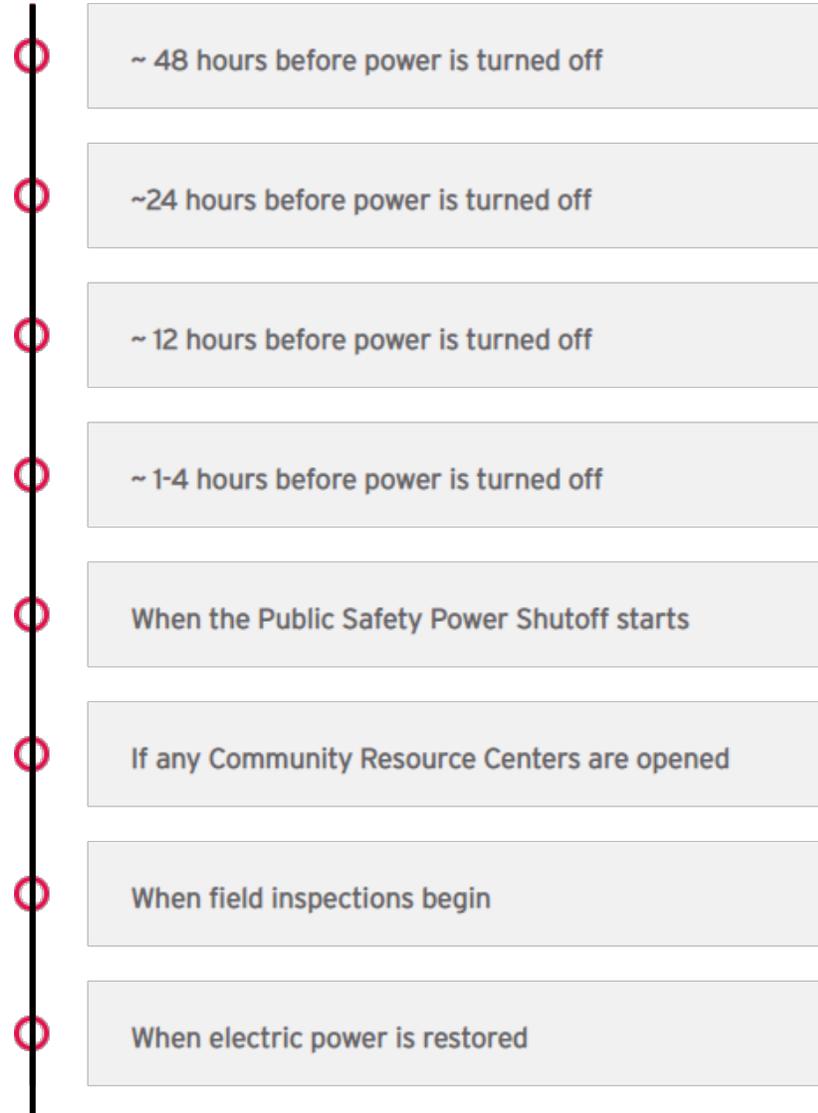
# PSPS Notifications

## 2021 Accomplishments:

- **Increased accessibility** of all notifications, including American Sign Language (ASL) video
- **Launched Public Safety Partner Portal.** 87% surveyed public safety partners satisfied with SDG&E communications
- **In-Community marquees** & electronic roadside message signs deployed in affected communities

## 2022 Planning:

- **Increased capacity** of outbound auto dialer system
- **Enhance Public Safety Partner Portal** to include mobile app push notification capability
- **Refine & expand** notification process & technology
- **Continued coordination** with regional public safety partners & CBOs to amplify messages



# PSPS Portal – Partner View



Page Updated: 2:56 PM, Sun 5/30/21

Public Safety Power Shutoffs are in effect.

**⚠** Potentially Impacted

5,293

Customers

655

Medical Baseline (MBL)

N/A

Critical Facilities

**!** Currently Impacted

1,538

Customers

112

Medical Baseline (MBL)

97

Critical Facilities

## Impacted Areas

Q Keyword Search

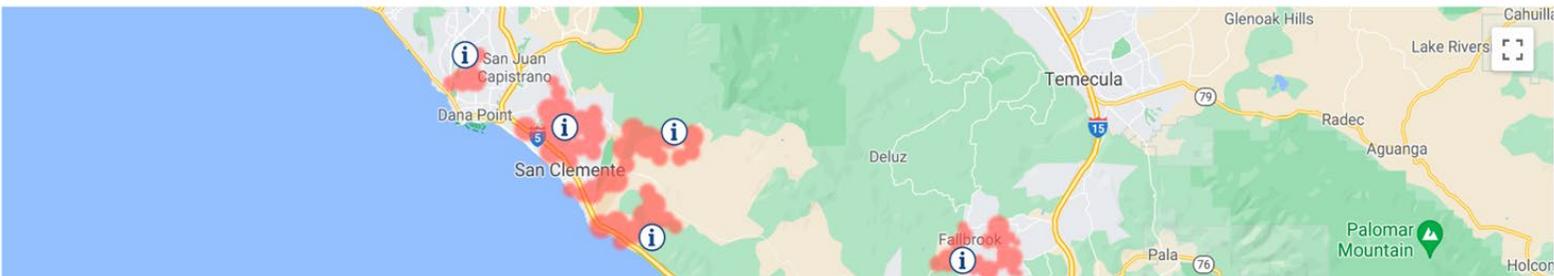
Filter by Status

Copy All Outage Information

Community Name	Status	Devices Affected	Copy
▶ Alpine		10 devices (2 currently impacted, 8 potential outage)	
▶ East San Juan Capistrano		10 devices (2 inspecting, 3 currently impacted, 5 potential outage)	
▶ Fallbrook		11 devices (8 inspecting, 3 currently impacted)	
▶ Oceanside		8 devices (8 potential outage)	
▶ San Clemente		3 devices (3 currently impacted)	

All dates and times are approximate.

## Outage Map



Search capabilities

Can show only one status at a time

Expandable rows

# PSPS Portal – Partner View



Public Safety Power Shutoffs are in effect.

Potentially Impacted

Currently Impacted

5,293

Customers

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Medical Baseline (MBL)

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97

Critical Facilities

## Impacted Areas

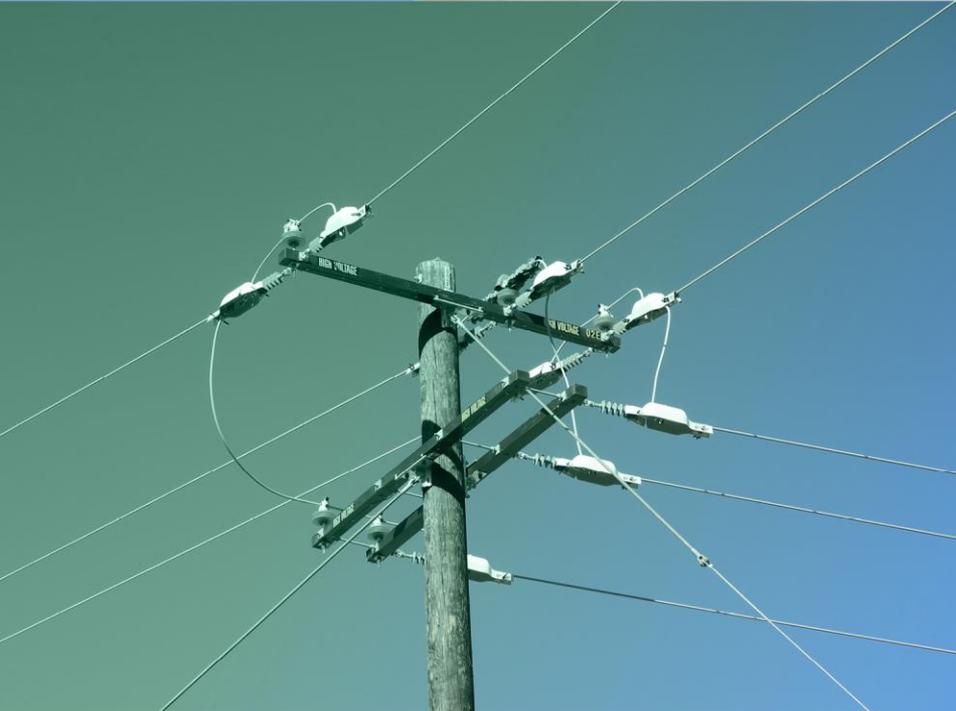
Keyword Search

Filter by Status

Copy All Outage Information

Community Name	Status	Devices Affected	Copy
Alpine		10 devices (2 currently impacted, 8 potential outage)	
Sectionalizing Device	Status	Est Outage Start Date/Time	Est Restoration Date/Time
73-765R	Currently impacted	Sun 5/30/21 at 3:30 PM PT	Mon 5/31/21 at 1:00-5:00 PM PT
1166-18R	Currently impacted	Sun 5/30/21 at 3:30 PM PT	Mon 5/31/21 at 1:00-5:00 PM PT
1458-454	Potential outage	Sun 5/30/21 at 3:00 - Mon 5/31/21 at 4:00 PM PT	Mon 5/31/21 at 1:00-5:00 PM PT
357-1299R	Potential outage	Sun 5/30/21 at 3:00 - Mon 5/31/21 at 4:00 PM PT	Mon 5/31/21 at 1:00-5:00 PM PT
367-1147R	Potential outage	Sun 5/30/21 at 3:00 - Mon 5/31/21 at 4:00 PM PT	Mon 5/31/21 at 1:00-5:00 PM PT
73-643R	Potential outage	Sun 5/30/21 at 3:00 - Mon 5/31/21 at 4:00 PM PT	Mon 5/31/21 at 1:00-5:00 PM PT
78-26R	Potential outage	Sun 5/30/21 at 3:00 - Mon 5/31/21 at 4:00 PM PT	Mon 5/31/21 at 1:00-5:00 PM PT
AL-12KV-355	Potential outage	Sun 5/30/21 at 3:00 - Mon 5/31/21 at 4:00 PM PT	Mon 5/31/21 at 1:00-5:00 PM PT
AL-12KV-357	Potential outage	Sun 5/30/21 at 3:00 - Mon 5/31/21 at 4:00 PM PT	Mon 5/31/21 at 1:00-5:00 PM PT
LL-12kV-1166	Potential outage	Sun 5/30/21 at 3:00 - Mon 5/31/21 at 4:00 PM PT	Mon 5/31/21 at 1:00-5:00 PM PT
East San Juan Capistrano		10 devices (2 inspecting, 3 currently impacted, 5 potential outage)	
Fallbrook		11 devices (8 inspecting, 3 currently impacted)	
Oceanside		8 devices (8 potential outage)	

Each community now has several rows nested underneath to display incoming sectionalizing device data



**2022**  
**WILDFIRE MITIGATION**  
**PLAN UPDATE**

# Agenda

Presenter: Tom Brady – Principal Manager, Wildfire and PSPS Response

## Topics



- 1 → 2021 PSPS in Review
- 2 → 2021-2022 PSPS Mitigation Activities
- 3 → 2022 Planning Summary

# 2021 In Review



45%

Reduction in PSPS duration as a result of 2021 mitigation measures



~1,500

Miles of covered conductor deployed; 700 miles of expedited grid hardening



81,000

Customers removed from scope through exceptions and switching protocols



73%

Reduction in PSPS duration for the most frequently impacted circuits (FICs)\*



72%

Reduction in scope on FICs\*



49%

Reduction in event frequency on FICs\*

\*January '21 event is considered part of 2020 season as it was driven by 2020 weather and fuel conditions and managed with 2020 tools and capabilities

# 2021 In Review

**6,741**

Critical Care backup  
**batteries** deployed  
since program  
inception

**2,706**

Customers visited  
Community  
Resource Centers or  
Community Crew  
Vehicles

**8.8/10**

Satisfaction rating  
from CRC/CCV  
visitors who  
responded to our  
survey

**100+**

Virtual meetings  
with our  
communities and  
partners in 2021

**1,600**

CBOs received  
monthly  
information from  
SCE to share

**124**

Public safety  
**partners** met with us  
to discuss  
concurrent  
emergency policies

\*January '21 event is considered part of 2020 season as it was driven by 2020 weather and fuel conditions and managed with 2020 tools and capabilities

# 2021 In Review

ACTIVATION STATS	PSPS Activations	# Customers De-energized	# Circuits De-energized	Customer Minutes of Interruption (CMI)
2020 Fire Season	13	~348k	584	~388M
2021 Fire Season	9	~85k	124	~105M
IMPROVEMENT	↓31%	↓76%	↓79%	↓73%

The event data shown here is based on current, non-final numbers as of February 23, 2022. SCE is in the process of reviewing the data.

# 2021-22 PSPS Mitigation Activities

## 2021 Improvements Tied to Mitigations

- Customer Minutes of Interruption (CMI) **reduced by 45%**
- Customers de-energized **reduced by 44%**
- Circuits de-energized **reduced by 33%**

## 2021 Achievements

- Expedited grid hardening reduced the need for PSPS on the 72 FICs through:
  - Installing covered conductor
  - Increasing circuit segmentation
  - Adding weather stations
  - Updating switching/operational protocols
- Updated covered conductor wind-speed de-energization thresholds from 31mph (sustained)/46 mph (gust) to 40/58 mph

## 2022 Activities

- Currently planned for 2022:
- ~1,100 miles of new covered conductor
- Ongoing circuit exceptions review
- 15 Overhead Remote-Control Switches (RCS)/ Remote Automatic Reclosers (RAR)
- RCS conversion of existing switches, new underground RCS installations, and new RAR installations
- 150 weather stations
- Evaluate additional circuits that were de-energized during the 2021 Thanksgiving event for grid hardening activities.

January '21 event is considered part of 2020 season as it was driven by 2020 weather and fuel conditions and managed with 2020 tools and capabilities

# 2021-22 PSPS Mitigation Activities

## 2021 COMMUNITY CARE RESOURCES

### 64 COMMUNITY RESOURCE CENTERS (CRC)

Contracted and available based on potential shutoff locations. Location and hours listed online before shutoffs

### 8 COMMUNITY CREW VEHICLES (CCV)

Can be deployed rapidly for remote locations. Location and hours listed online before shutoffs

### 7 RESILIENCY ZONE SITES

Enable backup power generation at certain essential sites in remote communities

### 9 RESILIENT CRCs

CRCs that have or are in the process of installing a transfer switch and/or have a backup generator



Thanksgiving Day, 2021

## 2021 Achievements

- Deployed 6,021 Critical Care backup batteries (CCBB)
- Added CRC survey in QR code format to enable onsite feedback from visitors

## 2022 Activities

- Support increased deployment of CRCs/CCVs
- Target 2,750 new CCBB deployments
- Continue rebate program for portable batteries/generators
- Launch in-event battery loan pilot
- Increase accessibility and resources offered to AFN customers

# 2022 PSPS Planning Summary

USE **PSPS** ONLY  
WHEN  
NECESSARY  
**TO PROTECT  
PUBLIC  
SAFETY** UNDER  
SIGNIFICANT  
FIRE-RISK  
WEATHER  
CONDITIONS

<b>Reduce the Use of PSPS</b>	<ul style="list-style-type: none"><li>• Continue grid hardening and circuit exception activities</li><li>• Evaluate 2021 most-impacted circuits for grid hardening prioritization</li></ul>
<b>Execute PSPS Events Effectively</b>	<ul style="list-style-type: none"><li>• Develop ~500 additional machine-learning weather models</li><li>• Complete end-to-end process and system automation</li><li>• Conduct monthly trainings and exercises to prepare for activation</li></ul>
<b>Mitigate the Impacts of PSPS</b>	<ul style="list-style-type: none"><li>• Build out CRC availability through staffing and logistics</li><li>• Continue to refine customer care programs</li><li>• Expand programs and outreach for AFN customers</li></ul>
<b>Inform Partners and Customers</b>	<ul style="list-style-type: none"><li>• Improve customer and partner notification accuracy and timeliness through automation</li><li>• Build customer resiliency through distribution of 2022 preparedness newsletter</li><li>• Continue community and partner meetings</li></ul>
<b>Improve Post Event Reporting</b>	<ul style="list-style-type: none"><li>• Fully automate in-event/post-event data flows for more accurate and timely reporting</li></ul>

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Thank You