PUBLIC SAFETY POWER SHUTOFF

2022 Post-Season Briefing

April 18, 2023

SOUTHERN CALIFORNIA EDISON®

AGENDA

TOPIC	SPEAKER
Introduction: Reducing Wildfire Risk and PSPS Impacts	**Shinjini Menon** Vice President Asset Management and Wildfire Safety
PSPS Overview Comparison: Year-over-year Performance and Execution	
Lessons Learned: How 2022 Experience Informs Continuous Improvement; Learnings from Thanksgiving Activation	**Tom Brady** Principal Manager Wildfire and PSPS Response
Fire Weather Forecasting: • Advancing our Modeling and Weather Forecasting Capabilities • Notifications and Machine Learning Improvements	
Notifications and Communications: • Notification Challenges and Improvements • Informing Customers and Partners • SCE.com and Public Safety Partner Portal Updates • Stakeholder Engagement, Including Public Education and Outreach	**Michael Williams** Principal Manager Customer Engagement Division
2022 PSPS Survey Results: What our Customers are Saying About SCE and PSPS	
Customer Programs and Support: • Customer Care Resources and Offerings • Customer Education and Outreach	**Valarie Hernandez** Principal Manager Customer Care
PSPS and Fast Curve Settings: Two Distinct Tools for Mitigating Wildfire Risk	**Ray Fugere** Director Wildfire Safety
Closing: Looking Ahead to 2023	**Shinjini Menon**

Introduction
Overview

Shinjini Menon
Vice President
Asset Management
& Wildfire Safety

REDUCING WILDFIRE RISK
MILESTONES TO DATE AND COMPARISON OF 2021 AND 2022 RISK CONDITIONS

~4,400 MILES
OF COVERED CONDUCTOR

1.9 MILLION+
TRIMS AND REMOVALS

1 MILLION+
HFRA INSPECTIONS

1,620+
WEATHER STATIONS

180+
HD CAMERAS

Completed in high fire risk areas (HFRAs) since 2018 through 2022

	2021	2022
Estimated Risk Reduction	Probability of catastrophic* wildfires associated with our equipment reduced by about **65-70%** since 2018	Probability of catastrophic* wildfires associated with our equipment reduced by about **75-80%** since 2018
Grid Hardening Progress	• Installed **~1,500** circuit miles of covered conductor ○ **31%** of overhead distribution lines in HFRA as of 2021 • Completed **~6 miles** of targeted undergrounding	• Installed **~1,400** circuit miles of covered conductor ○ **46%** of overhead distribution lines in HFRA as of 2022 • Completed **~15 miles** of targeted undergrounding
CPUC-Reportable Ignitions in HFRA	48	41

* A wildfire directly causing one or more deaths, damaging or destroying more than 500 structures, or burning more than 140,000 acres of land

PSPS PERFORMANCE AND EXECUTION COMPARISON
COMPARISON OF 2021 AND 2022 PSPS ACTIVATIONS

ACTIVATION STATISTICS	Total PSPS activations	Activations with de-energized customers	# Customers de-energized[2]	# Circuits de-energized[3]	Customer Minutes of Interruption (CMI)
2021	10	8	179,502	232	~222M
2022	6	3	15,784	13	~7M
Improvement[1]	↓**40%**	↓**63%**	↓**91%**	↓**94%**	↓**97%**

[1] Relatively mild fuel and fire weather year in 2022 and SCE's mitigations (e.g., increased thresholds from grid hardening and switching protocols) drove 2022 improvements
[2] Number of customer outages associated with PSPS (if multiple PSPS outages impact the same customer, count each outage as a separate "customer de-energization")
[3] Number of circuits de-energized per PSPS activation (If multiple PSPS outages impact the same circuit, count each circuit as a separate "circuit de-energization")

Lessons Learned
Fire Weather Forecasting

Tom Brady
Principal Manager
Wildfire and PSPS Response

LESSONS LEARNED IN 2022

Lesson Learned	SCE Actions
Data Challenges: Identified gaps and discrepancies in customer data (not unique to PSPS) that impacted notifications and reporting	• SCE Customer Service team developing engagement strategy to address missing/incorrect customer contact information and ensure customers are enrolled in PSPS alerts • Validating customer-to-circuit mapping to ensure proper assignment
Data System Limitations: Manual intervention was required for in-event notifications and post-event reporting, contributing to missed notifications and necessitating post-event report amendments	• Build out automated notification dispatch processes to reduce manual touchpoints • Reduce cycle time for processing notification workflows • Automate notifications for primary-metered and sub-transmission customers • Validate definitions of key PSPS metrics to ensure consistent reporting • Further automate data tables and metrics in post-event reports
Weather Forecasting Limitations: Emergent weather conditions prevented timely notification for some customers, including during November 19 activation	• Continuing to enhance weather forecasting through machine learning
Best Practices from Thanksgiving Activation to Reduce Customer Impacts: Early and proactive planning increased flexibility and response effectiveness	• Mitigated customer impacts by pre-positioning field teams and customer care resources, prioritizing early restoration planning, and providing gift cards for customers at CRCs • Safely restored customers same day • Minimized de-energizations through additional circuit segmentation • Evaluating circuits de-energized in 2022 for accelerated grid hardening

Best-in-Class Accuracy for 2023

SCE's wind forecast error across all internal models for day-of wind forecasts are accurate to within **2-3 MPH for sustained winds** and **3-4 MPH for wind gusts** (as of 2023)

For comparison, this **exceeds the accuracy of the National Weather Services' National Blend of Models**, which has a forecast error of 3.5-4.5 MPH for sustained winds and around 7 MPH for wind gusts

Planned Weather Forecasting Model Improvements for 2023

- Expanding machine learning (ML) capabilities from **564** locations to **1164** locations and testing new ML training methods to increase forecast accuracy

- Investigating new analog forecast techniques to **forecast** based upon **prior known outcomes**

- Refreshing internal **climate data** to help identify areas of bias in the models

In-Event Risk Calculator

- In-Event Risk Calculator helps Incident Commanders make more informed de-energization decisions by weighing the risk of de-energization impacts to our customers against the impact of a potential wildfire to the communities we serve

- In 2022, we automated and integrated the results of the In-Event Risk Calculator into our Central Data Platform (CDP), improving efficiency by eliminating need for manual entry
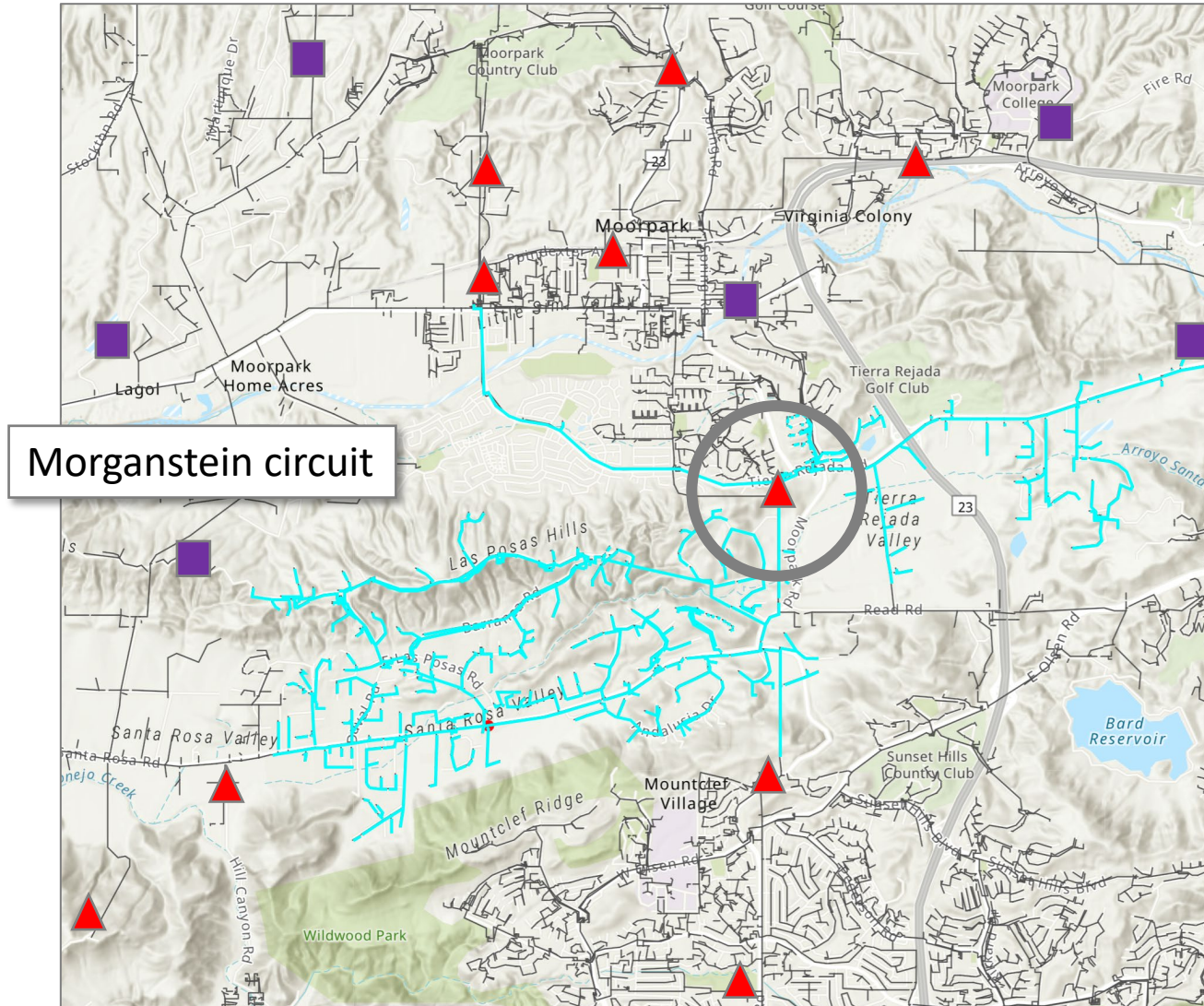

Keisha Drive on Morganstein circuit
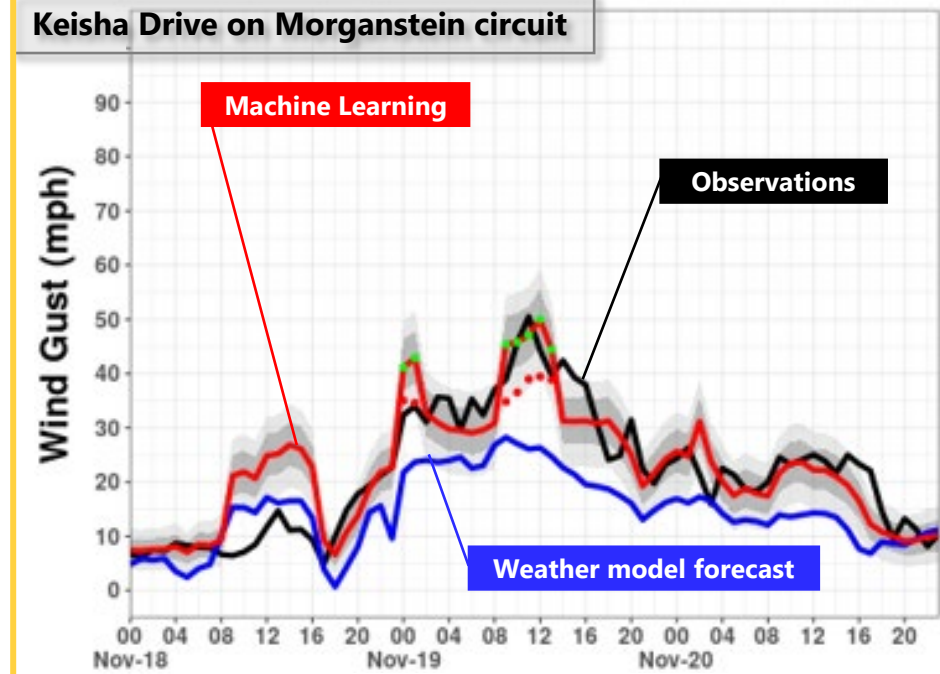
New machine learning model developed for Keisha Drive weather station (where notifications were missed) provides better fit to observations.

Morganstein circuit

More than doubling machine learning sites to aid SCE in decision-making at locations with unique and complex geography

○ SCE's weather station at Keisha Drive, where we missed de-energization notifications on November 2022

■ Existing machine learning forecast locations

▲ New machine learning sites under development for 2023 to improve forecast accuracy

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Notifications & Communications

2022 PSPS Survey Results

Michael Williams
Principal Manager
Customer Engagement Division

Customer Contact Updates

- In 2021, identified **247,000** HFRA customers who were not enrolled in emergency notifications
  - Launched data cleansing and auto-enrollment to capture **98%** of accounts, and working to identify remaining 2%

- Removed the opt-out feature to keep customers enrolled for emergency notifications

Notification Improvements

- Successful notifications to Medical Baseline Customers via automated initial notifications, secondary attempts and Field Services door rings
- Automation improved the timing and accuracy of notifications—machine learning should reduce occurrence of missed notifications due to emergent weather
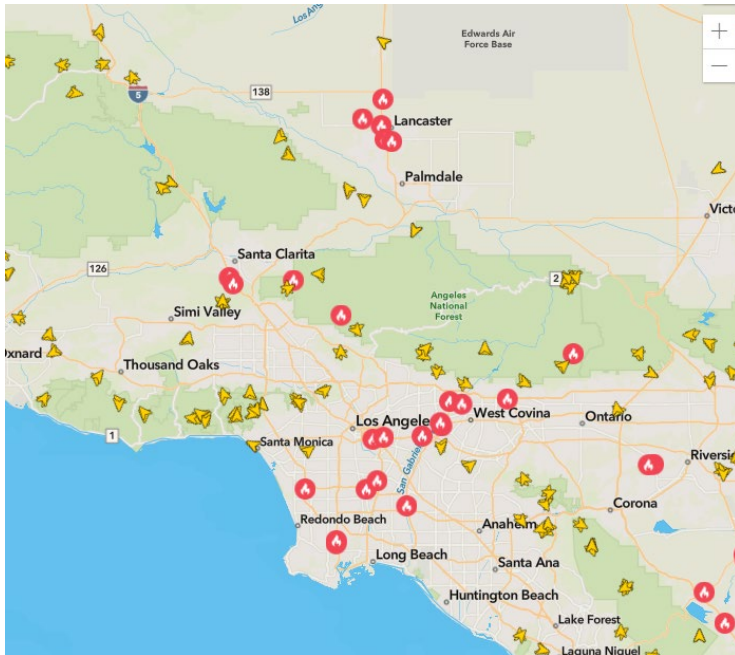- **77,586** sign ups for Address Level Alerts since 2021 launch

SCE.COM & PSPS PORTAL
IMPROVING TRANSPARENCY FOR CUSTOMERS AND SAFETY PARTNERS

Weather/Fire Detection Map

Interactive fire/weather map provides key situational awareness across SCE's service area:
- Weather watches/warnings
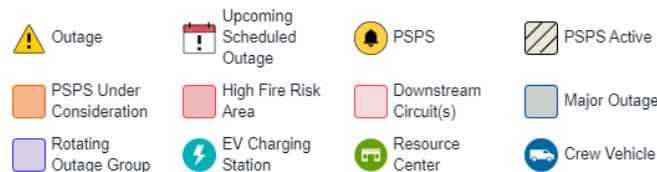- Weather stations
- HD Cameras
- Fire detections

www.sce.com/wildfire/situational-awareness

SCE.com Outage Map

Increased functionality:
- Added search by meter number
- Locate EV charging stations

County of Los Angeles, California State Parks, Esri, HERE, Garmin, SafeGraph, FAO, METI/...   Powered by Esri

⚠️ Outage	📅 Upcoming Scheduled Outage	🔔 PSPS	▨ PSPS Active
PSPS Under Consideration	High Fire Risk Area	Downstream Circuit(s)	Major Outage
Rotating Outage Group	⚡ EV Charging Station	🚐 Resource Center	🚓 Crew Vehicle
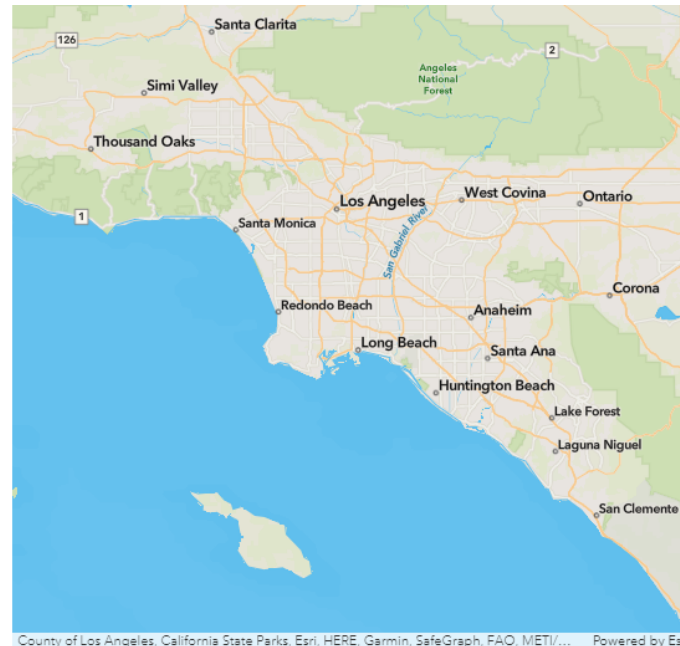
PSPS Public Safety Partner Portal

- **850+** registered Portal users
- Monthly Portal office-hours with deep-dive topics
- Data refresh and update to add meter details started in 2022 and to continue in 2023
- Enhancing planning and in-event functionality in 2023
- Annual re-certification process for all

Planning map
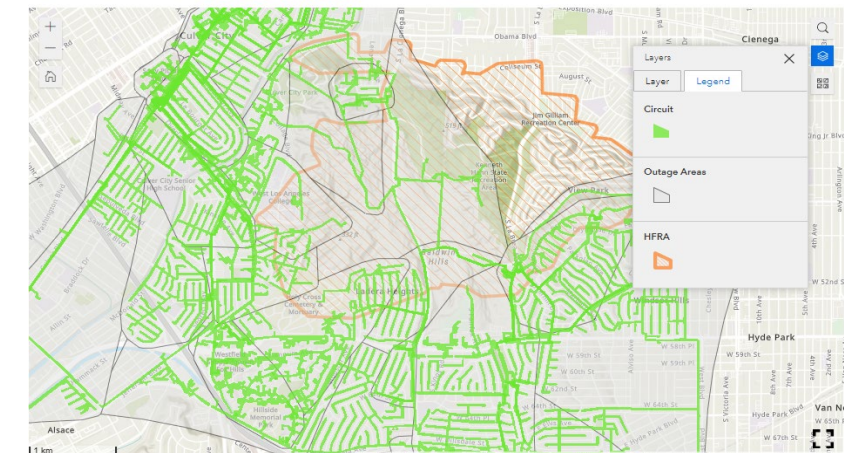
INFORMING CUSTOMERS AND PARTNERS
OUTREACH TO CUSTOMERS AND TRIBAL / LOCAL GOVERNMENTS

In 2022 we built on feedback to better communicate, coordinate and share information with our Tribal and local government partners

140 Local and Tribal government PSPS guides distributed (all HFRA local and Tribal governments)

89 Meetings with Local and Tribal Governments (including all HFRA local and tribal govts that requested a meeting)

9 PowerTalk Meetings

11 Critical Infrastructure Workshops

16 PSPS Working Group and Advisory Board Meetings

9 County OA meetings covering all 13 HFRA counties

Engaging with all local and Tribal governments in HFRAs
- Updated tools and resources available before/during PSPS events such as PSP Portal, websites and in-event contacts
- Provided resources to local/Tribal governments in order to assist with increasing program enrollment and notification sign-up
- Sought feedback from local and Tribal governments, including on PSPS notifications and Community Resource Centers
- Targeted partnership with Tribal nations, including hosting a tailored PSPS workshop and inviting leaders to EOC Tours to both share information and solicit feedback about PSPS response
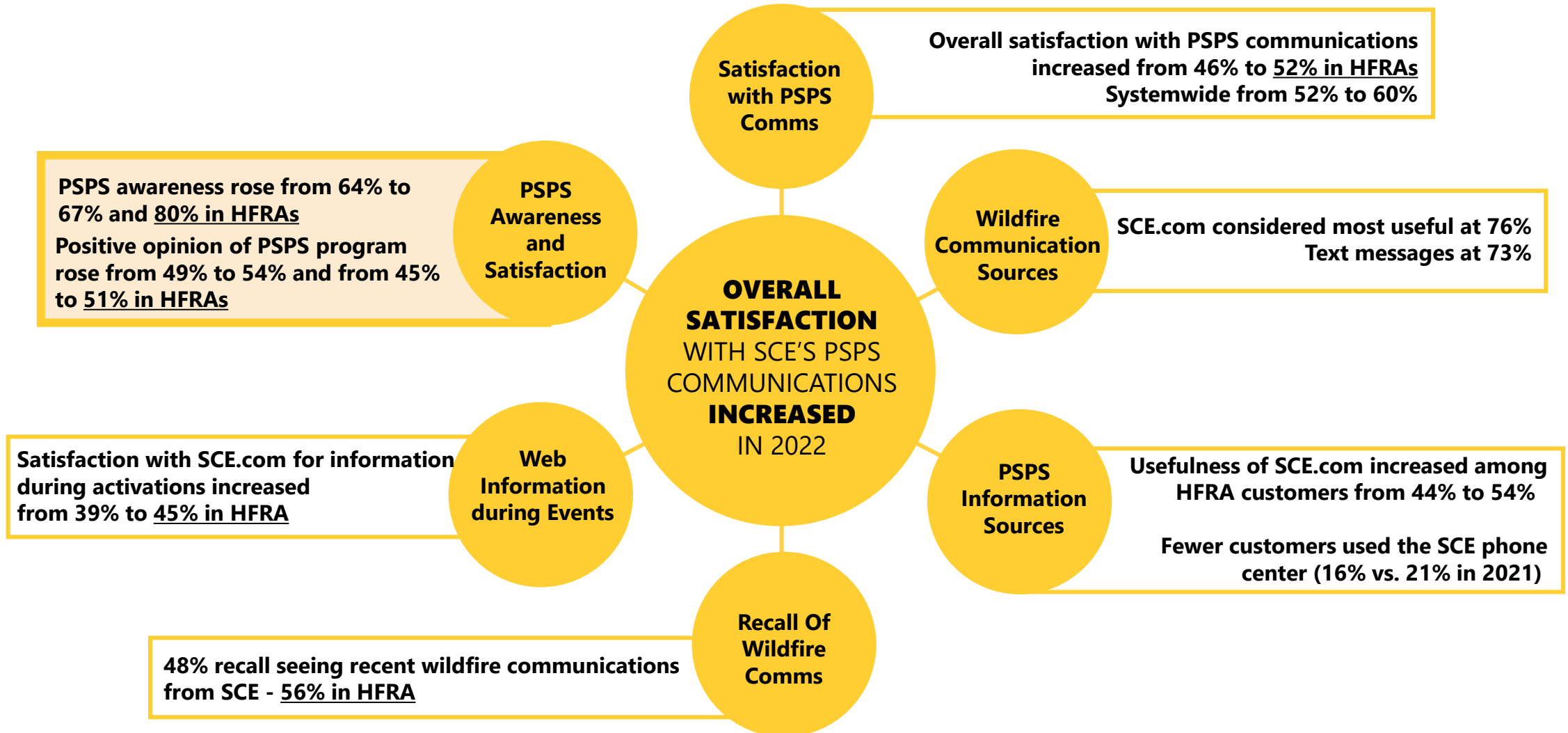
2022 Survey of local and Tribal government Stakeholders in HFRA

97% Familiar with or heard of SCE's work to reduce wildfire risk

98% Familiar with or heard of SCE's PSPS Program

79% Support SCE's PSPS Program

2022 PSPS SURVEY RESULTS

Satisfaction with PSPS Comms

Overall satisfaction with PSPS communications increased from 46% to <u>52% in HFRAs</u> Systemwide from 52% to 60%

PSPS Awareness and Satisfaction

PSPS awareness rose from 64% to 67% and <u>80% in HFRAs</u>
Positive opinion of PSPS program rose from 49% to 54% and from 45% to <u>51% in HFRAs</u>

OVERALL SATISFACTION WITH SCE'S PSPS COMMUNICATIONS **INCREASED** IN 2022

Wildfire Communication Sources

SCE.com considered most useful at 76% Text messages at 73%

Web Information during Events

Satisfaction with SCE.com for information during activations increased from 39% to <u>45% in HFRA</u>

PSPS Information Sources

Usefulness of SCE.com increased among HFRA customers from 44% to 54%

Fewer customers used the SCE phone center (16% vs. 21% in 2021)

Recall Of Wildfire Comms

48% recall seeing recent wildfire communications from SCE - <u>56% in HFRA</u>

Customer Programs & Support

Valarie Hernandez
Principal Manager
Customer Care

CUSTOMER CARE RESOURCES
SUPPORTING MEDICAL BASELINE CUSTOMERS AND THOSE WITH ACCESS & FUNCTIONAL NEEDS

AFN Resources

- 211 contract; direct partnerships with food banks
- Self-ID survey campaign
- Heat map resource
- New partnerships with community-based organizations (CBOs) who focus on AFN
- Collaboration with In-Home Support Services (IHSS)

MBL Improvements

- Automated all-customer email enrollment campaign
- Resolved missing MBL contacts for emergency notifications

IN-EVENT SUPPORT

AFN RESOURCES

BACK-UP BATTERIES

Overall Satisfaction 8.8 of 10

Piloted Starlink satellite device to provide internet connectivity
New on-site AFN-focused resources: wheelchairs, privacy screens
Piloted leave-behind medical device charging service

63 CRC sites / 8 CCVs activated 38 times with ~1,750 visitors
8 Resiliency Zones in rural communities, SCE-provided back-up generation and security upon activation

98% Overall Satisfaction with Critical Care Backup Battery Program

3,466 free portable backup batteries deployed in 2022
Expanded eligibility to all MBL customers in HFRA
Partnered with CBOs to increase program awareness

Issued **3,129** portable power station/generator rebates
Increased rebate amounts: $150 portable power stations; portable generators $600 CARE/FERA/MBL, $200 for all others

Partnerships with CBOs

- CBOs shared wildfire safety and PSPS information with over **500K constituents** via social, email and meetings
- Constituents received **in-language** information on preparedness tips, outage alerts sign up, customer assistance programs and other related topics
- CBOs attended **quarterly update workshops** with SCE's dedicated AFN team

Medical Baseline Outreach

- Ads in **40 newspapers** (1x insertion in May, 1x insertion in June) to reach older in-language audiences who may be harder to reach online
- **Digital and social media ads** May-December in English, Spanish, Chinese, Korean, Tagalog and Vietnamese

Advertising Efficacy Year-to-Date

- **53% recall** of PSPS Messaging
- **67% agree** SCE takes proactive measures to protect communities from wildfires

Advertising targets broad audiences through a mix of channels. January-May ads were focused on HFRA – messaging expanded to entire SCE service-area in June

2022 Advertising Channels

Earned media	Paid media
- Media relations: **80 outlets** ~**100** journalists - Newsletter - CBO/AFN outreach - Energized - Wildfire preparedness in schools - Social (organic)	- Digital: banners, streaming video/audio - Radio - Search - Social

PSPS &
Fast Curve Settings

Ray Fugere
Director
Wildfire Safety

PUBLIC SAFETY POWER SHUTOFFS VS. FAST CURVE SETTINGS

PSPS and fast curve settings are two wildfire mitigation tools that are complimentary and should not be viewed as alternatives

Criteria	PSPS	Fast Curve Settings
When We Deploy	Fire Weather Threat - Fire Potential Index (FPI) and windspeed thresholds are exceeded	Red Flag Warning Days Fire Climate Zone Threat Fire Weather Threat Thunderstorm Threat
Risk Reduction	PSPS could have reduced the number of structures damaged by past fires by more than 90%	~54% reduction in ignition-to-fault ratio of circuits with fast curve enabled compared to circuits without fast curve enabled
Action	Turn off power proactively to prevent faults from occurring as a tool of last resort	Increase relay sensitivity when a fault is detected
Outage Duration	Depends on period of concern, patrols and required repairs	Depends on patrols and required repairs

LOOKING AHEAD TO 2023 SEASON

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

Reduce the Use of PSPS	• Improved forecasting • Continued grid hardening
Execute PSPS Events Effectively	• Automation updates to reduce notification misses and improve reporting • Optimizing CRC locations to provide additional customer coverage • Threshold examination
Mitigate the Impacts of PSPS	• New partnerships with CBOs who focus on AFN • Starlink devices at CRC locations for customer communication • Continue CCBB program • Continue portable power station/generator rebates
Inform Partners and Customers	• PSPS preparedness education, outreach and community engagement with particular emphasis on mitigating impacts to vulnerable customers.
Improve Reporting	• Automation and data governance

THANK YOU