SDGE™
& WILDFIRE SAFETY

2022 WMP Energy Safety Workshop

March 10, 2022

Agenda

1. Grid Design & System Hardening

2. Risk Modeling & Assessment

3. Vegetation Management

4. Public Safety Power Shutoffs

5. Asset Management & Data Governance

2021 Wildfire Mitigation Plan Results

Undergrounding	**25.9/25.0** Miles installed in 2021	**104%** Complete	**56** Miles Installed since 2020	**Situational Awareness**	**17/17** Cameras Installed in 2021	**21** total since 2020	**46/25** Weather Stations Upgraded in 2021	**221** total since 2020
Covered Conductor Installation	**20.6/20.0** Miles installed in 2021	**103%** Complete	**22.5** Miles Installed since 2020	**Aerial Fire Suppression**	**793k** Gallons dropped YTD (2021)		**1.59M** Total gallons dropped since 2020	
Traditional Hardening	**117/116** Miles installed in 2021	**101%** Complete	**321.5** Miles Installed since 2020	**Enhanced Vegetation Management**	**12,578/17,000** Trees trimmed removed in 2021		**74%** Complete	**29,653** Trees removed / trimmed since 2020
Asset Install/Replacement	**8,052/7,176** Asset installed/ Replaced in 2021	**112%** Complete	**13,322** Installed/Replaced since 2020	**Distribution Inspections**	**168k/ 169k** Inspections since 2021		**99%** Complete	**350k** Inspections completed since 2020
Generators	**3,404/3,013** Generators provided to eligible customers in 2021	**113%** Complete	**6,173** Generators provided since 2020	**Transmission Inspections**	**17,711/19,638** Inspections completed in 2021		**90%** Complete	**43,247** Inspections completed since 2020

Grid Design & System Hardening

Shaun Gahagan
Manager, Wildfire Mitigation

Grid & Infrastructure Hardening

Transmission

- By the end of 2023, **100% of SDG&E's transmission system** in Tier 3 of the HFTD will be **hardened**
- **84%** risk event reduction
- Falling conductor protection will be implemented on transmission

Strategic Undergrounding

- SDG&E is **the first IOU** to apply wildfire mitigation undergrounding of overhead lines inclusive of secondaries & services in the HFTD
- **98%** risk event reduction
- 25+ miles completed in 2021
- **65 miles planned in 2022**

Covered Conductor

- **> 900 / 3,500 miles (25%)** of overhead distribution lines in the HFTD have been hardened with bare wire and begun transition to covered wire
- **65%** risk event reduction
- 20 miles completed in 2021
- **60 miles planned in 2022**
- Continued falling conductor protection

Asset Replacement Programs

Expulsion Fuse Replacement

3,976 / 3,970
Completed in 2021

100%
Complete

98%
HFTD Completion

Capacitor Replacement

35 / 32
Completed in 2021

109%
Complete

41%
HFTD Completion

Hot Line Clamp Replacement

2,743 / 2,250
Completed in 2021

122%
Complete

67%
HFTD Completion

Lightning Arrester Replacement

1,789 / 1,400
Completed in 2021

128%
Complete

4%
HFTD Completion
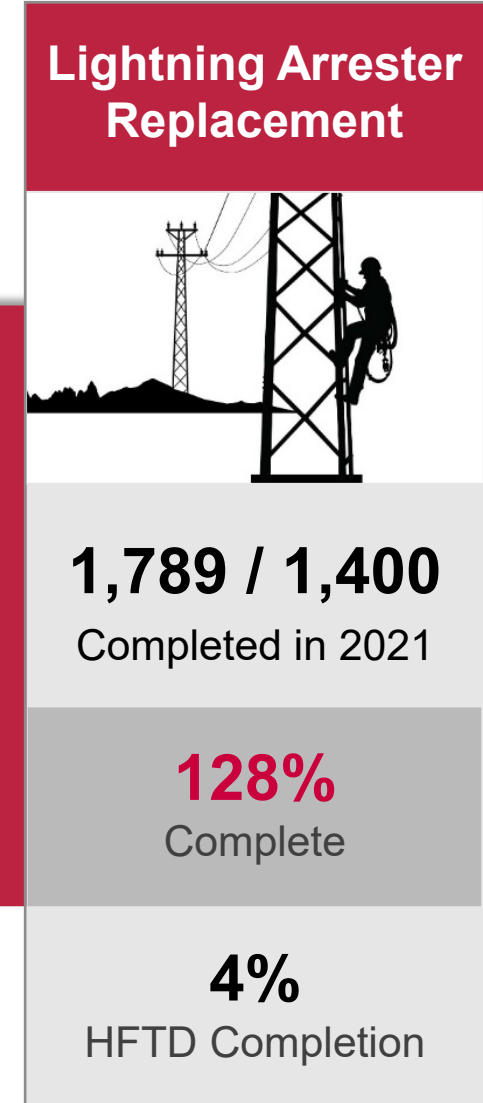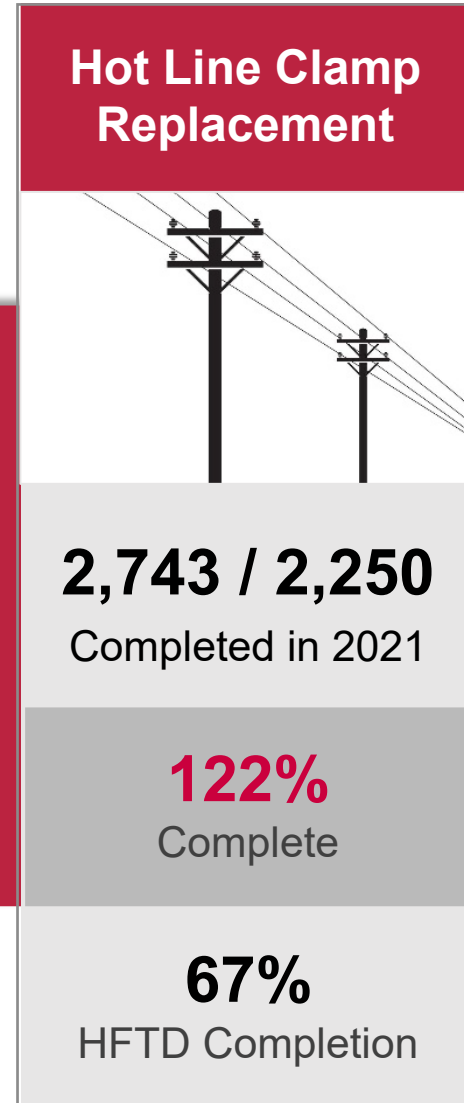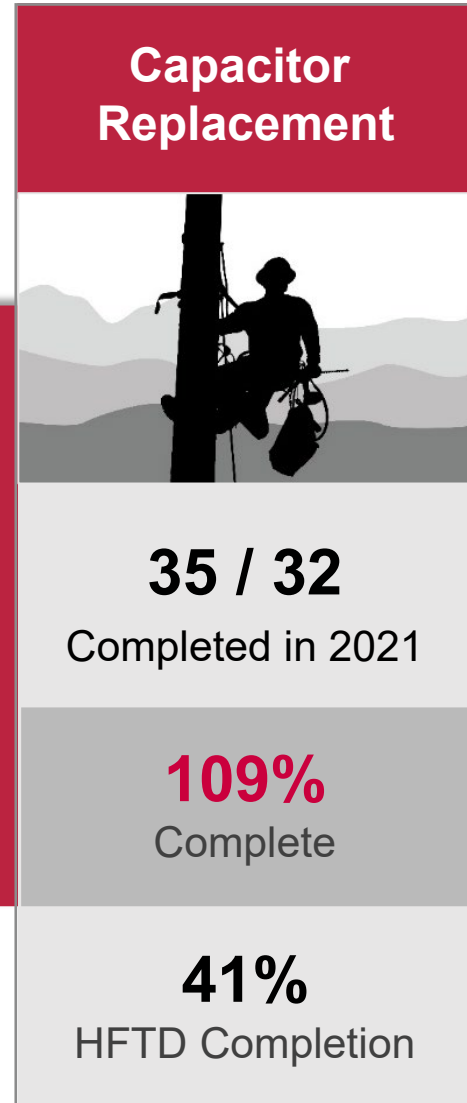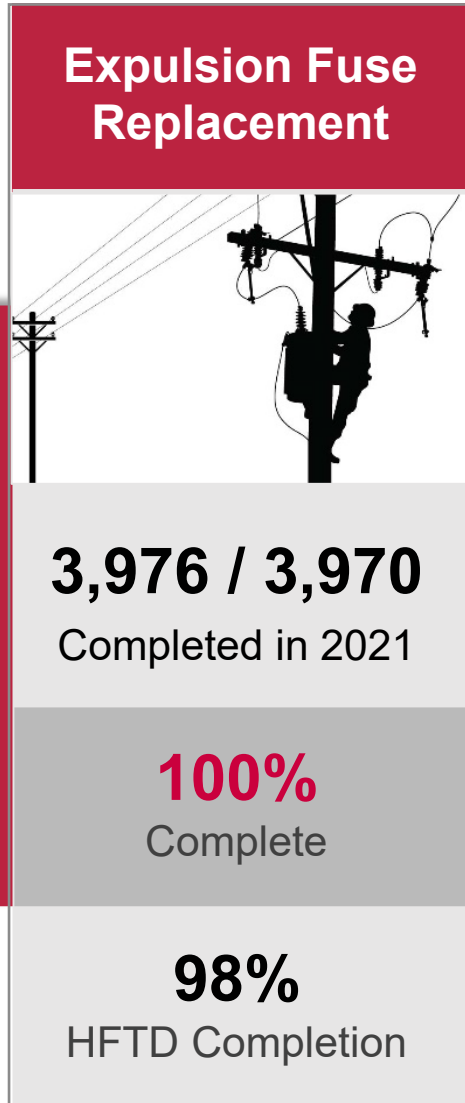
Advanced Protection

Early Fault Detection

- Utilize sensors to detect faults prior to the asset failing
- 17 sensors installed on demonstration circuit

Falling Conductor Protection

- High speed relays de-energize broken conductors before contact with ground
- 10 circuits active in Tier 3

Sensitive Relay Settings

- Fast relay settings enabled during PSPS or Extreme FPI
- Reduce fault energy during highest risk conditions

Distribution Communications Reliability Initiative

- Improve network availability, reliability & performance
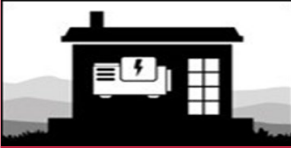- 25 Base Stations installed; 70 planned through 2024
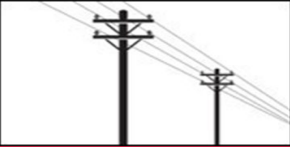
PSPS Mitigations – Projections & Results

Reduced Number of Customers Impacted

3-Year Projected Total	2022 Projected Total	2021 Total	2020 Total
39,533	11,695	13,359	14,479

	2022 Projections	2021 Results	2020 Results		2022 Projections	2021 Results	2020 Results
PSPS Sectionalizing	10 Locations / 4,607 Customers	11 Locations / 9,719 Customers	23 Locations / 12,870 Customers	**Standby Power Programs**	300 Customers	353 Customers	32 Customers
Strategic Undergrounding	65 Miles / 2,533 Customers	26 Miles / 242 Customers	15.5 Miles / 276 Customers	**Generator Grant Programs**	3,000 Customers	2,310 Customers	1,300 Customers
Microgrids	2 Locations / 5 Customers	0 Locations / 0 Customers	6 Locations / 578 Customers	**Generator Assistance Programs**	1,250 Customers	735 Customers	

Microgrids & Temporary Generators

Continued investment in sustainable solutions that provide resiliency to customers impacted by a PSPS

2021 Accomplishments:

• Significant progress at Cameron Corners. Necessary adjacent undergrounding completed

• Construction completed at CAL FIRE's Ramona Air Attack Base

• Introduced mobile battery energy storage units to replace diesel temporary generators & provide mobile EV charging at Community Resource Centers

2022 Planning:

• Commissioning of Ramona Air Attack Base & Cameron Corners microgrids

• Complete land acquisition for Butterfield Ranch & Shelter Valley locations, with issuance of request for proposals for construction contracts

• Design & engineering of additional microgrid sites identified from WiNGS modeling

• Continue to explore mobile battery energy storage units in different applications & uses to verify robustness and flexibility

Backup Generator & Battery Programs

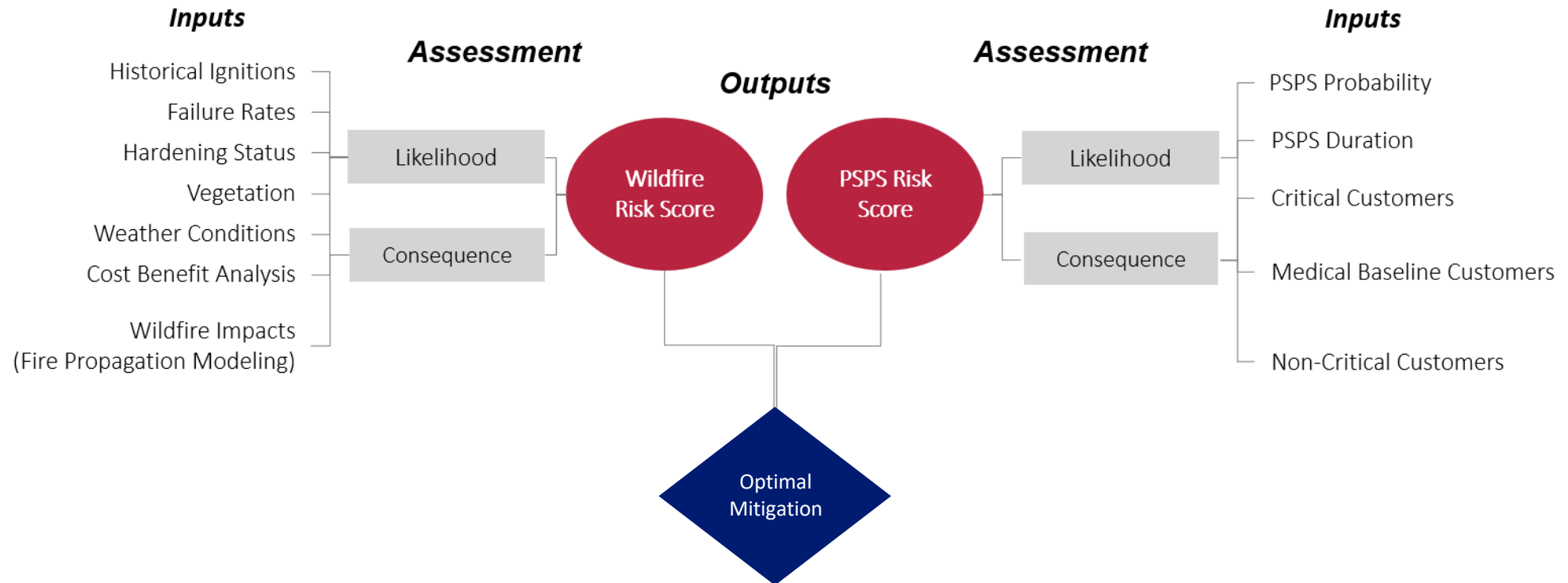| Program	Generator Grant Program	Generator Assistance Program	Fixed Backup Power
Summary	Portable backup battery provided to qualifying MBL or AFN customers in the HFTD at no charge	Portable fuel generator & backup battery (portable power station) rebates for qualifying HFTD customers, additional rebate for CARE customers	Provides a permanent generator to customers that have a high risk of experiencing a PSPS
2021 Accomplishments	• Delivered 2,310 batteries (116% of 2,000 target); 3,795 total since 2019 • 47 backup batteries delivered to AFN customers • Streamlined process for Indian Health Council • 98% of customers are very satisfied, 94% are very prepared	• Issued 1,850 rebates (target = 1,250). 2,040 total since 2020 • 735 redeemed by customers • 88% of customers are somewhat to very satisfied with rebate process	• >465 generator install agreements signed; >350 operational by year's end • Began installation of Mobile Home Park resilience solution (solar + battery)
2022 Planning	• Target: 3,000 batteries • Continuing to evaluate competitive bids for program support • Develop online customer request form	• Target: 1,250 rebates • Update rebate process to allow purchase at additional retailers • Include more models with safety features to qualified product list	• Target: 470 generators • Integrate & test non-fossil fuel solutions • Expand to 2 mobile home parks, 2 schools, critical facilities & Community Resource Centers

Risk Modeling & Assessment

Nisha Menon

Team Lead, Wildfire Regulatory Analytics Team Lead

Risk Assessment – WiNGS Planning Model

SDGE

Wildfire Next Generation System (WiNGS)

Inputs
- Historical Ignitions
- Failure Rates
- Hardening Status
- Vegetation
- Weather Conditions
- Cost Benefit Analysis
- Wildfire Impacts (Fire Propagation Modeling)

Assessment
- Likelihood
- Consequence

Outputs
- Wildfire Risk Score
- PSPS Risk Score

Assessment
- Likelihood
- Consequence

Inputs
- PSPS Probability
- PSPS Duration
- Critical Customers
- Medical Baseline Customers
- Non-Critical Customers

Optimal Mitigation

2021 Accomplishments

- **Initiated automation** of WiNGS Planning
- Investigated and refined risk calculation methodologies & model assumptions
- Developed **proof of concept tool** for visualization

2022 Planning

- **Increase automation** of risk modeling
- Update & incorporate **broader range of input** in risk assessments & PSPS decision-making tools

Risk Assessment – WiNGS Ops Model
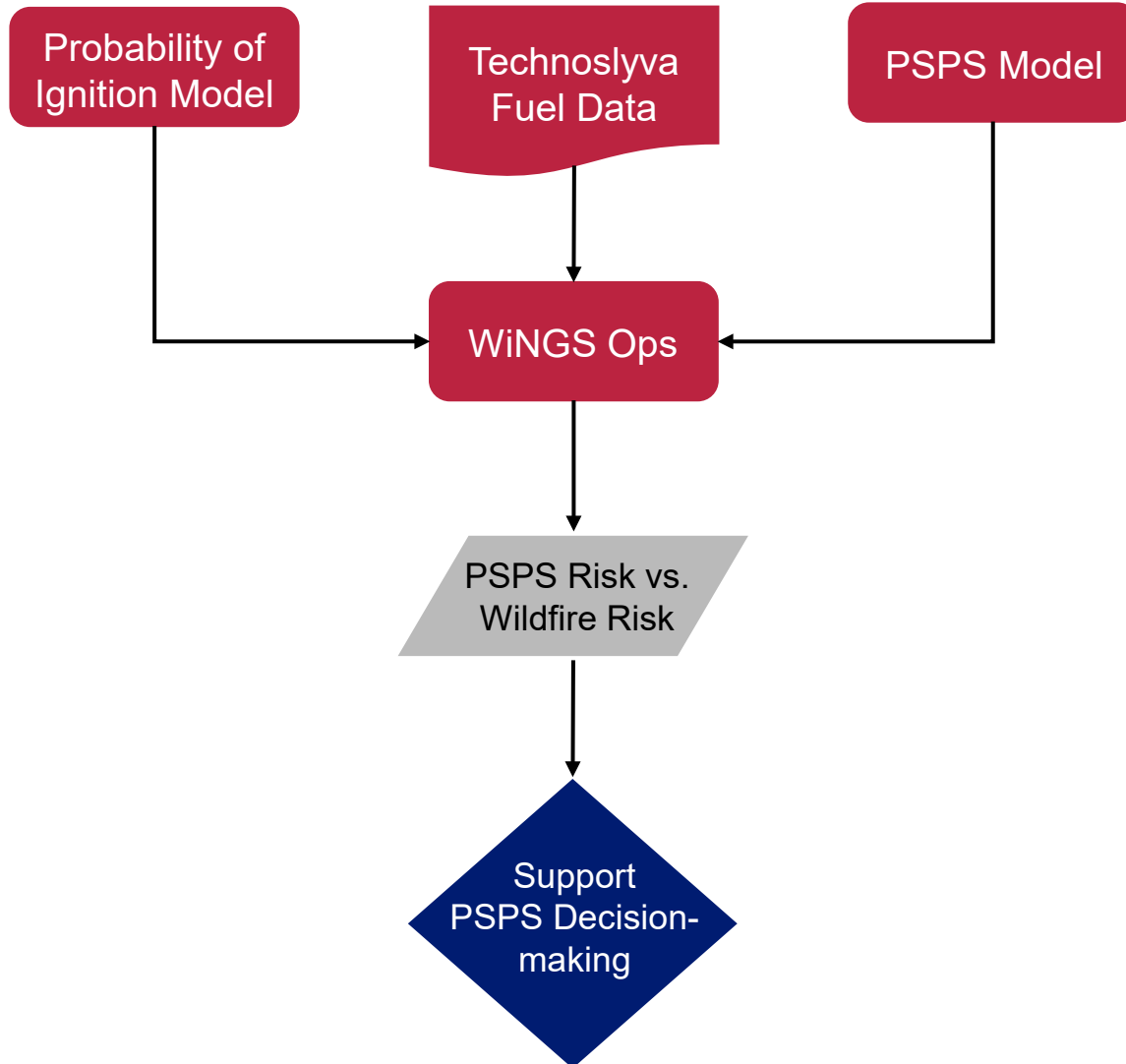
2021 Accomplishments

- Updated data & algorithms to improve consequence modeling
- Developed a probabilistic conductor risk model
- Developed preliminary ignition prediction models
- Initiated the Cloud migration of risk models

2022 Planning

- Update & incorporate broader range of input in risk assessments & PSPS decision-making tools
- Increase automation of risk modeling
- Improve & iterate models for predicting ignitions
- Migrate & execute risk models in the Cloud

Top Risk Spend Efficiencies by Category

SDGE™

Grid Hardening

- **3273** PSPS Sectionalizing Devices
- **529** Expulsion Fuses
- **211** Lightning Arrestors
- **200** Hotline Clamps
- **197** SCADA Capacitors
- **172** Strategic Undergrounding
- **31** Traditional Hardening
- **29** Covered Conductor

Operations

- **30M** Automatic Recloser Operations
- **230k** Sensitive / Fast Protection Settings
- **254** Personnel Work Procedures
- **160** Infrastructure Protection Teams
- **115** Aviation Firefighting

Asset Replacement

- **429** Distribution Patrols
- **345** Transmission Infrared Inspections
- **165** Transmission Drone Inspections
- **159** Wood Pole Inspections
- **156** Detailed Distribution Inspections

Resiliency

- **853** Generator Assistance Program
- **375** Generator Grant Program
- **204** Microgrids
- **160** PSPS & Mitigation
- **83** Standby Power Programs

Risk Reduction

Risk Spend Efficiency

4
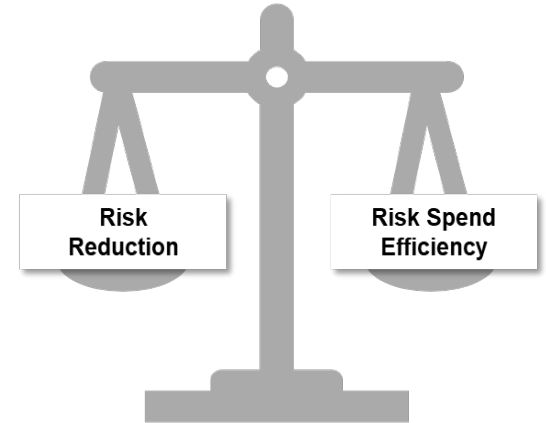
Vegetation Management

Michael Daleo
Manager, Wildfire Mitigation & Vegetation Management

Vegetation Management

Continue to effectively & proactively mitigate fire risk through multiple annual Vegetation Management activities

2021 Program Accomplishments

- >12K targeted trees trimmed or removed to enhanced clearances

- Zero tree-related ignitions on distribution circuits

- Strengthened HFTD inspections with four new internal patroller positions

- Successful implementation of new advanced work management system

- ~11K trees distributed to promote sustainability & environmental enhancement

- 46% of all green waste diverted from landfill to recycling centers

2022 Planning

- Further integrate LiDAR & satellite imagery technology

- Perform additional off-cycle HFTD inspections before peak fire season

- Engage customers through interactive online survey

- Expand situational awareness through integration of VRI & inspection activities

- Plant or distribute 10K trees, supporting company sustainability initiative

Preparing for 2022 Wildfire Season

Mitigating wildfire risk through tree pruning & removal

- **~ 480,000 inventory trees** inspected annually

- **~ 245,000 trees** in HFTD annually receive a second Level 2 inspection

- **~ 12,500 targeted tree species** for enhanced trimming

- **64,000 inventory palms** across service territory; **~ 5,000** removed annually

- **100% of identified overstrike** (overhanging branches) in the HFTD abated
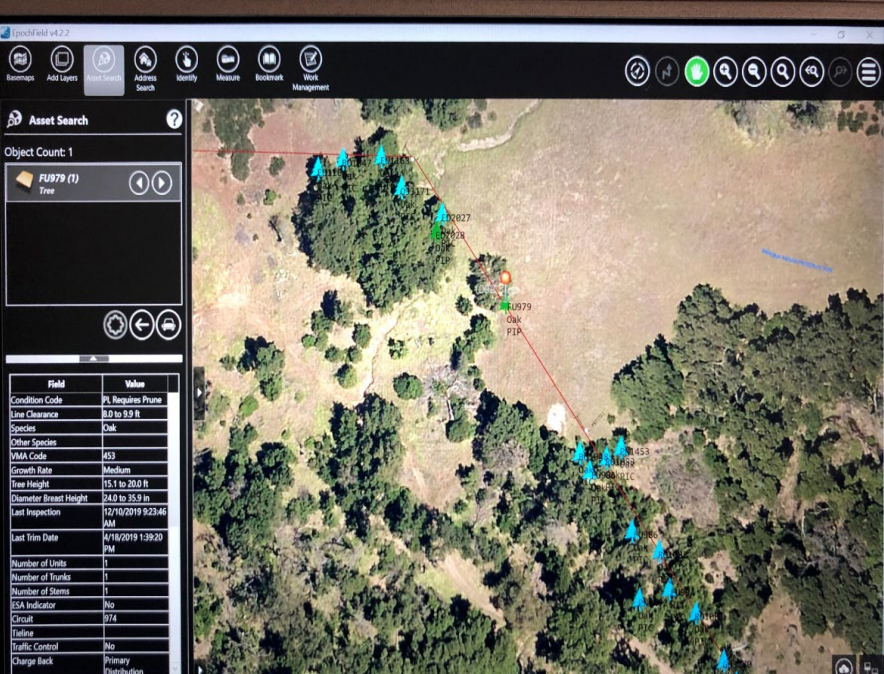
Vegetation Management Inventory – Tree Database

- Contractor activities recorded electronically, including asset location & tree attributes

- GIS-based - all structures numbered in field & in database

- Info uploaded nightly & visible to all users next day

2021 Accomplishments

- Rollout of "EPOCH" electronic work management system

- Updated information for improved customer notification and engagement

- Accurate GPS positioning of each inventory tree

2022 Planning – Begin integration of genus/species

2021 Fuels Modification

Reducing flammable fuels by mechanically thinning native vegetation & removing non-native/dead vegetation in Tier 2 & 3 of the HFTD

- Target poles that already require brushing for fire prevention (PRC 4292)
- Additional thinning of vegetation (50-ft radius around pole)
- Prioritized using circuit risk modeling
- Low environmental & cultural impacts

Accomplishments

- **2798** customers engaged
- **203** poles completed
- **27.15** acres thinned
- **$1.51M** implementation cost

Sustainability Strategy

Vegetation Management, Community Relations & Environmental Services partnering to support & promote sustainability

- 10K trees annual commitment. **11,673 trees** planted in 2021

- Customers, schools, cities, parks, Homeowner Associations, tribal, land agencies, etc

Key Considerations:

Intelligent water use

Desirable planting location

Right tree, right place

Urban heat island mitigation

Promote biodiversity

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

SDGE

- **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
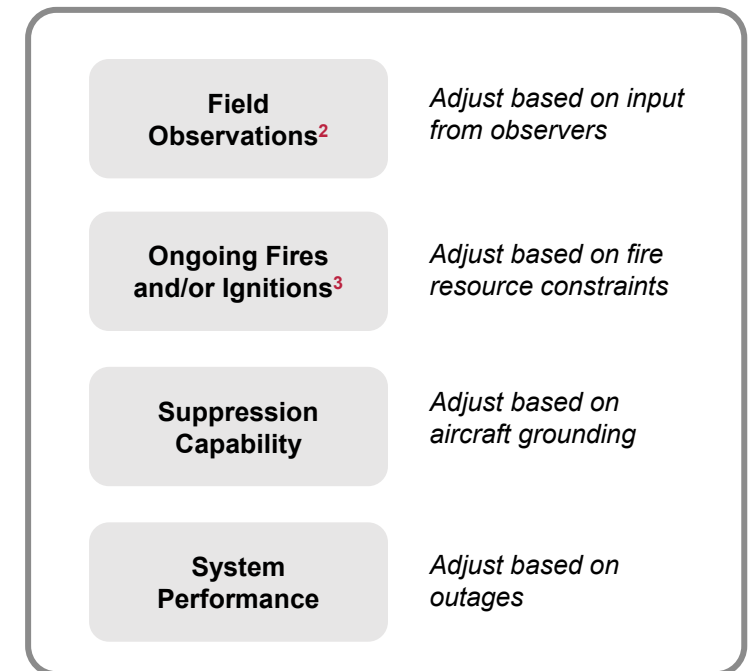
PSPS Decision-Making Framework

SDG&E

Monitor Fire Condition Forecasts

- Fire Potential Index (FPI)
- Santa Ana Wildfire Threat Index (SAWTI)
- Red Flag Warnings
- Wildfire vs PSPS Risk Forecast (New)

Establish Circuit List & Alert Wind Speeds based on Historical Wind Patterns[1]

Baseline Alert Wind Speeds	Start with 99th Percentile
High VRI / High CRI	Adjust for VRI & CRI at the segment level
Temporary Configuration	Adjust for existence of temporary configurations
Hardening	Adjust for prior hardening
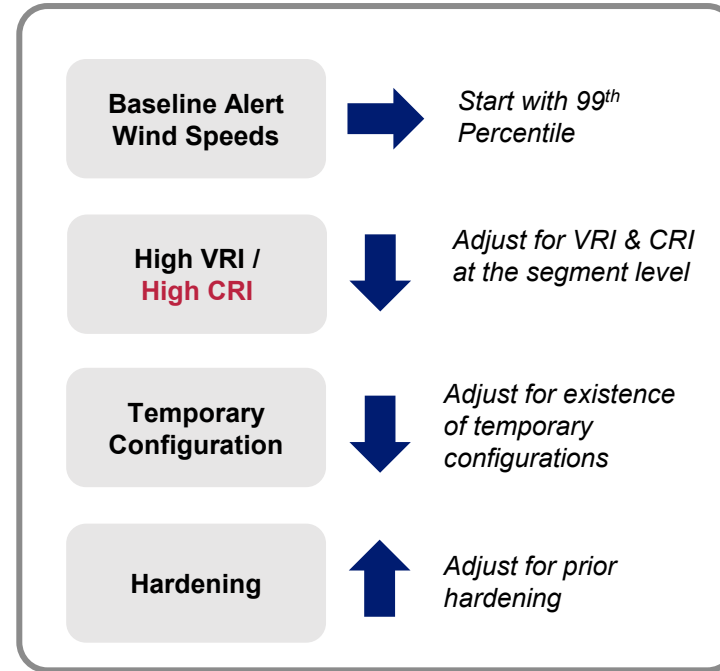
Use Field Information & Real Time Updates to Inform De-energization

Field Observations[2]	Adjust based on input from observers
Ongoing Fires and/or Ignitions[3]	Adjust based on fire resource constraints
Suppression Capability	Adjust based on aircraft grounding
System Performance	Adjust based on outages

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**

Reduced PSPS Customer Impacts

Compared to similarly rated PSPS' in 2020

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

How strong?   *How widespread?*   *Weather/fuels?*

2020-21

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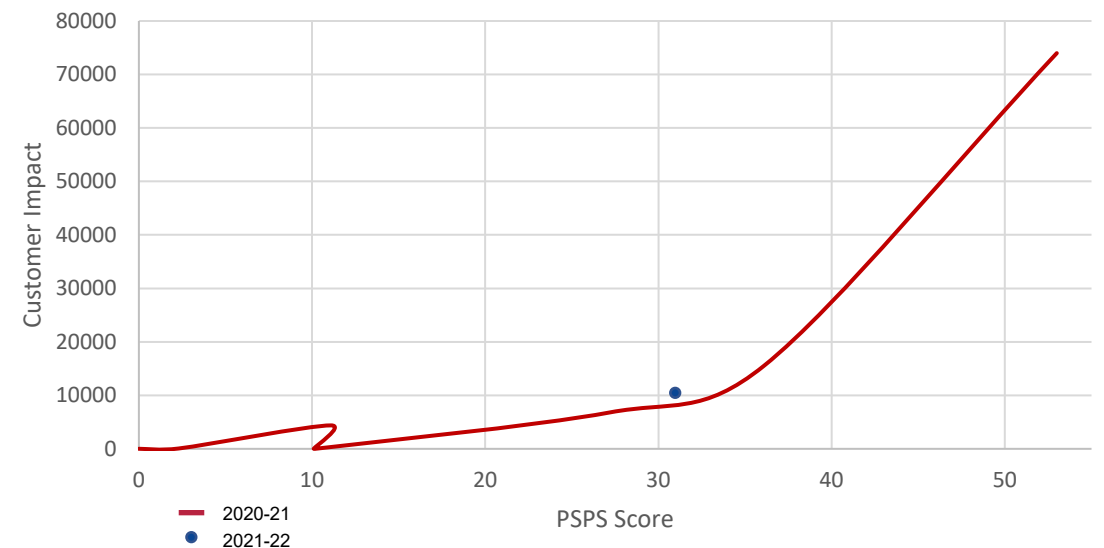
Academic Partnerships

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
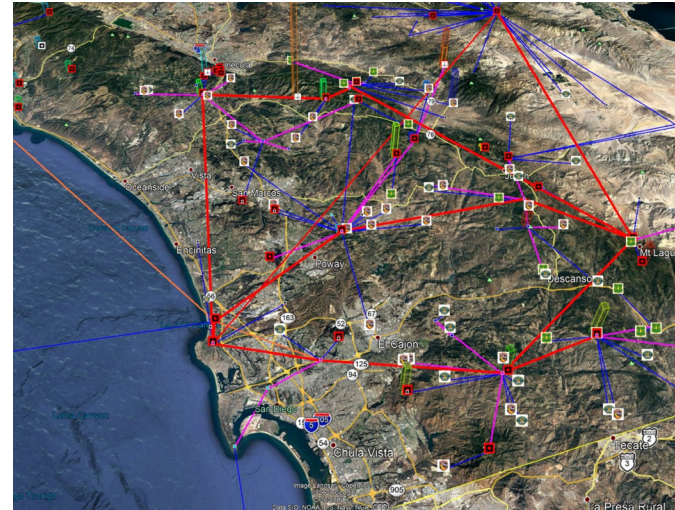
Scripps Institution of Oceanography

- 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**
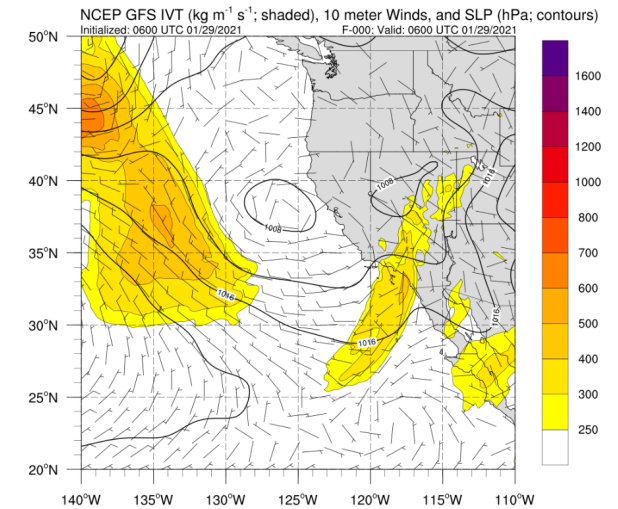
Academic Partnerships
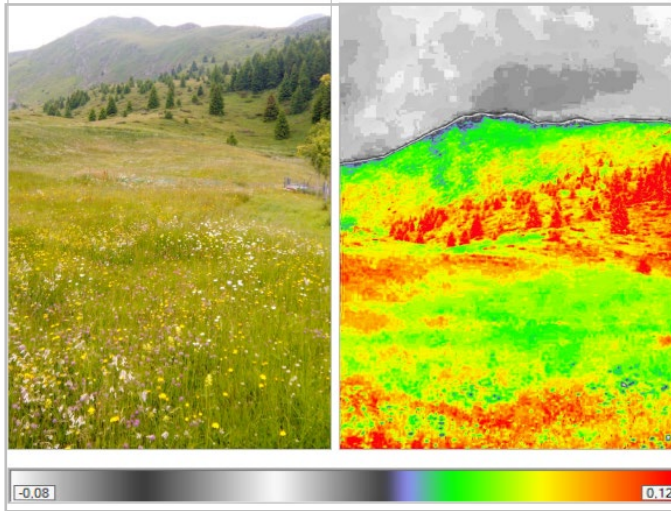
San Jose State University

- **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**

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
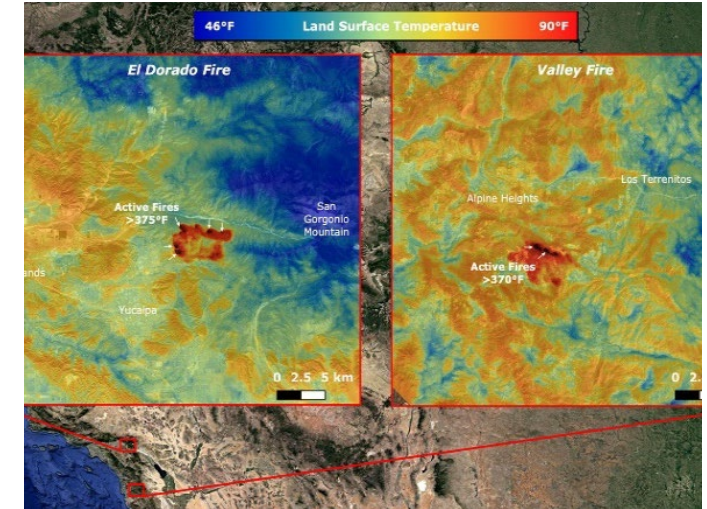
UW Space Science & Engineering Center

- 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
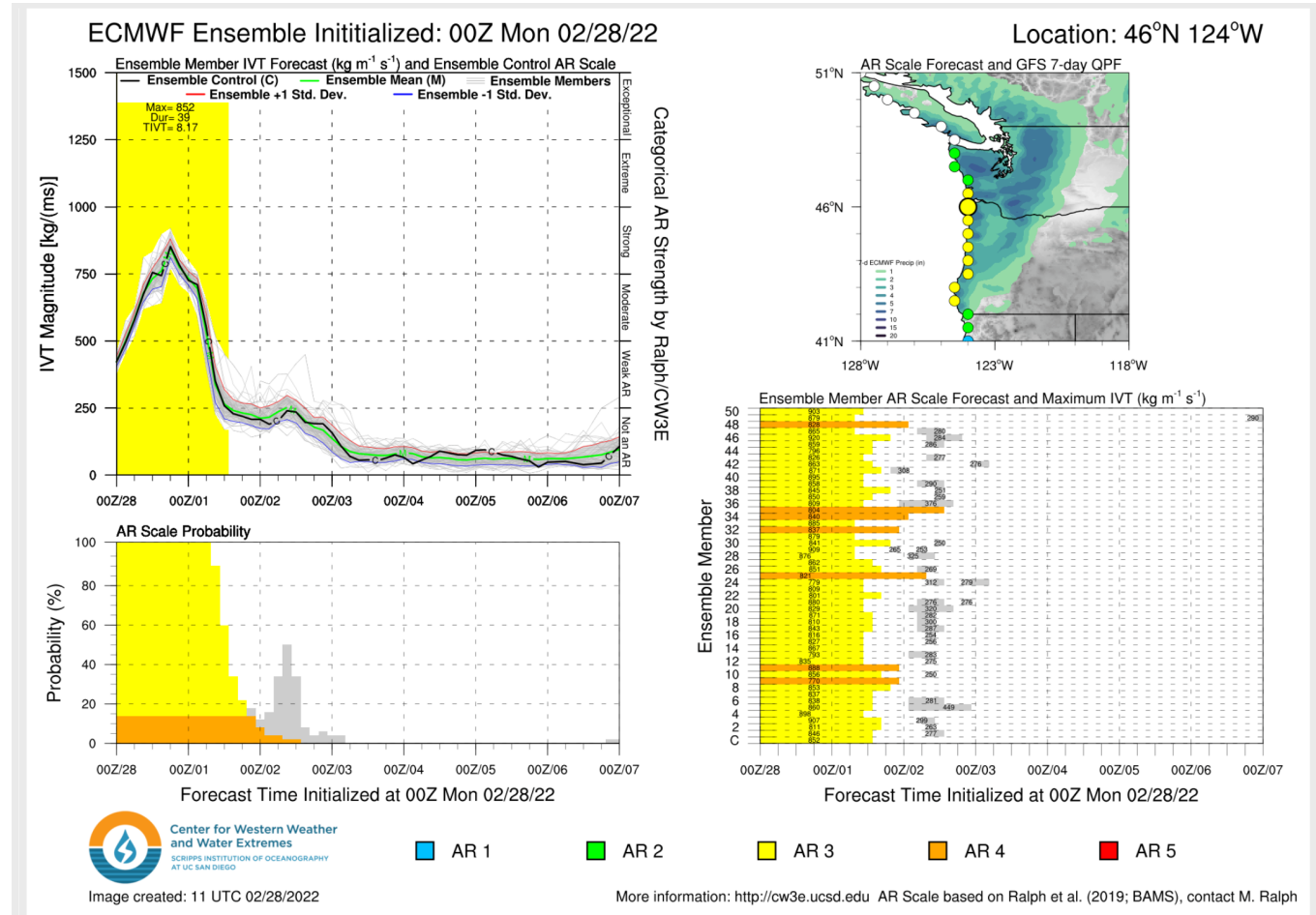
2021 AFN PSPS Support

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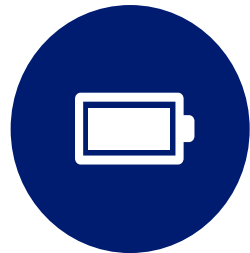Data-driven, leveraging digital factory bots & automation to identify & target customers

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

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

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

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

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

Legend
- SDG&E District Boundary
- DAC Customer
- AFN Customers
- HFTD Tier2
- HFTD Tier3
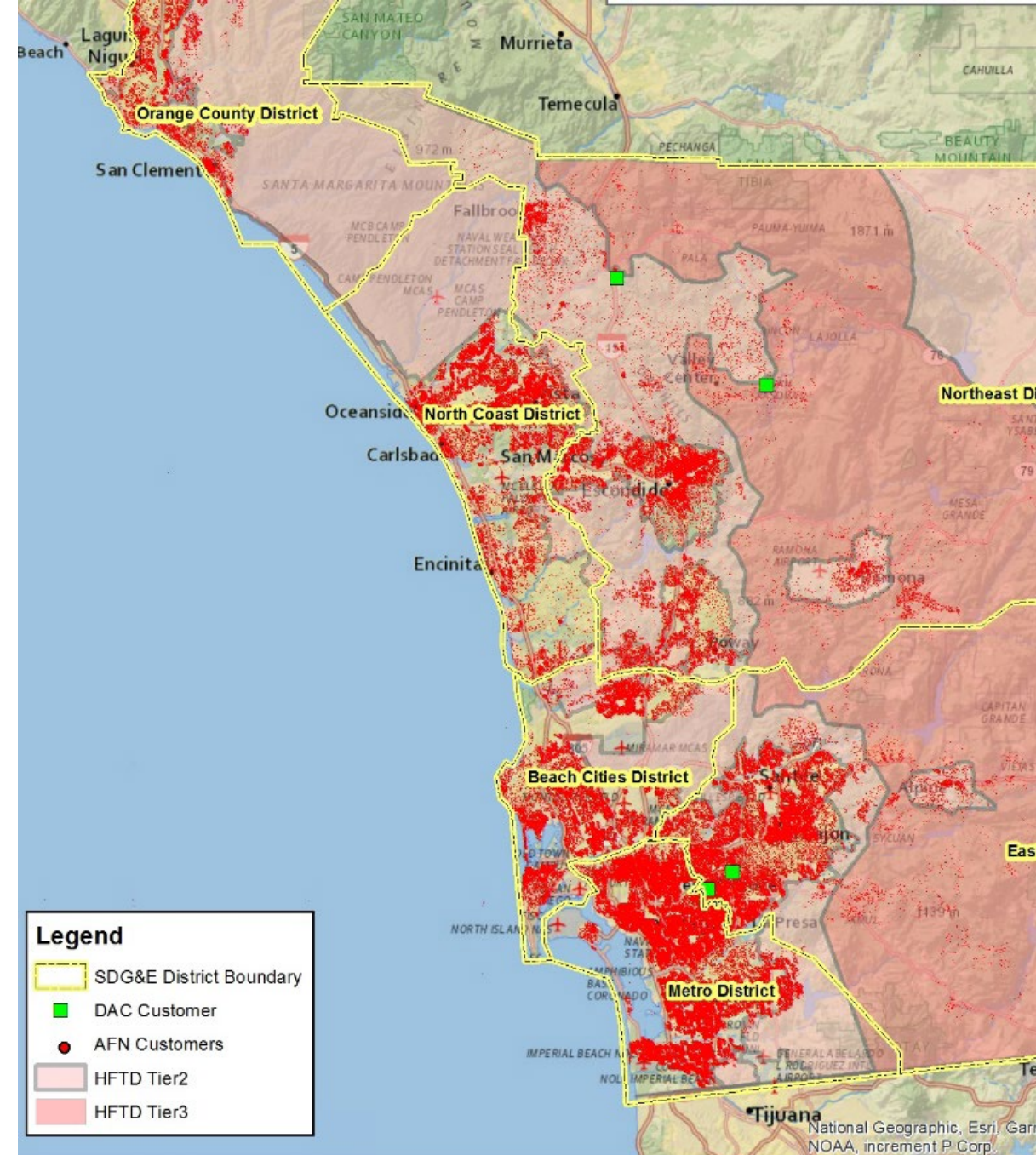
Wildfire Preparedness Outreach & Education

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
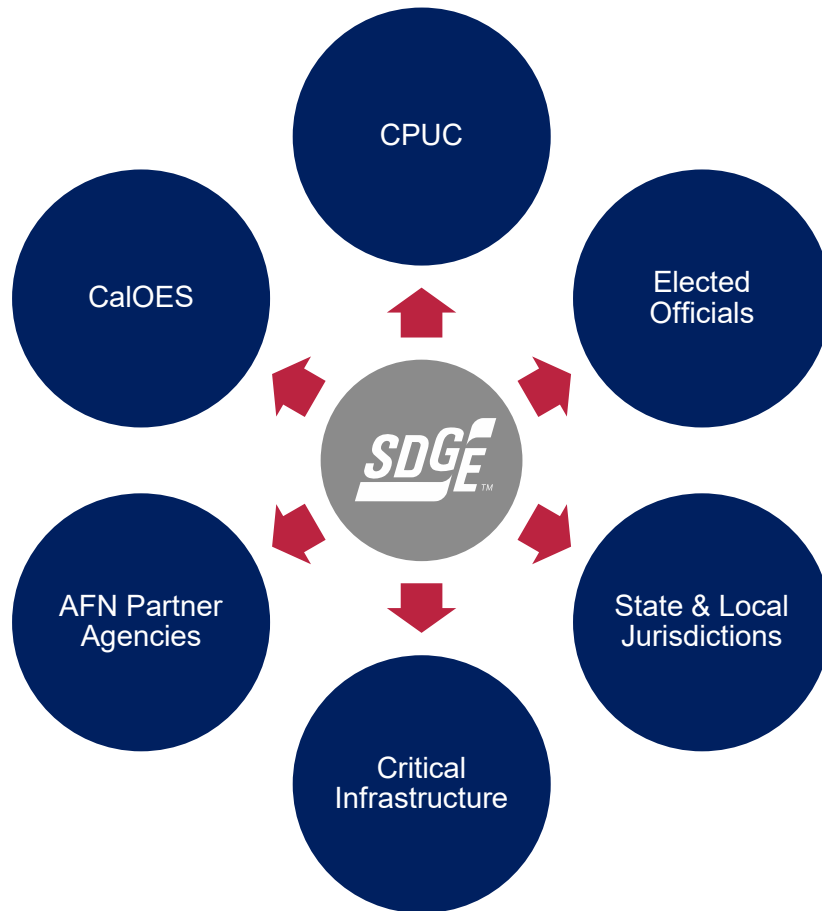
Emergency Operations Center (EOC) Activations

- 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

~ 48 hours before power is turned off

~24 hours before power is turned off

~ 12 hours before power is turned off

~ 1-4 hours before power is turned off

When the Public Safety Power Shutoff starts

If any Community Resource Centers are opened

When field inspections begin

When electric power is restored

PSPS Portal – Partner View

Search capabilities

Can show only one status at a time

Expandable rows

PSPS Portal – Partner View

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

17

Asset Management & Data Governance

Jennifer Kaminsky
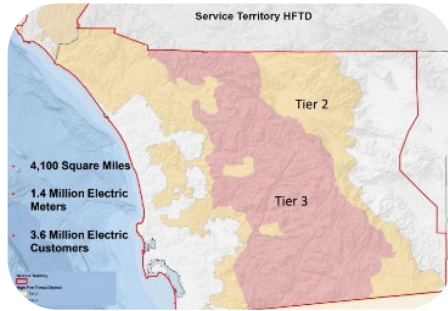
Manager, Electric Assets & Compliance

Rob Malowney

Manager, Asset Data Systems & Records

Asset Management Inspection Programs
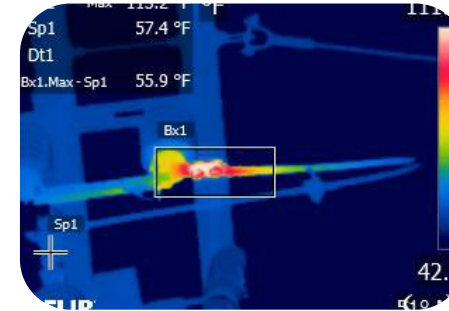

Enhanced Inspections

Special HFTD Tier 3 inspections

Drone assessments

Infrared inspections

LiDAR inspections

Traditional Inspections

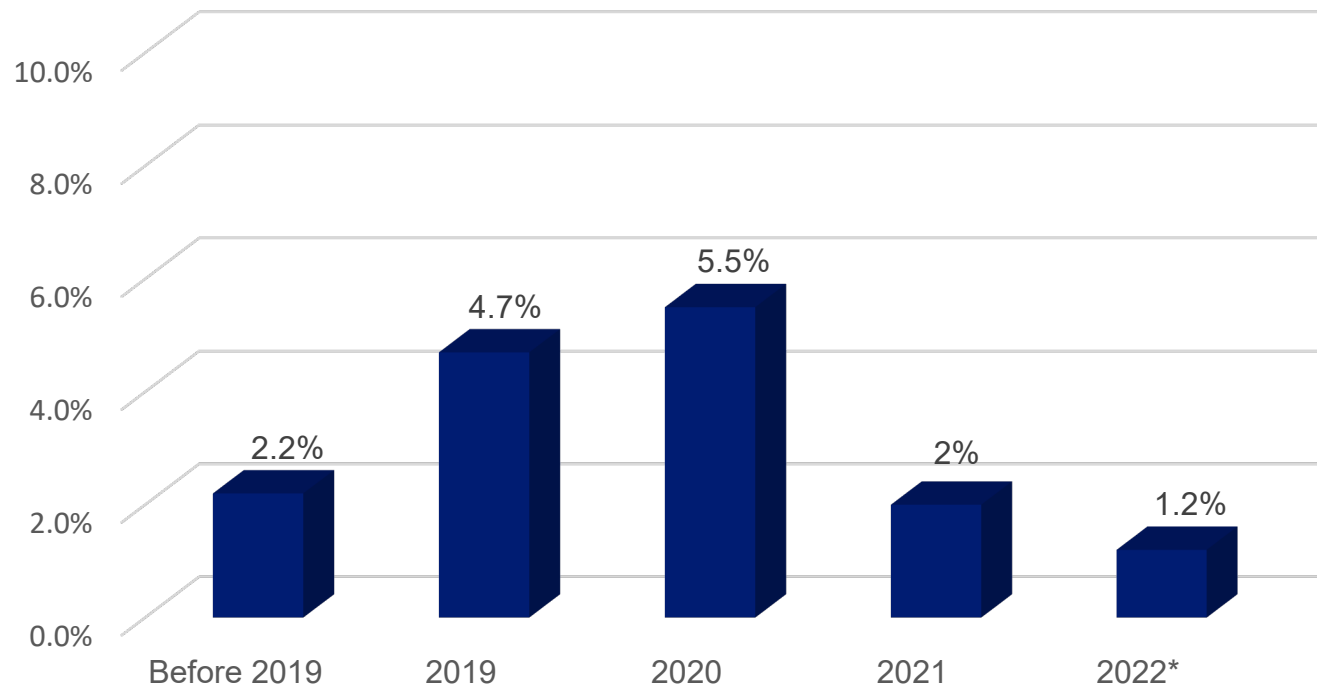*Detailed overhead visual inspections*

Patrols

Intrusive pole inspections
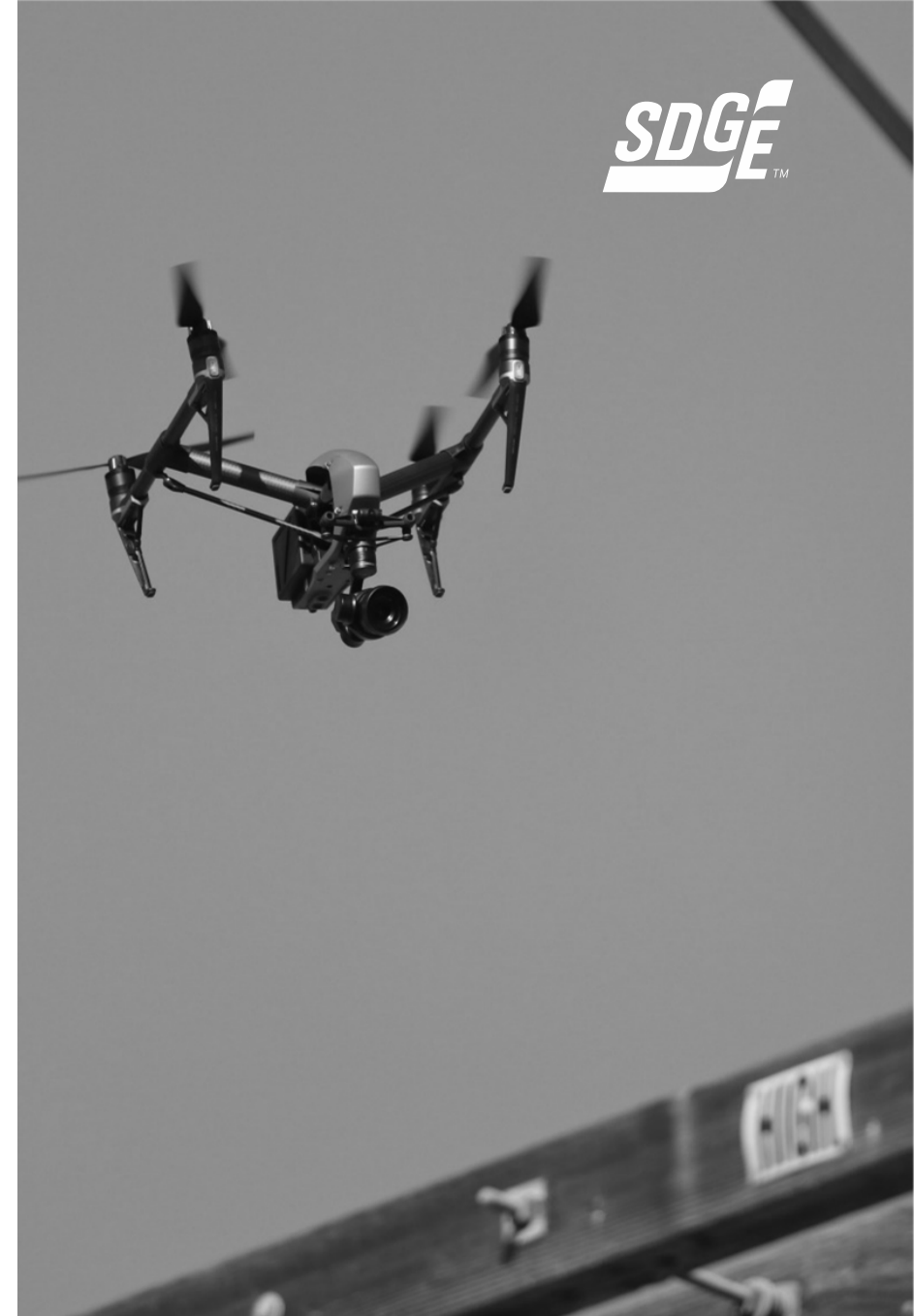
Drone Assessments

- Tier 3 HFTD drone assessments began in 2019
- **> 95%** of repairs identified during Tier 3 drone assessments in 2021
- **> 400%** decrease in issues from 2020 to 2022

% Tier 3 Distribution Poles w/ Issues

	Before 2019	2019	2020	2021	2022*
%	2.2%	4.7%	5.5%	2%	1.2%

* YTD ~ 75% Tier 3 QC inspections complete

IIP – Creating Opportunities for Artificial Intelligence Integration

Intelligent Image Processing (IIP) uses machine learning to automatically identify assets & damages in imagery captured from the field
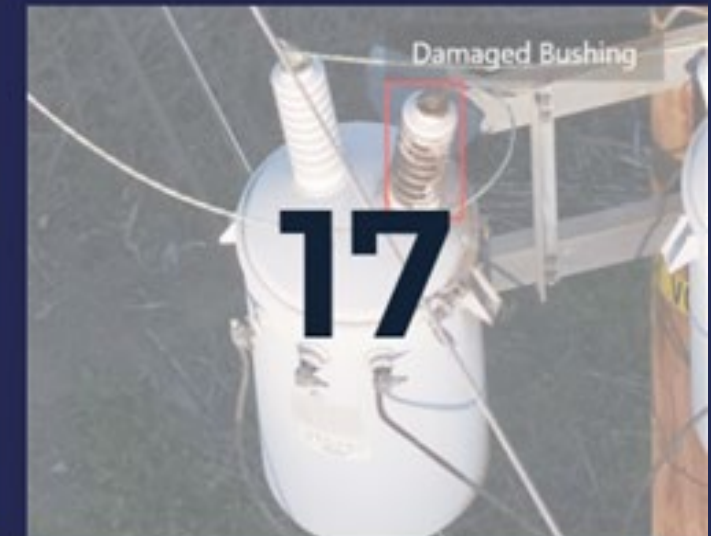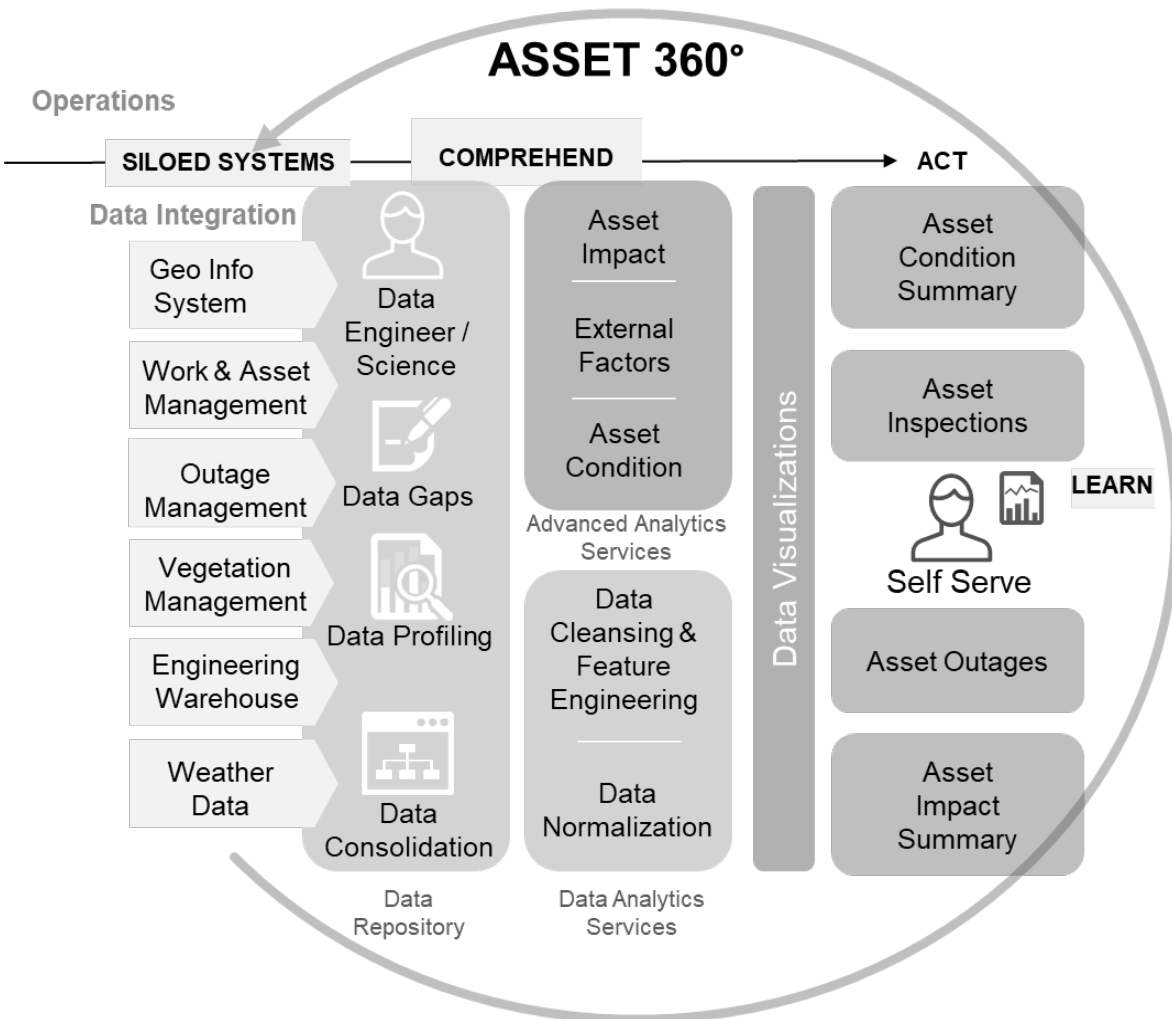

Images & Poles Automatically Assessed

25,087 Poles
547,973 Images

Accuracy of IIP Models

89%

Crossarm - Tracking

Crossarm - Tracking

Damage Detection Models Running Daily

17

Damaged Bushing

As of 2/28/2022

Asset 360 Data Program

2021 Accomplishments

- Built consolidated data models and dashboards for:
  - *distribution poles, wires, cables, tees, capacitors and switches (including asset condition predictions)*
  - *transmission structures, conductor and hardware*
- Created baseline measurements for data quality & accessibility for select distribution assets

2022 Planning

- Build consolidated asset data models, asset condition predictions & dashboards for:
  - *distribution secondary, OH connectors, transformers and fuses*
  - *transmission underground connectors and select substation assets*
- Improve data quality through source system remediations for both distribution & transmission
- Integrate with IIP to improve data quality & model accuracy

Data Governance Focus & Priorities

By OEIS Guideline Areas

Centralized repository for asset data

- Integrated >20 data sources, automating >350 / 560 metrics
- Consolidated non-spatial & spatial data
- Implemented internal program dashboards
- Enabled data quality visibility by developing scorecards

Collaborative research on utility ignition and/or wildfire

- Increased situational awareness through partnerships with academia & government agencies
- Data sharing & development of statewide modeling tools
- Academic partnerships include Cal Poly Wildland Urban Interface (WUI) FIRE Institute & San Jose State University's Fire Science Lab
- DOE Partnership for Energy Sector Climate Resilience Initiative

Documentation & disclosure of wildfire-related data & algorithms

- Documented >20 data sources within the central repository
- Defined >260 terms in data governance glossary
- Of 350 automated metrics, documented >50 metric automation processes & 10 data governance framework areas
- Completed seven audits of the 10 data governance framework areas

Tracking & analysis of risk event data

- Trending analysis on 20 monitored metrics
- Solidified processes for gathering ignition & near ignition data & refined information workflows
- Leveraged ignition & outage data in Probability of Ignition (POI) models to create foundational knowledge informing WMP initiatives
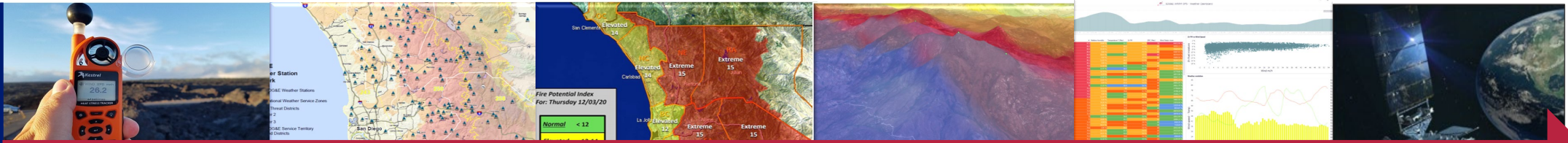
Thank you

APPENDIX

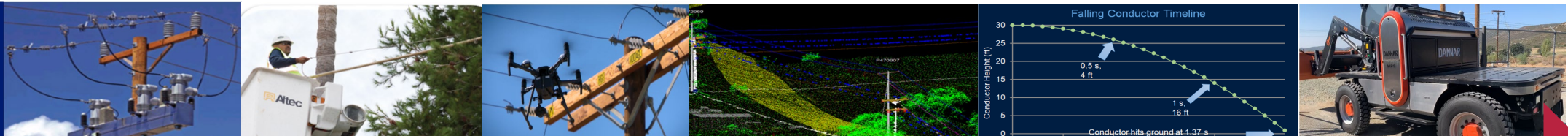# More Than a Decade of Wildfire Mitigation Evolution

More than 14 years of persistent effort & investments resulting in significant wildfire safety improvements at the lowest cost possible for our customers

Situational Awareness

221 Weather Stations • **110+** Cameras Monitored • AI-Based Forecasting • Reduced PSPS Impacts

Engineering & Operations

92% HFTD Transmission Hardened • **900+** mi HFTD Distribution Hardened • Transmission Faults Reduced **84%** • Distribution Faults Reduced **45%**

Outreach & Education

Enhanced Community Resiliency • Annual Wildfire Safety Fairs • **3600+** Generators Distributed • **11** Community Resource Centers