



& WILDFIRE SAFETY

2021 PSPS Performance & Lessons Learned

February 25, 2022



Introduction

Kevin Geraghty - Senior Vice President of Electric Operations



Forecasting

Brian D'Agostino, Director of Fire Science & Climate Adaptation

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)
- **3** 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**

The graphic is a red flag warning from the National Weather Service for San Diego, CA. It features a large red flame background. At the top left is the NWS logo and 'San Diego CA'. In the center, 'RED FLAG WARNING' is written in large, bold letters. Below this, it states 'Winds 20 to 30 mph' and 'Gusts 40 to 60 mph'. To the right, it says '5-10% relative humidity'. A yellow warning triangle with an exclamation mark is on the right. Below the main text, there are five icons with instructions: 1. A house icon with an arrow pointing to it: 'Bring flammable objects indoors (furniture, door mats, trash cans...)'. 2. A first aid kit icon: 'Have emergency kit ready to go. Consider packing it into car.' 3. A gas pump icon: 'Keep gas tank at least 1/2 full. Back your car into the driveway.' 4. A crossed-out wrench and screwdriver icon: 'Avoid use of equipment that may generate sparks.' 5. A smartphone icon: 'Keep phone charged, and stay up to date with official sources on social media'. At the bottom, it says '10 AM Wednesday - 6 PM Friday'. The bottom of the graphic has a red bar with the words 'PLAN', 'PREPARE', and 'ACT' separated by red arrows.

Normalizing Public Safety Power Shutoffs



Reduced customer impacts compared to similarly rated PSPS' in 2020

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

↓
How strong?

↓
How widespread?

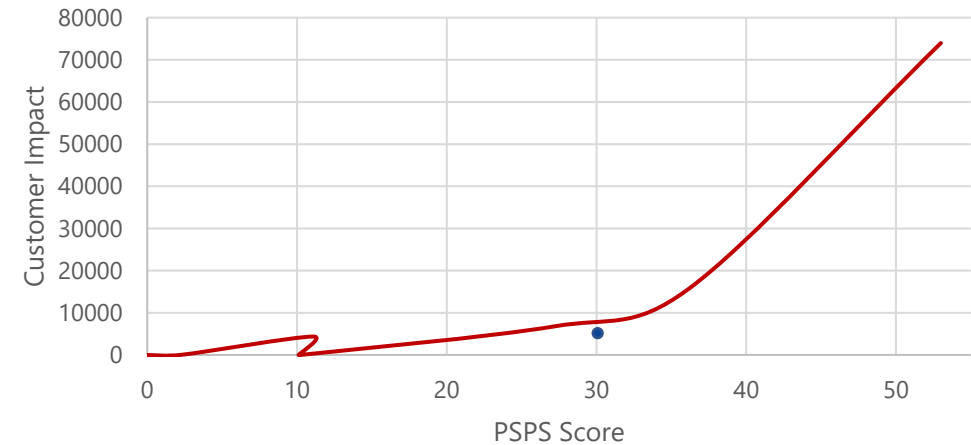
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Weather/fuels?

2020-21

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



— 2020-21
● 2021-22

Meteorology & Wildfire Resilience

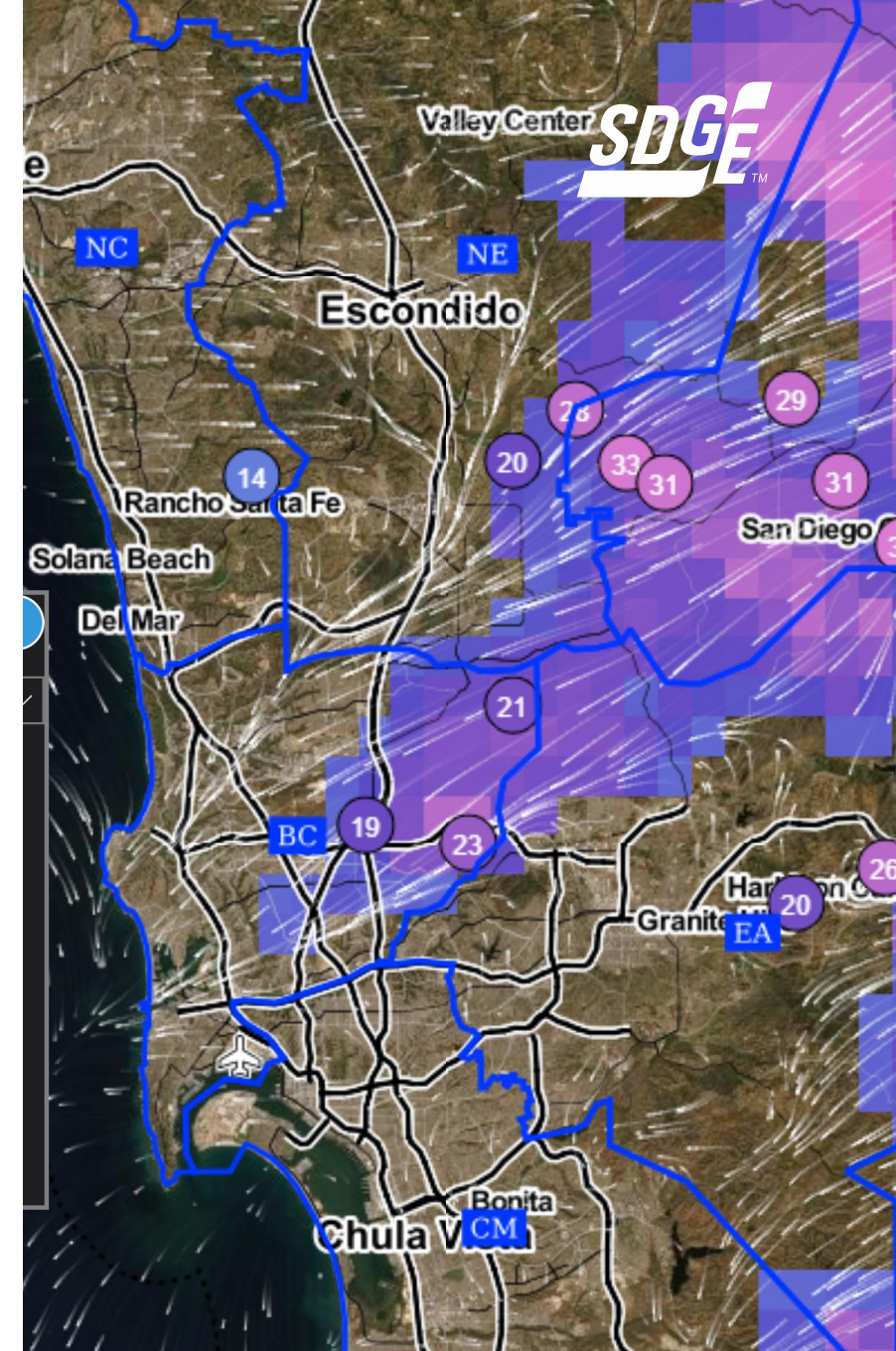
SDG&E continues to advance situational awareness to improve our ability to anticipate, prepare for & respond to wildfires across our region

2021 Accomplishments:

- First in CA to include **cameras that measure chlorophyll & moisture** in vegetation
- Mountaintop cameras equipped with **AI-based wildfire detection** capabilities
- **AI-based forecasting models** for more than 190 weather stations
- **Heat detections by satellites** linked to surface cameras to quickly identify wildfires
- Data sharing portal co-developed with the San Diego Supercomputing Center, making real-time SDG&E weather **modeling data publicly available**

2022 Planning:

- Strategically add **air quality sensors** throughout service territory to support employee safety
- Replace supercomputing platform enabling **next generation weather processing & analytics**
- Expand & enhance AI-based forecasting system, mountain top AI smoke detection & satellite-based heat detection





Notifications / Communications

Zoraya Griffin, Senior Communications Manager



2021 PSPS Notifications



Post-Incident research suggests SDG&E is improving the overall customer experience during a PSPS through timely notifications and information-sharing

2021 Accomplishments

- Nearly **70%** of respondents are satisfied with notification process
- >33% of notified customers indicated **SDG&E has improved** compared to previous PSPS
- **Increased accessibility** of all notifications, including American Sign Language (ASL) video
- >15,100 PSPS app downloads in 2021; **38,057** total to date
- In-Community marquees and electronic roadside message signs deployed in affected communities
- Launched **Public Safety Partner Portal**. 87% surveyed public safety partners satisfied with SDG&E communications
- **200+** Community Based Orgs (CBOs) and Partners amplified messaging

2022 Planning

- 24/7 on-demand ASL support, fully accessible websites & notifications
- Refine and expand notification process and technology
- Continued coordination with regional public safety partners & CBOs to amplify messages

Public Education & Outreach

Collaboration with stakeholders to enhance community preparedness & regional wildfire resilience

2021 Accomplishments:

- 5 Wildfire Safety Webinars (300 total attendees)
- 6 drive-thru Wildfire Safety Fairs; **96% favorability rate**
- First **joint SDG&E/tribal** partner Wildfire Safety Fair
- More than **307,640,000** marketing impressions
- **88%** public education customer favorability
- **84%** overall favorability rating by surveyed Spanish-speakers
- Customized access & functional needs (AFN) public education campaign

2022 Planning:

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





AFN, MBL & Tribal Updates

Danielle Kyd, AFN Customer Strategy Manager



Support for Individuals with AFN



Continuously improving communications, partnerships, programs & tools for individuals with access and functional needs (AFN)

Medical Baseline Program

- Simplified program enrollment
- Confirmed customer contact information & promoted **AFN self-identification**
- Statewide joint utility multilingual MBL flyer. Partnered with In-Home Supportive Services & Regional Centers for targeted sign-ups
- ~**56,000** customers enrolled in the MBL Allowance program
- Continued enhanced PSPS notifications (**door-knocks**)

Access & Functional Needs

- Partnered with 211 to connect customers to **24/7 direct support** in 200+ languages
- Enhanced partnerships with CBOs, including Indian Health Councils
- Dedicated **AFN liaison**, accessible webpage & email address
- Proactive **targeted program outreach** to offer resources, like generators
- Enhanced support at Community Resource Centers, including **on-site ASL interpretation**

AFN Support during Thanksgiving PSPS

Continued mitigation of PSPS customer impacts through improved outreach, programs and services

- **Close collaboration** across key organizations
- Provided frequent updates to over **725 AFN partners** for support, coordination & message amplification
- **Services provided:**
 - No cost hotel stays & accessible transportation
 - Back-up batteries to tribal members in advance & generators delivered on-demand
 - Warm meals at CRCs & support to tribal partners
 - Additional food support from San Diego Food Bank & food gift cards
 - 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. 🙏🙏








Backup Battery Programs

Jon Kochik, Customer Integrated Solutions Manager

Backup Generator & Battery Programs



Program	Generator Grant Program	Generator Assistance Program	Fixed Backup Power
Summary	<p>Portable backup battery provided to qualifying MBL or AFN customers in the HFTD at no charge</p> 	<p>Portable fuel generator & backup battery (portable power station) rebates for qualifying HFTD customers, additional rebate for CARE customers</p> 	<p>Provides a permanent generator to customers that have a high risk of experiencing a PSPS</p> 
2021 Accomplishments	<ul style="list-style-type: none"> Delivered 2,310 batteries (target= 2,000); 3,795 total since 2019 Streamlined process for Indian Health Council 98% of customers are very satisfied, 94% are very prepared 	<ul style="list-style-type: none"> Provided 735 rebates (target = 1,250) 2,040 total since 2020 88% of customers are somewhat to very satisfied with rebate process 	<ul style="list-style-type: none"> >465 generator install agreements signed; >350 operational by year's end Began installation of Mobile Home Park resilience solution (solar + battery)
2022 Planning	<ul style="list-style-type: none"> Target: 3,000 batteries Continuing to evaluate competitive bids for program support Develop online customer request form 	<ul style="list-style-type: none"> Target: 1,250 rebates Update rebate process to allow purchase at additional retailers Include more models with safety features to qualified product list 	<ul style="list-style-type: none"> Target: 470 generators Integrate & test non-fossil fuel solutions Expand to 2 mobile home parks, 2 schools, critical facilities & Community Resource Centers



2021 Lessons Learned

Mona Freels, Emergency Operations Services Manager



2021 PSPS Lessons Learned



Improvement Opportunity	Programmatic Responses
Increased number of new Emergency Operations Center responders	Diversify training methodologies & delivery modalities
Public Safety Partner notification system had a category flagging issue	Categories have all been recoded
Contract caterers insufficiently resourced to provide warm food to AFN support partners	Logistics & supplier diversity teams assisted vendors Warm food contracts & availability confirmed in advance to allow for alternatives
Customer notifications received as "spam" calls	Meet with telecoms to determine how to ensure emergency calls are not flagged as spam



Mitigation Efforts

Jonathan Woldemariam, Director of Wildfire Mitigation



Microgrids & Temporary Generators



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

2021 Accomplishments:

- Significant progress at key microgrid (Cameron Corners); adjacent undergrounding completed
- Microgrid **construction completed** to support CAL FIRE's Ramona Air Attack Base
- Introduced mobile battery to replace diesel temporary generators & provide mobile **Electric Vehicle charging** at Community Resource Centers













2022 Planning:

- Commissioning Ramona Air Attack Base & Cameron Corners microgrids
- Complete **land acquisition** for Butterfield Ranch & Shelter Valley microgrid locations; issue request for construction contract proposals
- Design & engineering of additional microgrid sites
- Continue to **explore additional applications** & uses for mobile battery energy storage units

WMP – Plans, Actuals & Totals

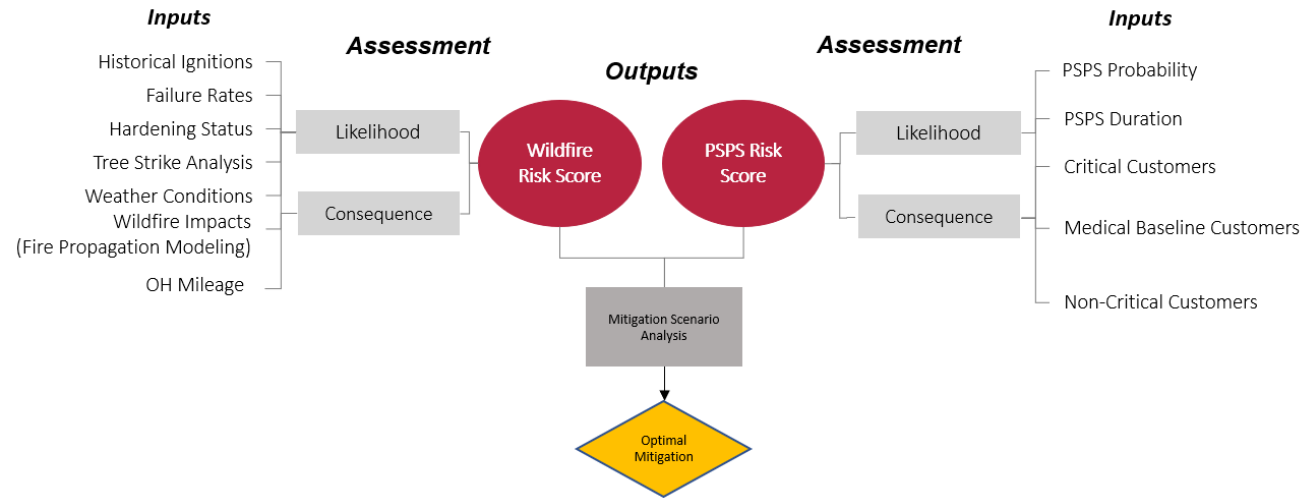


 <p>Undergrounding</p>	<p>65 Miles targeted in 2022</p> <p>25.9/25.0 Miles installed in 2021</p> <p>56 Miles Installed since 2020</p>	 <p>8 Camera installations targeted in 2022</p> <p>20 Weather station upgrades targeted in 2022</p>	<p>17/17 Cameras installed in 2021</p> <p>46/25 Weather station upgrades in 2021</p> <p>4 Cameras installed in 2020</p> <p>30 Weather station upgrades in 2020</p>
 <p>Covered Conductor Installation</p>	<p>60 Miles targeted in 2022</p> <p>20.6/20.0 Miles installed in 2021</p> <p>22.5 Miles installed since 2020</p>	 <p>Aerial Fire Suppression</p>	<p>793k Gallons dropped YTD (2021)</p> <p>1.59M Total gallons dropped since 2020</p>
 <p>Traditional Hardening</p>	<p>5 Miles targeted in 2022</p> <p>117/116 Miles installed in 2021</p> <p>321.5 Miles installed since 2020</p>	 <p>Enhanced Vegetation Management</p>	<p>12,500 Trees trimming / removal targeted in 2022</p> <p>12,578/17,000 Trees trimmed / removed since 2021</p> <p>29,653 Trees trimmed / removed since 2020</p>
 <p>Asset Install/Replacement</p>	<p>4,325 Assets to install/replace in 2022</p> <p>8,052/7,176 Assets installed/replaced in 2021</p> <p>13,322 Installed/replaced since 2020</p>	 <p>Distribution Inspections</p>	<p>151K Inspections targeted in 2022</p> <p>168k/169k Inspections since 2021</p> <p>350k Inspections completed since 2020</p>
 <p>Generators</p>	<p>3,670 Eligible customers targeted for generators in 2022</p> <p>3,404/3,013 Generators provided to eligible customers in 2021</p> <p>6,173 Generators provided since 2020</p>	 <p>Transmission Inspections</p>	<p>16,707 Inspections targeted in 2022</p> <p>17,711/ 19,638 Inspections completed in 2021</p> <p>43,247 Inspections completed since 2020</p>

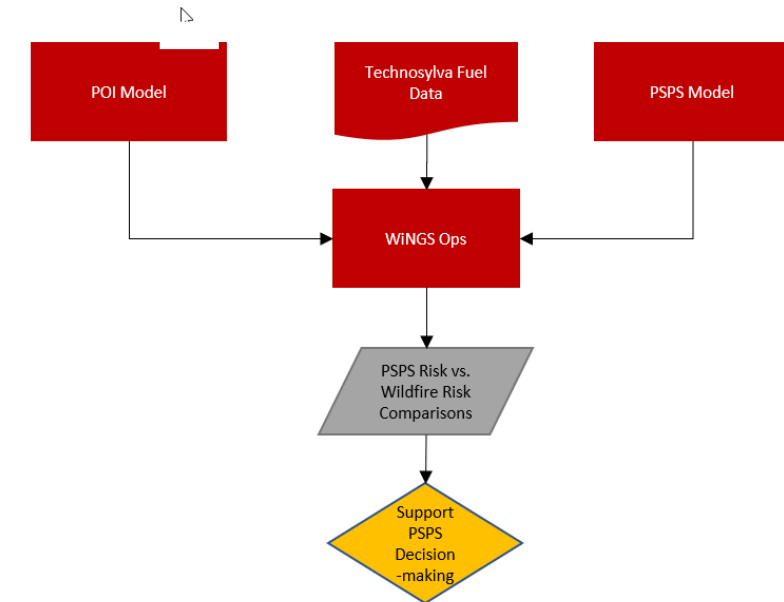
Risk Assessment Overview



Wildfire Next Generation System (WiNGS)



WiNGS Operations



2021 Accomplishments

- Updated data & algorithms to **improve consequence modeling**
- **Initiated automation** of WiNGS Planning
- Developed preliminary ignition prediction models
- Initiated the **Cloud migration** of risk models

2022 Plan




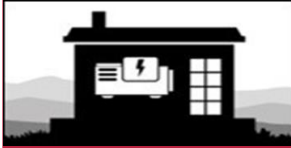
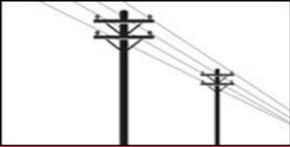

- Update & incorporate **broader range of input** in risk assessments & PSPS decision-making tools
- **Increase automation** of risk modeling
- Improve & iterate models for predicting ignitions
- Migrate & **execute risk models in the Cloud**

PSPS Mitigations – Projections & Results



Reduced Number of Customers Impacted

3-Year Proposed 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
 <p>PSPS Sectionalizing</p>	10 Locations 4,607 Customers	11 Locations 9,719 Customers	23 Locations 12,870 Customers	 <p>Standby Power Programs</p>	300 Customers	353 Customers	32 Customers
 <p>Strategic Undergrounding</p>	65 Miles 2,533 Customers	26 Miles 242 Customers	15.5 Miles 276 Customers	 <p>Generator Grant Programs</p>	3,000 Customers	2,310 Customers	1,300 Customers
 <p>Microgrids</p>	2 Locations 5 Customers	0 Locations 0 Customers	1 Location 1 Customer	 <p>Generator Assistance Programs</p>	1,250 Customers	735 Customers	

SDG&E Committed to Risk Reduction



WMP PROGRESS

45%

Reduced fault rate
on the distribution
system

84%

Reduced fault rate
on the transmission
system

100%

of Tier 3 HFTD
inspections

100%

of Tier 2 inspections
by end of 2022

100%

Ignition reduction
from fuses
in HFTD

12,500

Trees per year
with enhanced
vegetation clearance

Reducing wildfire risk & PSPS impacts through:

- **Continued preparation** through EOC exercises, community outreach, public education & public safety partnerships
- **Advanced risk modeling** & situational awareness leveraging artificial intelligence
- **Continued grid hardening** by increasing strategic undergrounding & covered conductor (powerlines)
- **Increased customer support** by expanding AFN support services & leveraging renewable resources

Thank you