

# IBEC

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ITY BITTY ELECTRIC CO.

## REQUEST FOR PROPOSAL

**PREPARED BY: DATA IN MOTION**

Bryce Mandap, Jean Millan, Jenny Lam, Jose Ortiz, and Rose Roldan

# Meet Our Team



Bryce Mandap  
*Data Analyst*



Jean Millan  
*Data Specialist*



Jenny Lam  
*Operations Analyst*



Jose Ortiz  
*Utility SME*



Rose Roldan  
*CRM Specialist*

# Overview

- RFP Background
- RFP Scope & Objectives
- System Hardening
- Vegetation Management
- PSPS
- Situational Awareness
- Recommendation
- Benefits
- Conclusion

# RFP Background

- IBEC SoCal Electric Service Provider
- High Fire Risk Areas (HFRA)
- Increase in environmental events
- Negatively affecting overall reliability

# RFP Scope and Objectives



Provide recommendations to:

- System hardening activities
- Vegetation management
- Planned Safety Power Shutoff program
- Situational awareness

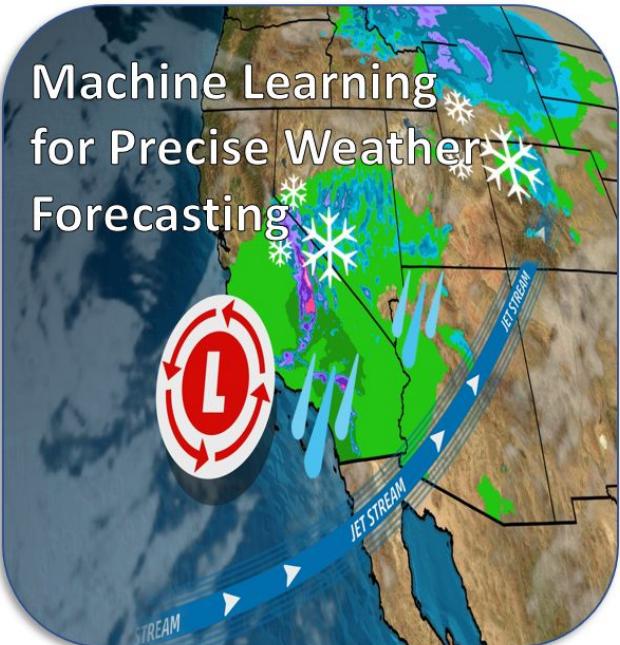
## **Descriptive Analysis for PSPS Customer Insight**



## **Enhancing Vegetation Management with Analytical Techniques**



## **Machine Learning for Precise Weather Forecasting**



## **Upgrading System Hardening**



## **Reducing Power Outage Durations**



## **Increasing Customer Satisfaction**



## **Improving SAIDI & SAIFI**



# System Hardening

A combined system of actions that create a strong infrastructure to better protect utility customers from weather-related outages.

- Outages: Typical vs Natural
- Prioritizing
- Hardening and Resilience
- Innovative Measures

# Prioritizing, Targeting, and Decision Making



There are three types of analytics that businesses use to drive their decision making:

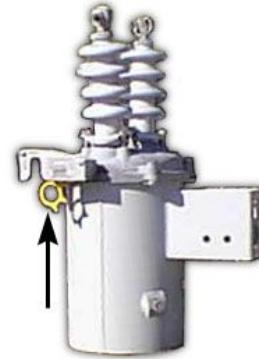
- Descriptive analytics, which tell us what has already happened;
- Predictive analytics, which show us what could happen, and finally,
- Prescriptive analytics, which inform us what should happen in the future.

# Hardening and Resilience

Wind Protection



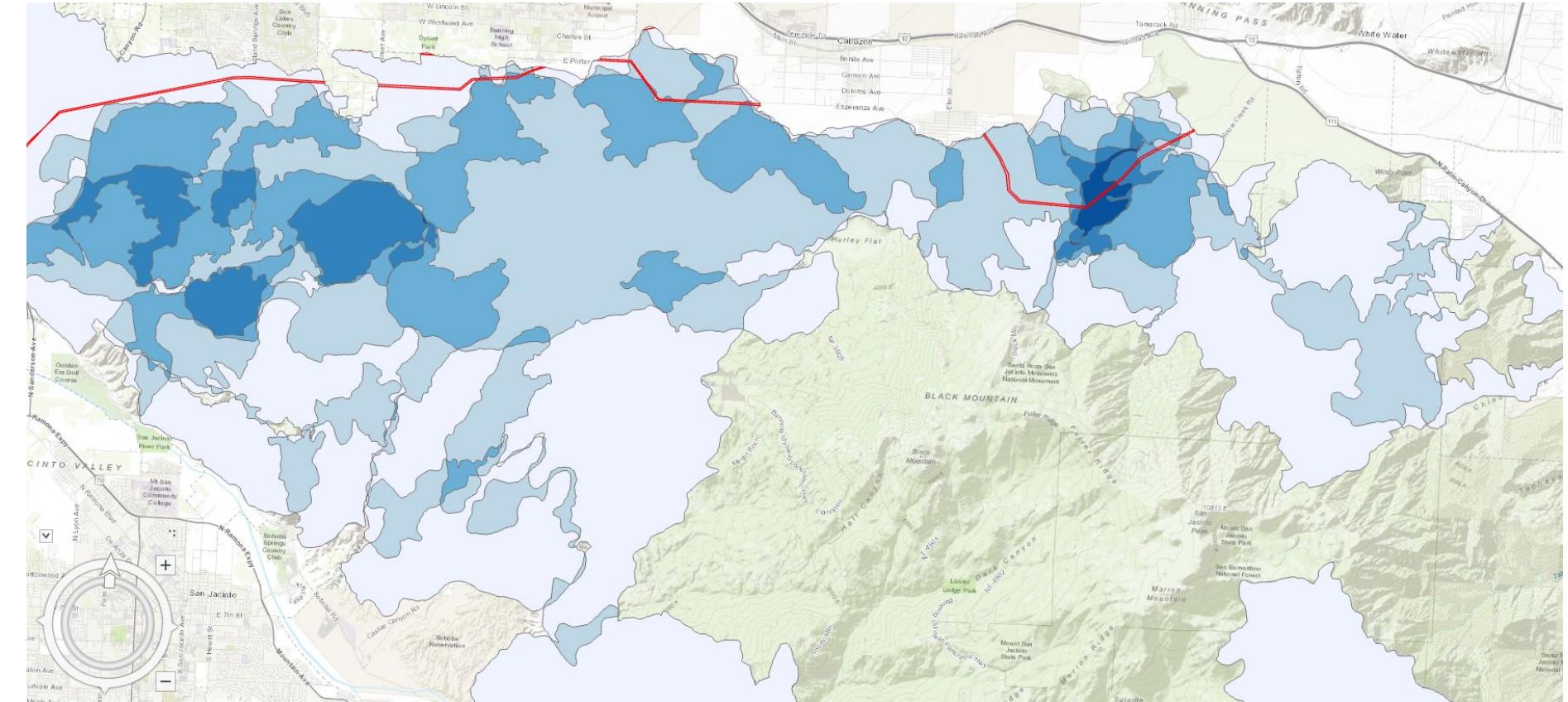
Modernization



# Innovative Measures



"Drone cameras can take high-resolution photos of distribution poles and transmission towers, attached equipment and the surrounding area. Computer vision can be trained to classify what something is, how it should look and spot if something is broken. Machine-learning can analyze images, then identify subtle changes and anomalies, such as the beginnings of corrosion or other damage."



Wildfires from 1984 to 2020 near Black Mountain in the region east of Escondido

# Vegetation Management



- What is it?
- How it is done
- Real world impact
- How it can improve

# Vegetation Management Overview



- Ensures continual service. Prevents wildfires and blackouts.
- Cutting, trimming, and pruning of trees and brush provides a clear perimeter around electrical equipment.
- High Risk Fire Areas require extra attention in vegetation management due to elevated risk.

# Traditional Methods of Vegetation Management



- Crews drive around conducting inspections before any actual work is done
- Potential for disasters such as wildfires that can devastate landscapes or blackouts that can affect millions of consumers

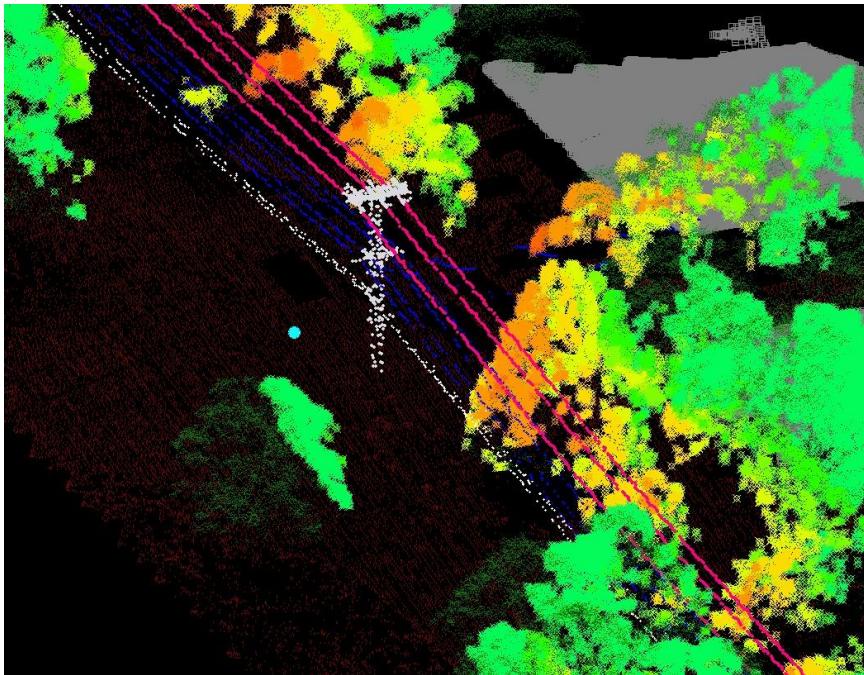
# Why It Matters



- Pacific Gas & Electric Company filed for bankruptcy in January of 2019 to stave off some of the financial burden it was facing due to lawsuits the utility company was entangled in because of wildfires involving equipment from the nation's largest utility company.
- Paradise fire becomes deadliest wildfire in U.S. forcing PG&E to plead guilty to 84 counts of manslaughter in 2018.
- Following the filing for bankruptcy in December of 2019 PG&E settled for \$13.5 billion for fires stemming back to 2017.

*Photo of the 2021 Dixie Fire ravaging lands.*

# Innovative Approach to Vegetation Management



- Technologies can ease burden on crews responsible for identifying and trimming vegetation.
- Database facilitates utilizing historical data and creating reference points for data analysis of equipment location.
- LiDAR visualizes geographic area with digital models

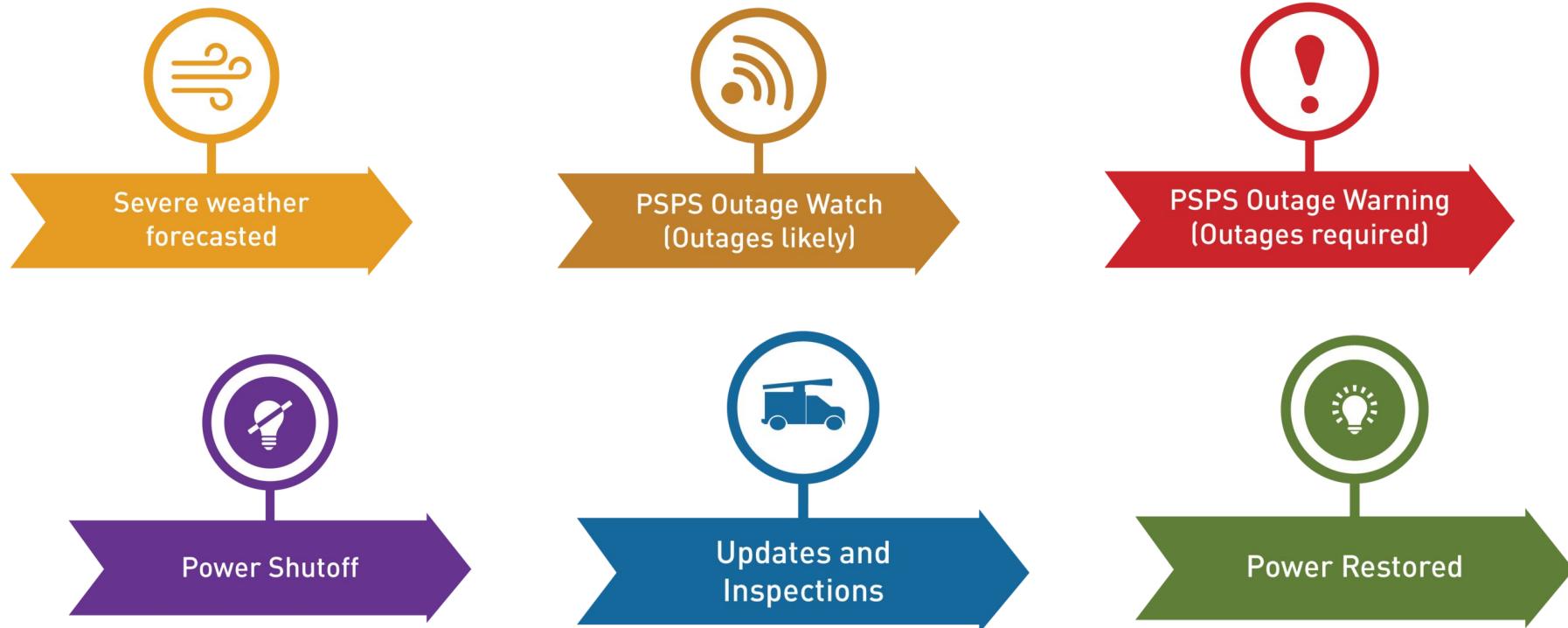
# Public Safety Power Shutoffs

PSPS

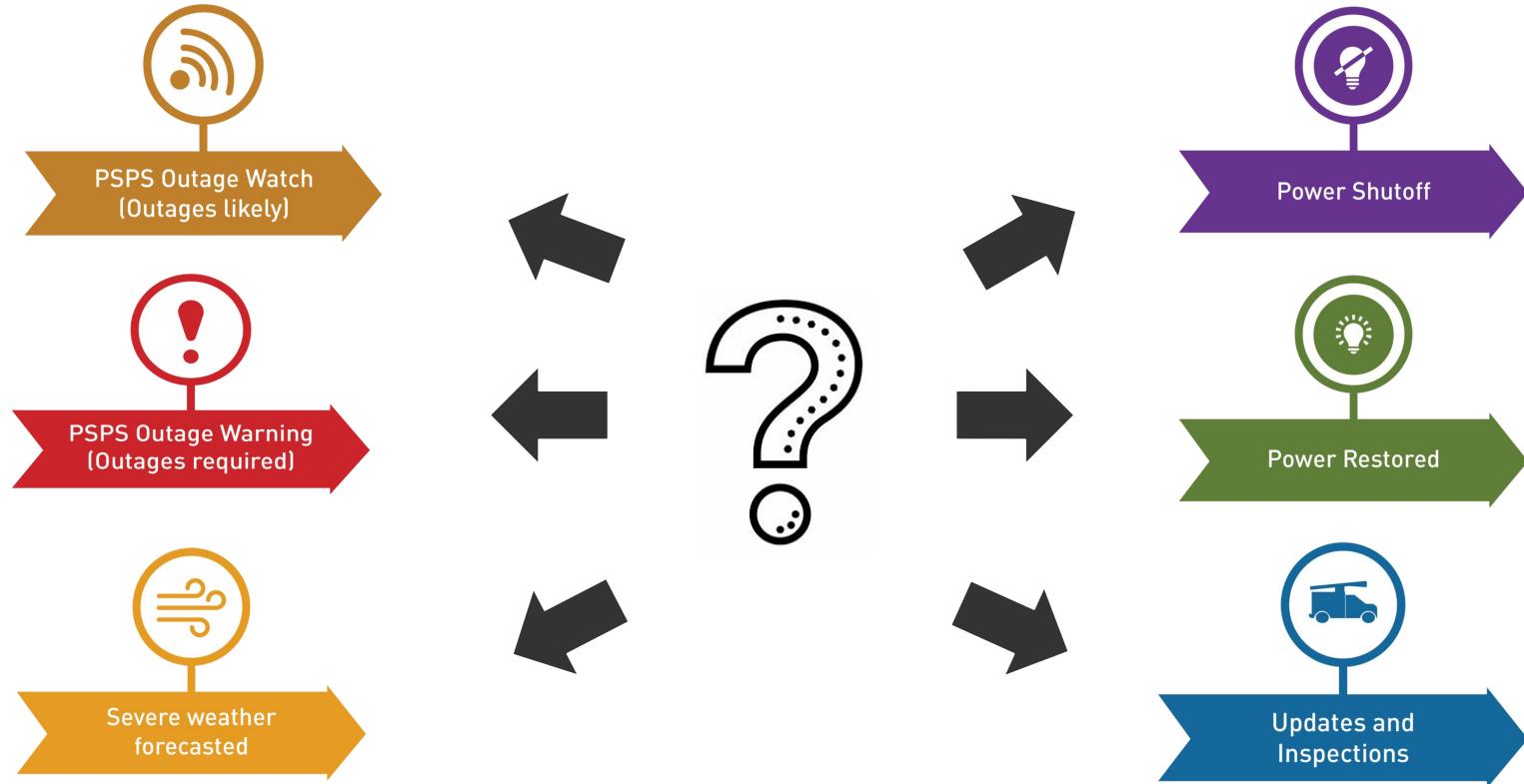


- Overview of PSPS
- Descriptive Analysis on Customer Criticisms
- Improving Forecasting Abilities
- Machine Learning Benefits

# What is a Public Safety Power Shut off?

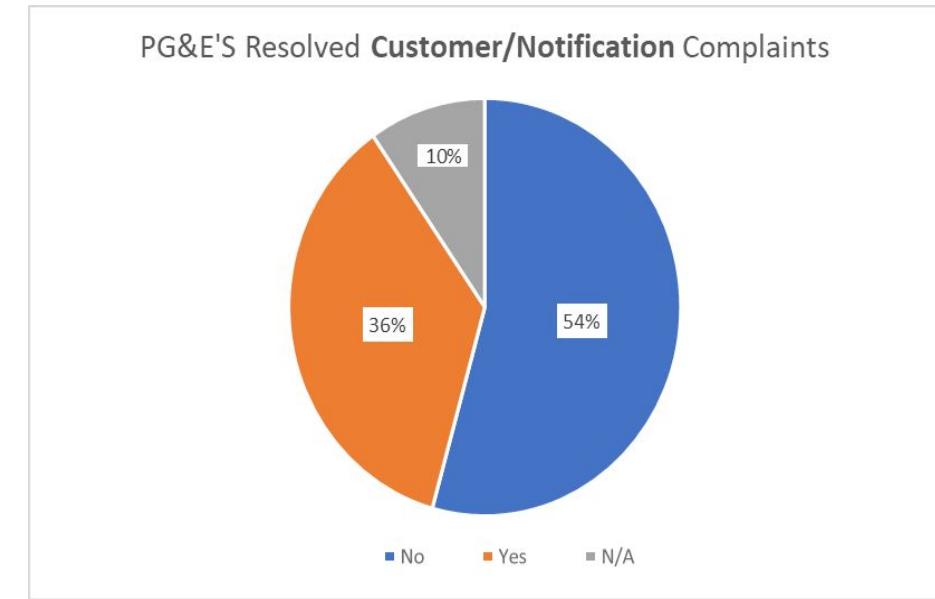
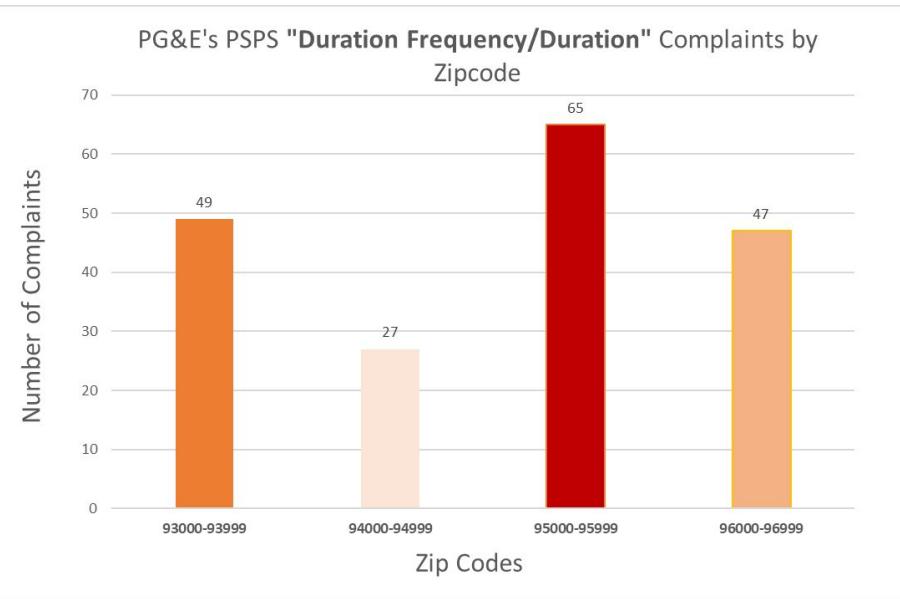


The Last Resort Measure



Where to Deploy IBEC's Resources?

# Analyzing Customer Criticisms



Descriptive Analytics - What is Happening?

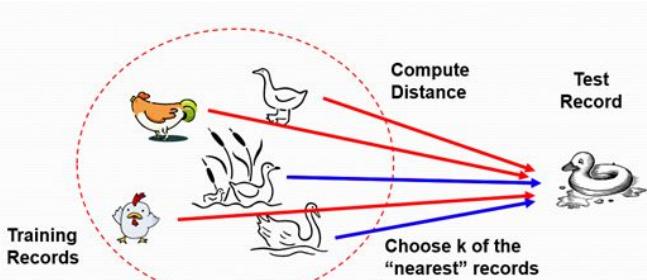
# PSPS Public Safety



# Improved Forecasting Abilities with Machine Learning

## Machine Learning

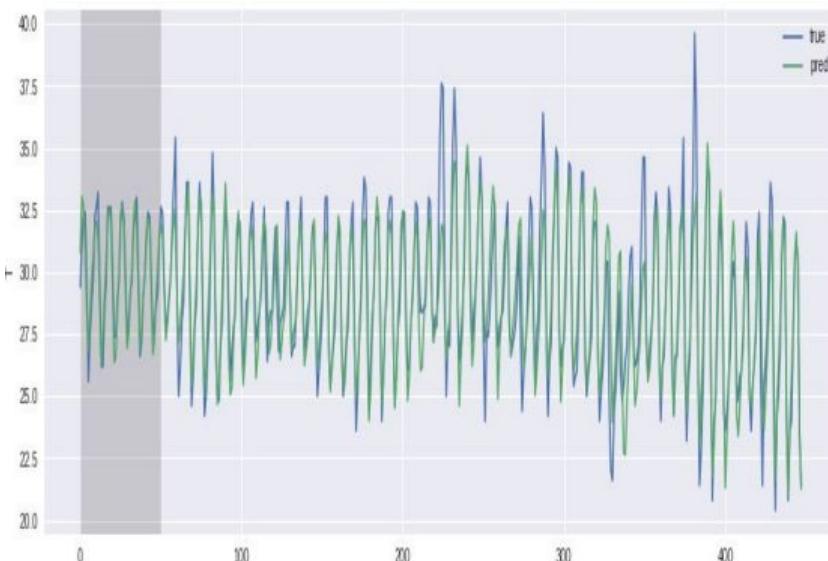
- Computational Algorithm
- Uncovers Unknown Relationships of data
- Predictive Analysis Capabilities
- Self Evaluating Performance Metric
- Centralized on Historical data



**Synoptic.**

Sharing Earth's Data

# Benefits of ML for Weather Forecasting



**Fig 5: actual vs predicted temperature by RNN**



## De-Energization Thresholds

- Triggers when circuits should be turned off
- ML can help predict when triggers will initiate
- Amplifying IBEC's PSPS Situational Awareness

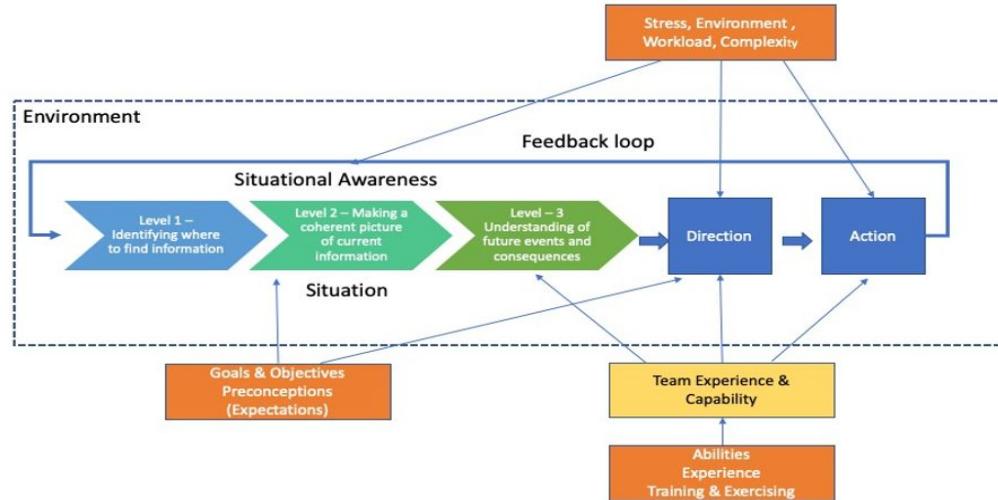
# Situational Awareness



- Reducing Duration of Outage
- Improving Response Time

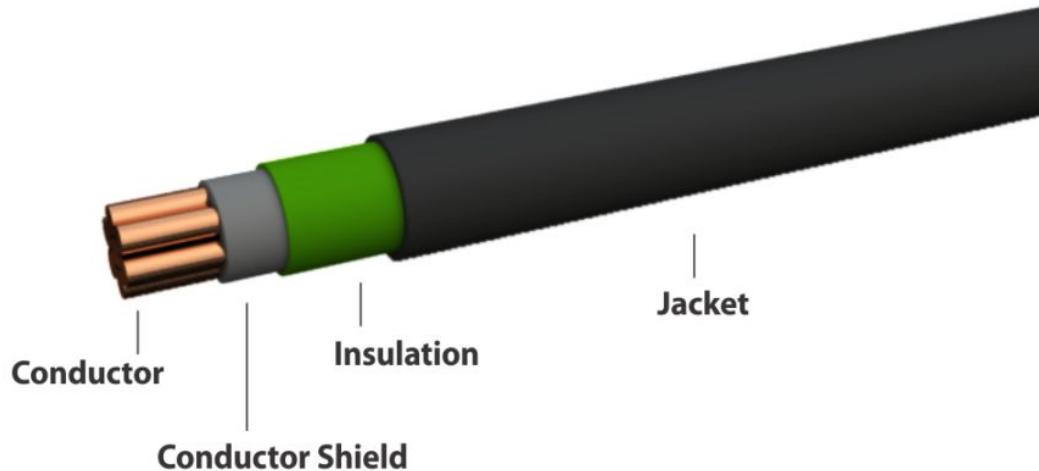
# Reducing Duration of Outage

- Revision of IBEC's plans and processes.
  - SCE: Prioritize pain points such as FICs, resulted 70% reduction in duration of outages.



# Reducing Duration of Outage

- Upgrades on technology and equipments.



*Image: Covered Conductor*

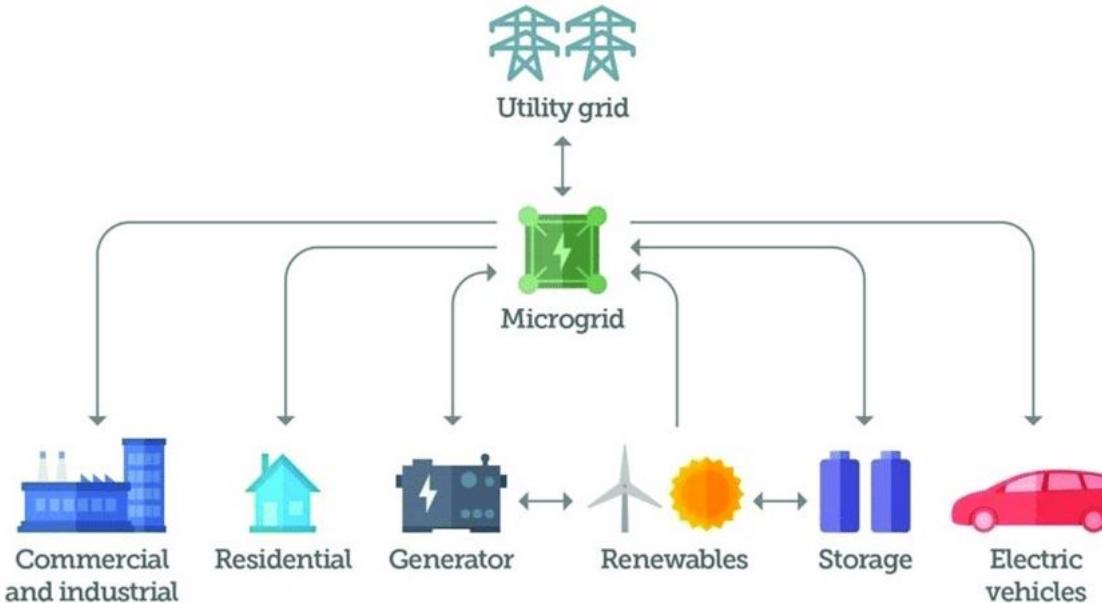
# Reducing Duration of Outage

- Collect feedback and provide consumers resources.



# Reducing Duration of Outage

- Utilize alternative backup power supply options.



# Improve Response with Consumers



- Customer Notifications
- Customer Research through Community Meetings

# Customer Notifications

- Automated notifications based on weather forecast.
- Notifications through call, text, or email.
- Provide notifications on PSPS improvement/enhancements.



# Community Meetings and Customer Research

- Virtual or in person meetings
- 
- Customer research in order to identify and access needs which can be integrated into descriptive analytics studies for better understanding.



# Recommendations



- Implement data analytics.
- Utilize machine learning to prioritize equipment for hardening.
- Utilize LiDAR for modeling of geographical areas of equipment for purposes of vegetation management.
- Implement descriptive and predictive analytical tools in PSPS operations for cases such as customer complaint identification and weather forecasting.

## Benefits to IBEC



# Conclusion

Integrating data analytics into IBEC's operations will provide confidence and reassurance in decisions made to enrich their business with actionable insight to combat future damages and limit liability in an area increasingly affected by environmental disaster.



# Questions?