

# Pacific Power's 2021 California Electric Reliability Report December 8, 2022



# Introduction & Welcome

*Todd Andres: Pacific Power Business Manager for Southern  
Oregon & Northern California*

*Kevin Benson: PacifiCorp Director of Asset Risk*

# Proudly Serving Northern California



## Service area

- Number of customers in the state: 47,279

## Line miles

- Transmission, all states: 17,771
- Distribution, all states: 65,812

## Number of employees

- 43 employees

## California grants and charitable donations in 2021

- Corporate: \$27,528
- Pacific Power Foundation: \$53,420

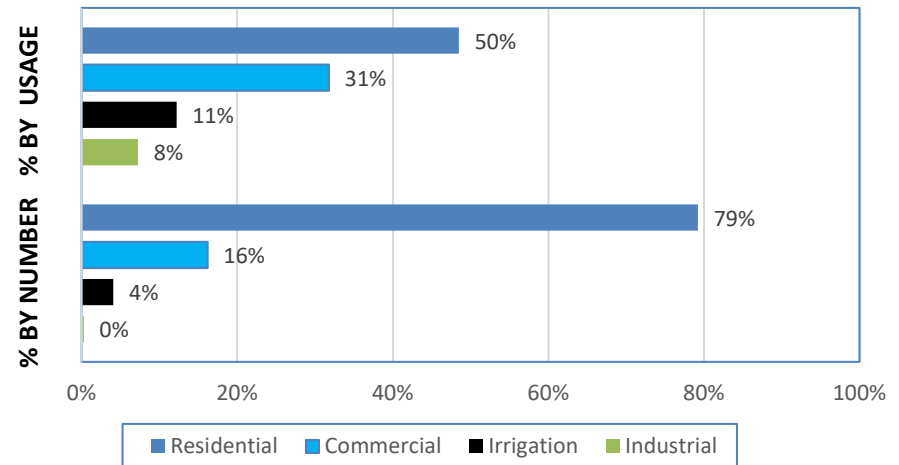
## California property taxes and fees paid for 2021

- Franchise Tax: \$1,224,866
- Property Tax: \$2,827,733

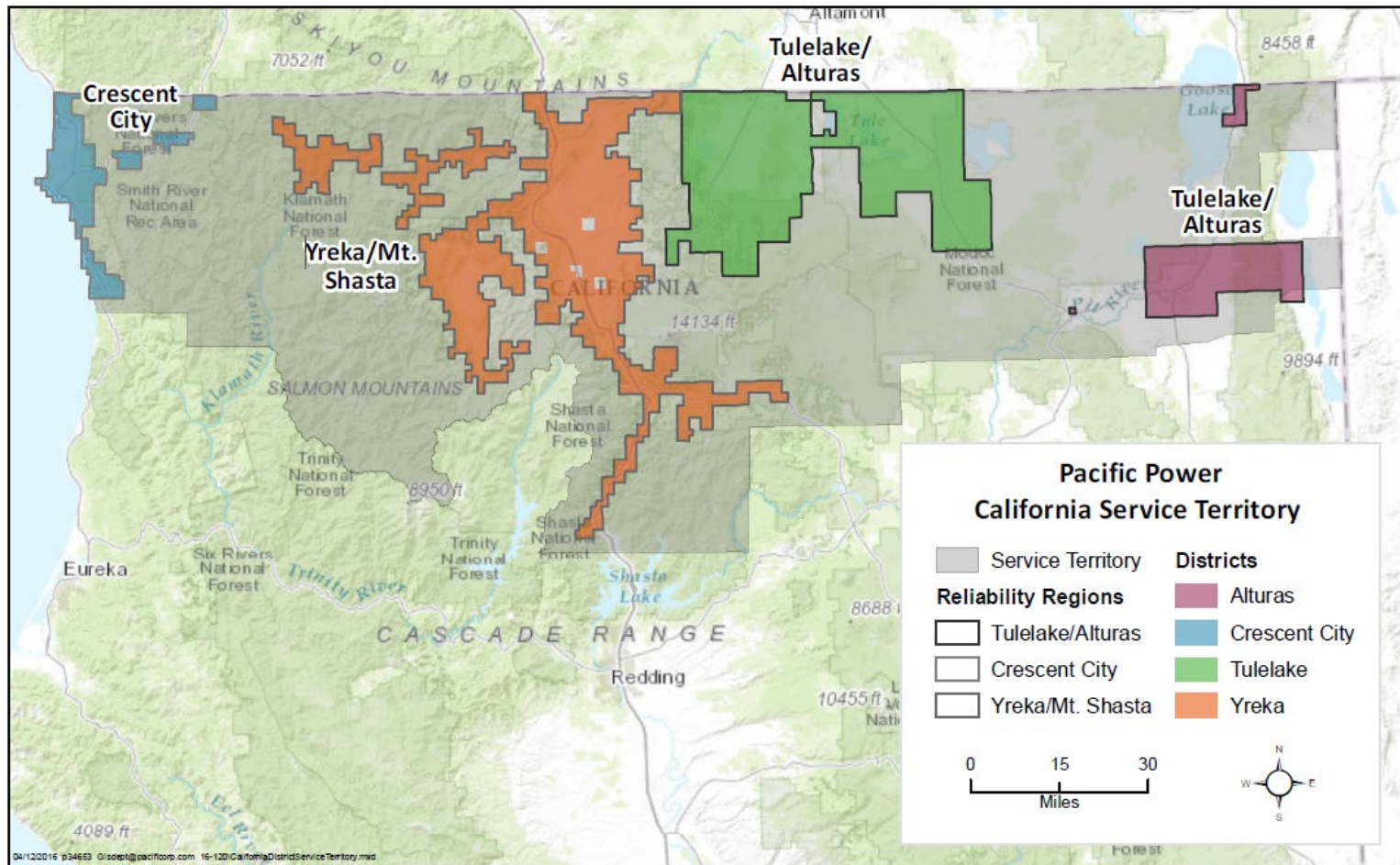
# Proudly Serving Northern California



California customer mix by percentage



# Service Territory



# Promising Excellent Service

Our Customer Service Guarantees help ensure we're delivering to the highest standards.

Guarantees cover:

- Restoring power after outages
- Keeping appointments
- Switching on power
- Estimates for new power supply
- Billing questions
- Meter problems
- Planned interruptions

Should we fail to meet certain program features, you can file a claim and be eligible for a credit of \$50.

# Concurrently Focused on Clean Energy Future

- Our 2021 Integrated Resource Plan identifies demand side resources, renewable energy, storage and nuclear all with a goal of reduced carbon emissions consistent with state targets.
- 69% reduction of greenhouse gas emissions from 2005 levels by 2030.
- See more at:

<https://www.pacificorp.com/energy/integrated-resource-plan.html>

# Planning for Improved Wildfire Resilience

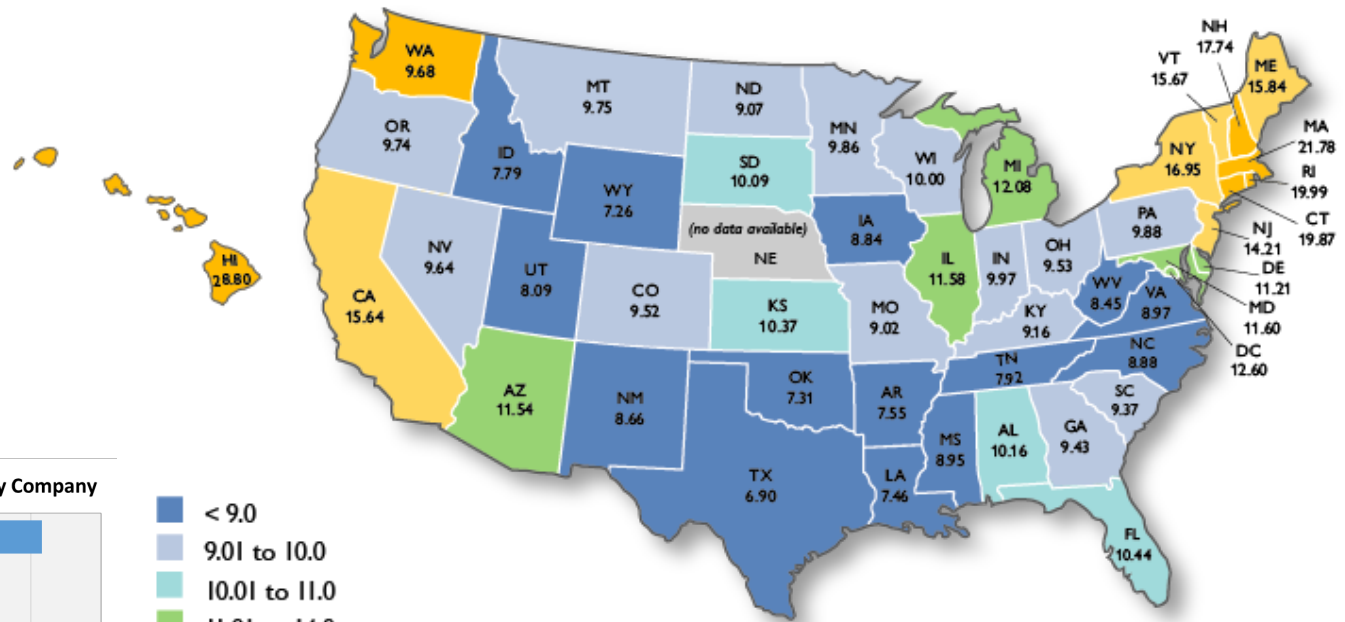
Since 2019 PacifiCorp has been developing and implementing its Wildfire Mitigation Plan, including tactics such as:

- Changing operational practices during periods of high risk
- Augmenting its emergency, meteorology and operational teams for real time response, including enhanced situational awareness
- Enhanced inspection, correction and vegetation management actions
- Hardening facilities for wildfire risk, including new protection control equipment and covered conductor

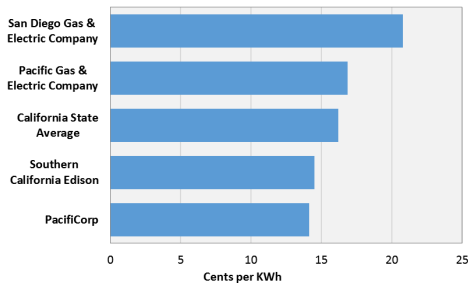


# US Energy Prices

Total retail average rates by state  
(cents per kilowatt-hour)



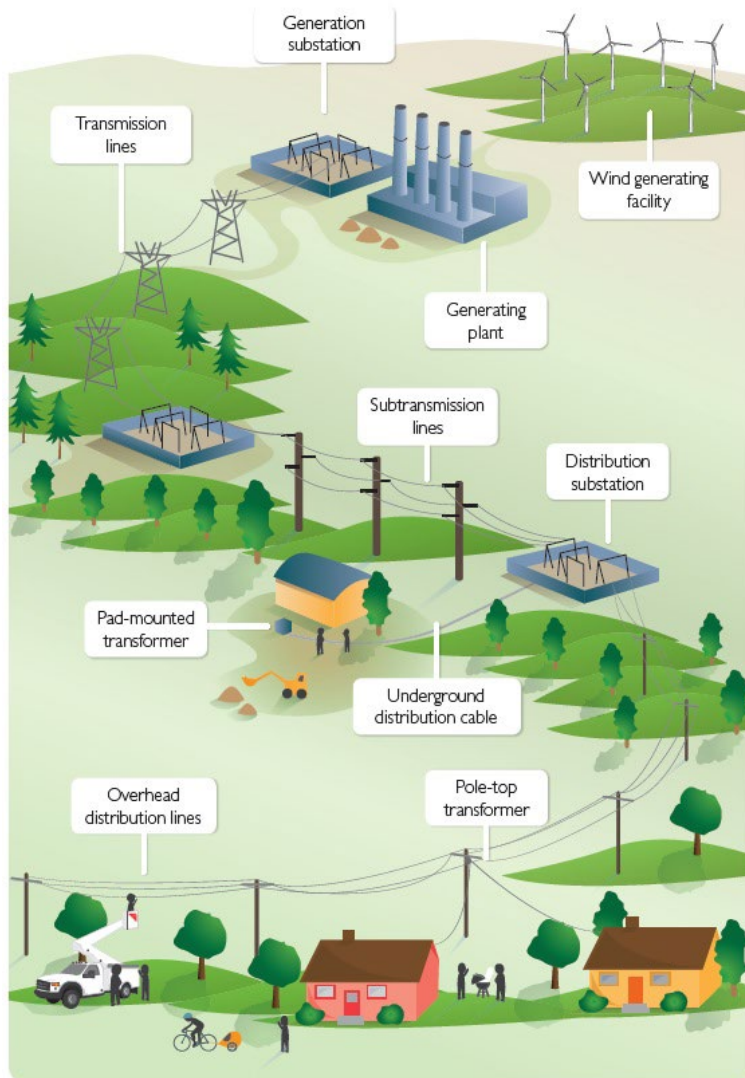
California Total Retail Average Rates by Company



Reflects total retail average rates for 12 months ending in December 2019.  
Source: Typical Bills and Average Rates Report, Winter 2019, Edison Electric Institute.

# Delivering Reliable Electric Service

# Power Delivery System



## Restoring power



The drawing above depicts our priorities during an outage.

- 1 Dispatch crews and assess conditions for public and crew safety.
- 2 Patrol lines and check substations.
- 3 Clear downed power lines.
- 4 Restore power to the greatest number of people as quickly as possible through first clearing transmission lines that can serve multiple substations.
- 5 Restore power to substations that convert high-voltage power to levels people can safely use at home.
- 6 Restore power to concentrated areas through distribution and tap lines. Distribution lines travel from the substations to neighborhoods and serve between 1,000 and 3,000 customers. Tap lines then feed into pockets of 20 to 30 homes.
- 7 Restore power to individual (typically suburban or rural) homes and businesses. This task usually takes the longest.

# Why Are There Power Interruptions?

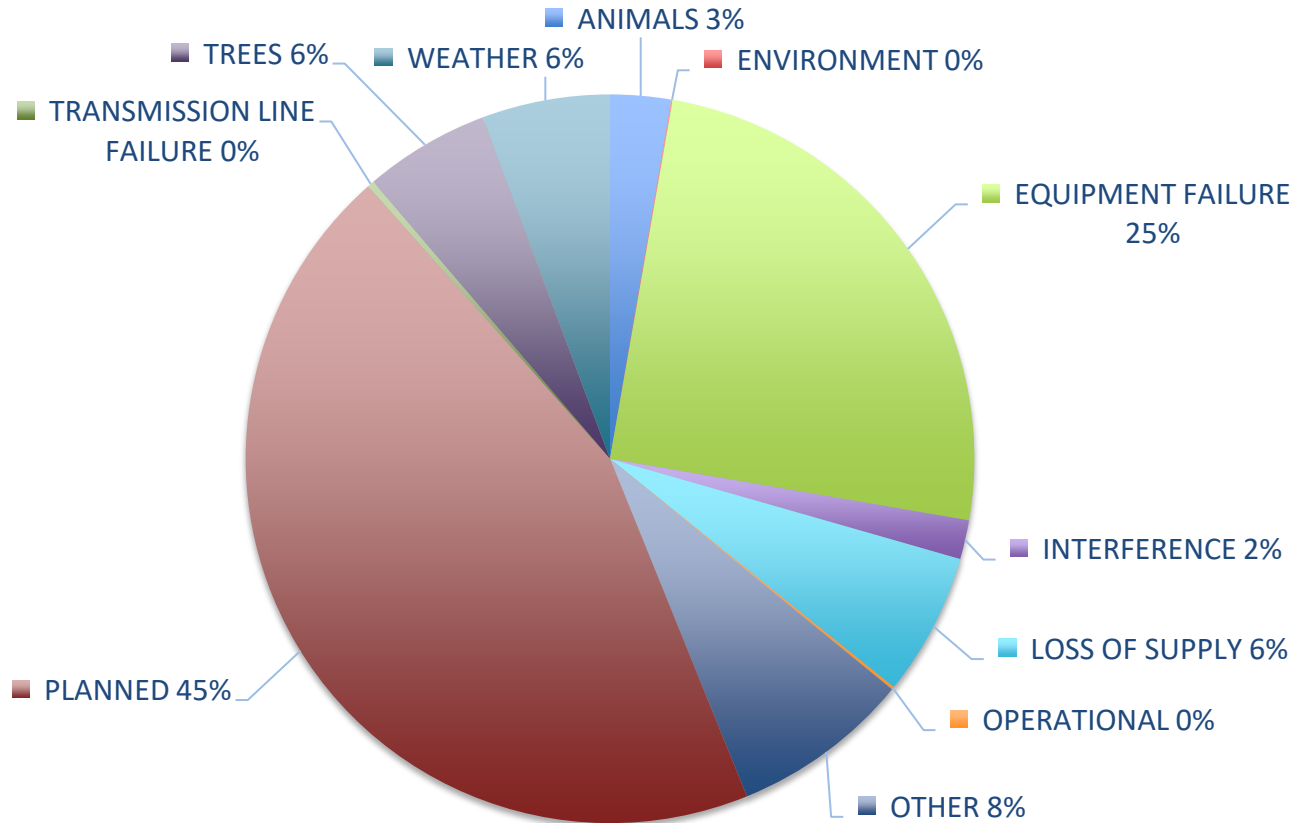
- Faults occur when unexpected objects contact the power lines or when equipment fails
- An outage is a designed response to a fault event. If the fuses or other protective devices didn't exist, the system would create bigger outages and pose safety risks
- When possible, we attempt to respond to certain faults by having equipment de-energize and then quickly re-energize, which may cause a short interruption in power, but avoids the time it takes for a crew to respond
- In other cases, a trouble-man or crew response will be required and the restoration time will vary depending on what work is required
- Normally, outages impact small numbers of customers, however sometimes these events can occur on the transmission system or in a substation and they will affect larger amounts of customers, as shown on the previous slide

# Key Causes of Power Outages

- Weather and its effects: trees or branches knocked down by wind, snow or ice into power lines
- Lightning strikes a transformer or other electrical facilities
- Car accidents where utility poles are knocked over or sway enough to knock the lines together and trip off the circuit
- Equipment overload, especially on hot days when air conditioning is cranked up, or during extremely cold weather when electric heaters are turned on all over the system
- Animals that contact the lines
- Digging too close to lines or cutting into a line
- Sometimes the outage is a result of a circuit overload within your own home. Check your fuses and breakers first. If they continue to trip off, call a local electrician to handle the problem.

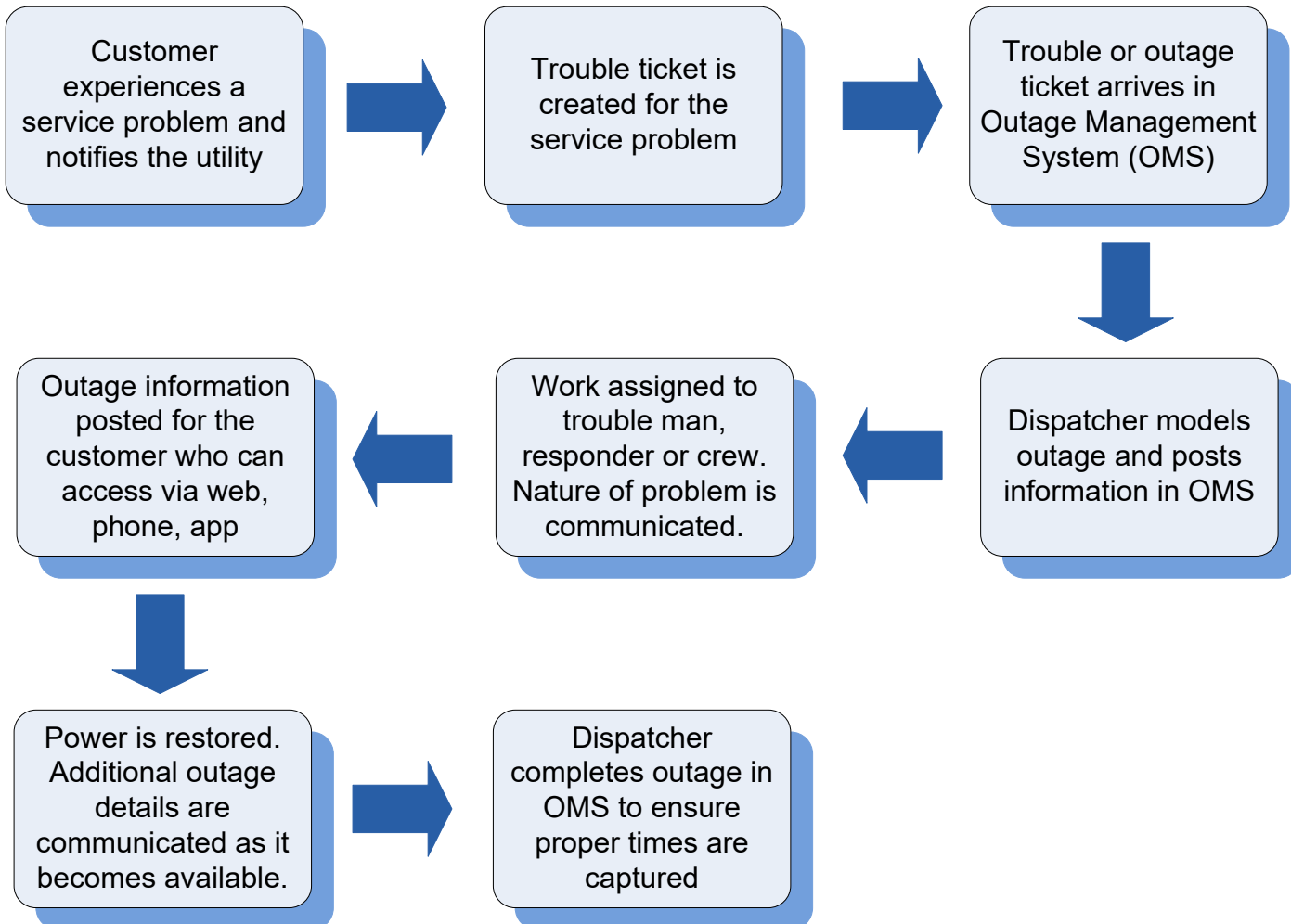
# California Outages by Cause

## Cause Analysis - Underlying SAIDI (minutes)



# Customer and Company Communication Processes

# Typical Outage Restoration Process





# Outage Map on Smart Devices

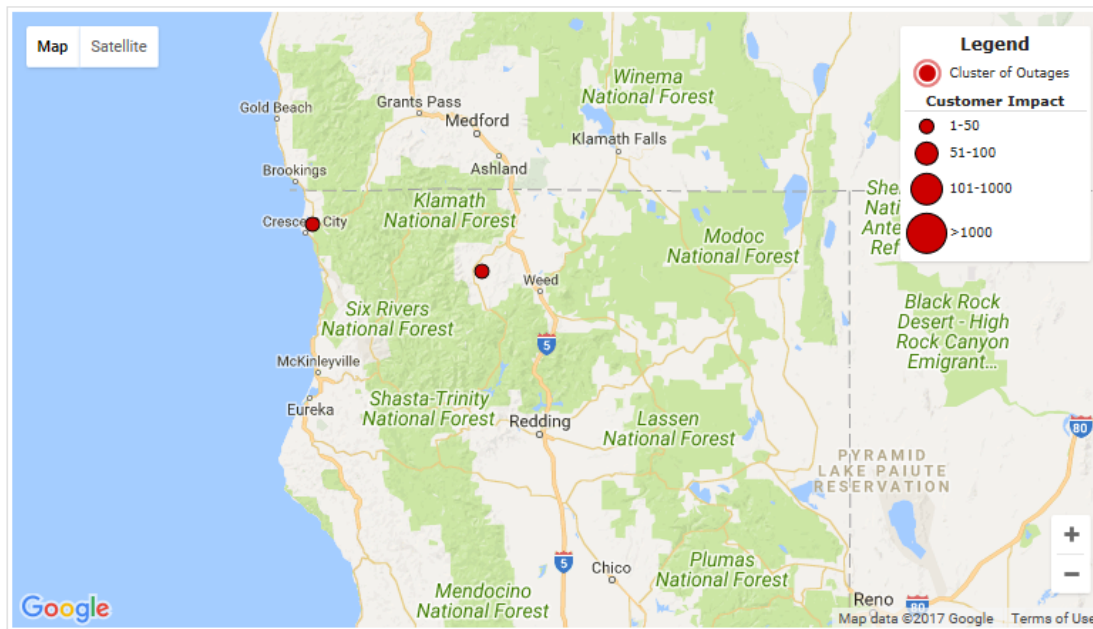
<https://www.pacificpower.net/outages-safety.html>

## California Outages Map

There are 3 outages in California affecting 3 customers.

Report an Outage

List of Outages



Map last updated Friday, September 22 03:00 PM, 2017.

Outage locations generalized to protect customer privacy. Information is typically refreshed every 15 minutes. Understanding the map and estimated time of restoration.



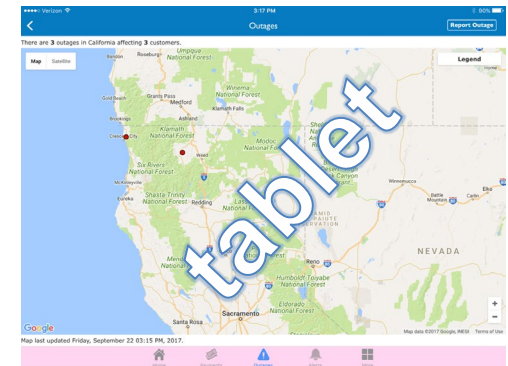
Report Outages 24/7: **1-877-508-5088**



Storm Center: Check out our storm and safety information

### California Outages Map

There are 3 outages in California affecting 3 customers.



# Outage Updates Your Way

**PACIFIC POWER** Moving > Careers > About Us > Contact Us  
Advanced Search

Your Account Residential Business Contractors Efficiency & Environment Safety & Outages

Your Account > Your Alerts

**Your Account**  
View & Pay Bills  
Ways to Pay  
Know Your Bill  
Your Alerts  
View Usage  
Online Profile & Account Information  
Start, Stop or Move  
Power Options  
Landlord Information & Programs  
Report Power Outage  
Online Profile & Account Information

**Your Alerts**  
Hide account info  
**LAMAR**  
696 12TH ST SE STE 130  
SALEM, OR 97301 4015  
Call: 541-461-0972 | Edit  
Email: nadine.may@pacificorp.com | Edit  
Text: 123-456-9876 | Edit

**Electric Account**  
LAMAR  
1171-002 9 active  
Update account nickname  
View site address(es)

Welcome, PCUser2!  
You are logged in.  
Log Out  
Manage online profile

**Customer Service**  
Customer service  
1-888-221-7070  
Start service  
Report a power outage  
1-877-508-5088  
Report a streetlight outage

Select your alert preferences below:

**Billing & Payment**

**Billing Notice**  
Includes the amount due and due date when your bill is ready. With the email option, we can attach a copy of your bill to the email alert. Selecting the billing notice alerts does not change your paperless status.  
☐ Email ☐ Text

**Payment Due Reminder**  
Get an alert a few days before your payment is due if your bill has not been fully paid.  
☐ Email ☐ Text

**Payment Confirmation**  
Get an alert when your payment is applied to your electric account.  
☐ Email ☐ Text

**Power Outage**

**Outage Updates**  
When an outage is reported at your location, get alerts when power is expected to be restored and when it is back on.  
☐ Email ☐ Text ☐ Call

**Programs & Account Info**

**Service & Account Info**  
Information and services to help you save energy, support renewable power and more. This includes newsletters.  
☒ Email ☐ Text

Cancel Continue

Pacific Power App  
Save time with our free mobile app. Get it on the App Store® or Google Play™.

Home > Español > Site Map > Privacy > Terms of Use > Request Information > Contact Us  
©2015 Pacific Power, a division of PacifiCorp and part of Berkshire Hathaway Energy

**PACIFIC POWER** Moving > Careers > About Us > Contact Us  
Advanced Search

Your Account Residential Business Contractors Efficiency & Environment Safety & Outages

Your Account > Online Profile & Account Information > Your Online Profile

**Your Account**  
Online Profile & Account Information  
Your Online Profile  
Remove Profile  
Your Account Information  
Add Electric Account  
Remove Electric Account  
Paperless Billing  
Return to the full Your Account menu

**Your Online Profile**  
Use the fields below to update your personal information or change your preferences.

**Text Alert Number**

**Step 1: Enter Your Number**  
Please enter your number and click Send authorization code below.  
Text Alert Number: 123 456 9876 Send authorization code

**Step 2: Enter Authorization Code**  
Enter the authorization code we sent you.  
Authorization Code:

Message and data rates may apply. Message frequency will vary. Mobile carriers are not liable for delayed or undelivered messages. You can opt out at any time by sending the word STOP to 722797. For help with texting, send the word HELP to 722797 or call us at 1-800-538-4228. Terms and Conditions

Cancel Submit

**Email** Edit

E-mail: nadine.may@pacificorp.com

**Name and Password** Edit

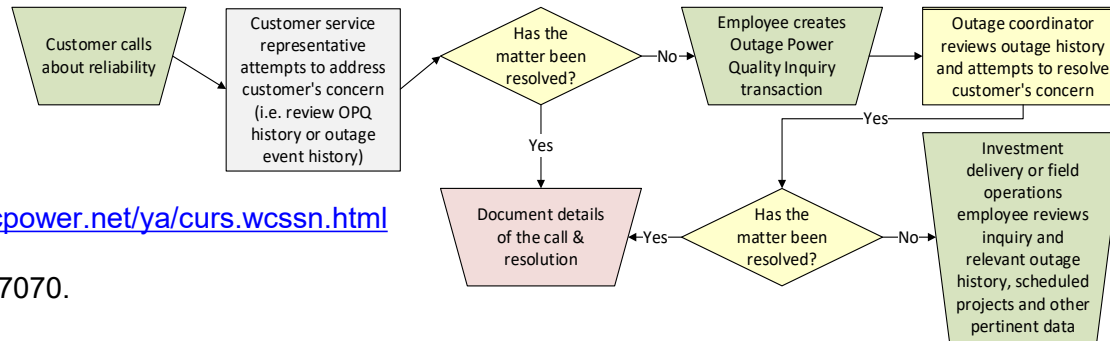
First name: PCUser2  
Last name: PCUser2  
Password: Change

Welcome, PCUser2!  
You are logged in.  
Log Out  
Manage online profile

**Customer Service**  
Customer service  
1-888-221-7070  
Start service  
Report a power outage  
1-877-508-5088  
Report a streetlight outage

# Customer Reliability Communications

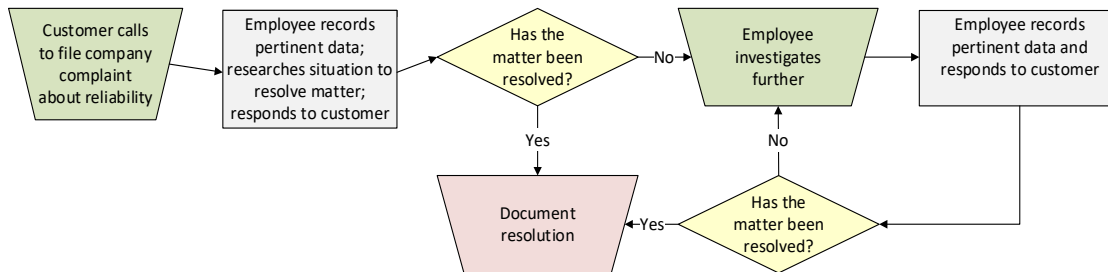
## Outage Power Quality Inquiry



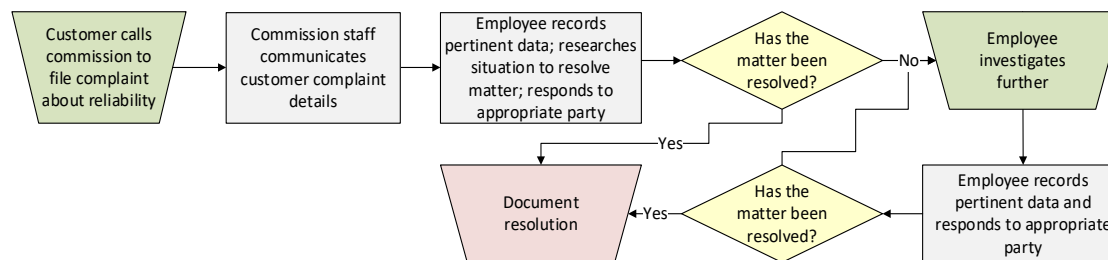
<https://www.pacificpower.net/ya/curs.wcssn.html>

Or call 1-888-221-7070.

## 1-800 Complaint



## Commission Complaint



# Measuring and Improving Reliability

# Outage Classifications

**The company classifies outages according to industry definitions, in Institute of Electrical and Electronics Engineers (IEEE) standards.**

## **Momentary Outage**

An outage less than 5 minutes in duration.

## **Sustained Outage**

An outage equal to or greater than 5 minutes in duration.

## **Planned Outage**

Outages which are customer or public official-requested or where the company has provided notice to the customer.

## **Major Event**

A set of outages which occurred during a specific time and location and, once combined, exceeds historically expected outage duration (SAIDI) for at least one day (as defined in IEEE 1366-2012)

# Standard Reliability Measures

**SAIDI** - (system average interruption duration index)

The average duration summed for all sustained outages a customer experiences in a given time-frame.

**SAIFI** - (system average interruption frequency index)

The frequency of all sustained outages that the average customer experiences during a given time-frame.

**CAIDI** - (customer average interruption duration index)

The result of dividing the duration of the average customer's sustained outages by frequency of outages for that average customer. It represents the average duration of an outage.

**MAIFle** - (momentary average interruption event frequency index)

The frequency of all momentary interruption events (< 5 minutes) that the average customer experiences during a given time-frame.

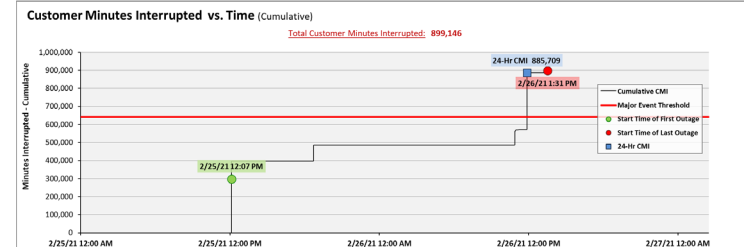
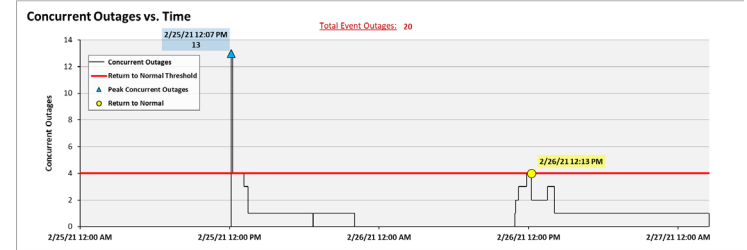
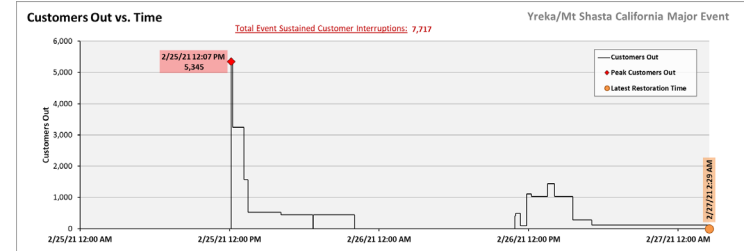
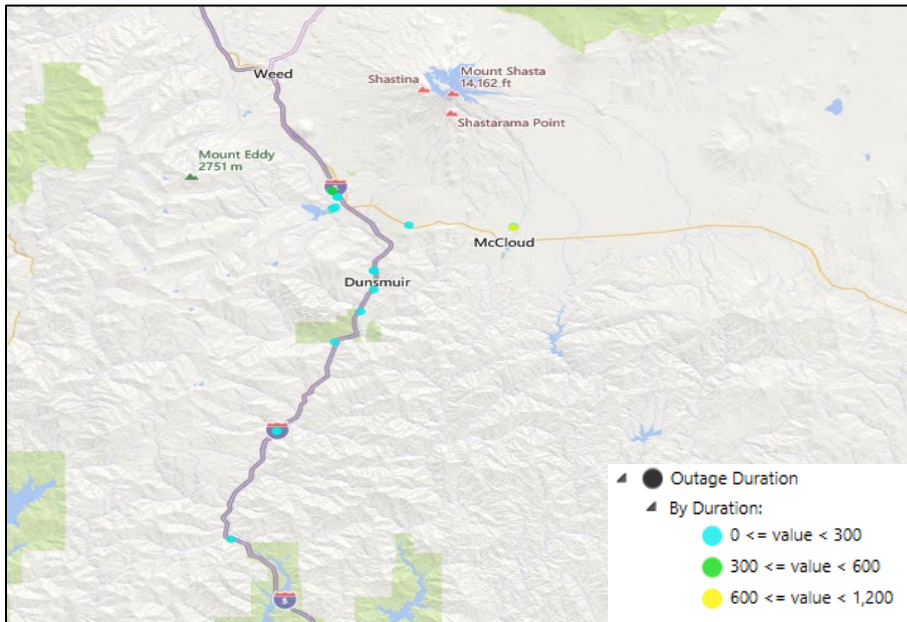
# Major Events

2021 Major Event Summary

Date	District	Cause	Customers out for a duration of:					
			5 min - 3 hrs	3 - 24 hrs	24 - 48 hrs	48 - 72 hrs	72 - 96 hrs	96 + hrs
January 3, 2021	Tulelake/Alturas	Loss of Substation	1,305	-	1,305	-	-	-
January 12-13, 2021	California (State)	Loss of Transmission Line	1,538	647	138	753	-	-
January 26-28, 2021	California (State)	Loss of Substation	26,846	25,361	1,485	-	-	-
February 19, 2021	Crescent City	Landslide	761	6	755	-	-	-
February 25-27, 2021	Yreka/Mt Shasta	Loss of Transmission line and Damaged Equipment	7,717	5,726	1,991	-	-	-
March 5, 2021	Crescent City	Loss of Transmission line and Damaged Equipment	3,723	2,507	1,216	-	-	-
June 22, 2021	Tulelake/Alturas	Loss of Transmission line and Damaged Equipment	5,240	5,240	-	-	-	-
July 4-5, 2021	Yreka/Mt Shasta	Loss of Transmission line	5,612	4,663	949	-	-	-
August 23-24, 2021	California (State)	Loss of Transmission line	10,081	4,319	5,762	-	-	-
November 8-9, 2021	California (State)	Tree and wind outages	4,201	2,651	797	753	-	-
November 13-14, 2021	Tulelake/Alturas	loss of transimission line due to car hit pole	1,137	817	320	-	-	-
December 12-14, 2021	California (State)	Loss of Substation	12,474	11,709	765	-	-	-
December 15-17, 2021	California (State)		25,804	23,822	828	1,060	94	-

# Major Event Example

February 25-27, 2021: Winter Storm



Outage Cause Impact During the Major Event		
Outage Cause	Total Customer minutes lost	Total Customers Impacted
OTHER	5%	3%
EMERGENCY DAMAGE REPAIR	3%	2%
LOSS OF TRANSMISSION LINE	1%	1%
TREE - NON-PREVENTABLE	75%	74%
WEATHER (SNOW, SLEET, WIND)	17%	21%
Grand Total	100%	100%



# Improving Reliability

- Reliability Work Includes:

- 1) Installation or replacement of devices, such as fuses, recloser or breaker, that can limit how much of the circuit may be involved when a fault event occurs
- 2) Replacement of equipment which may no longer be functioning in a reliable manner, as an example, replacing deteriorated underground cable
- 3) Hardening the circuit so that it is more resilient to events which could result in a fault, such as targeted tree trimming or animal guarding

- Cost Effective Improvements

- 1) evaluates performance across the system, and
- 2) determines for historic outages what actions could be taken to either eliminate them or minimize the effect for the specific cause, then
- 3) it calculates a cost per avoided customer minute interrupted, and
- 4) rank orders the most impactful and lowest cost projects, then
- 5) constructs the work and evaluates the effectiveness of the project.

# History of Improving Reliability in California

Annually the company evaluates the system's performance and looks for opportunities to improve reliability based upon outage events; this assessment has led to these projects below.

Year	California Circuit Projects
2012	7
2013	17
2014	5
2015	5
2016	12
2017	8
2018	12
2019	9
2020	5

# Reliability Current Efforts

## ■ Worst Performing Circuits

We calculate a performance indicator value for each circuit that

- considers how long the customers were without power (SAIDI),
- how many times they have been interrupted for both sustained (SAIFI) and
- short outages (MAIFI).

*This metric excludes outages which are Planned, Transmission, or Major Events.*

## ■ Targeted Reliability Projects

In addition, the company also selects other projects that are targeted to improve reliability, building on the success we've had with our reliability program

# Improving Reliability

## Three Selected Worst Performing Circuits

Top 3 Worst Performing Circuits			
Circuit Name	Sawmill (5R171)	Shasta Spr (5G69)	Red Rock (4L3)
District	Crescent City	Yreka/Mt. Shasta	Tulelake
Customer Count	419	523	463
Substation Name	Yurok	North Dunsmuir	MacDoel
Circuit-Miles	64 miles	41 miles	381 miles
% OH	89%	88%	98%
% UG	11%	12%	2%
# Breaker/Recloser Operations	46	46	1
CPI99 Baseline	137	120	138
Preferred Baseline	109	96	110

Reliability  
Performance  
Measure

Target  
Performance  
Measure

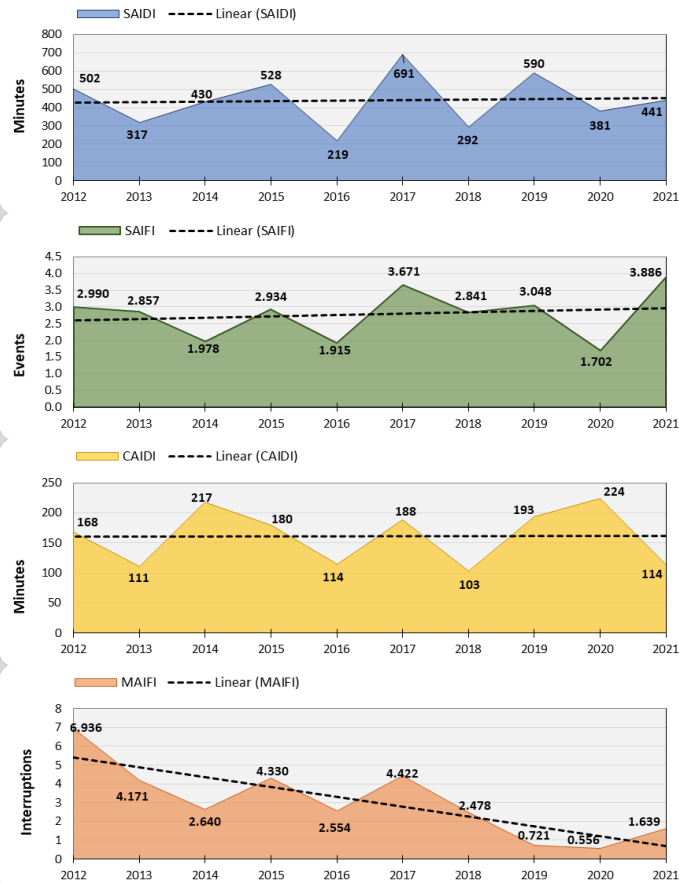
# State & District Performance

# 10 Year State Reliability Results

## Combined - Transmission and Distribution

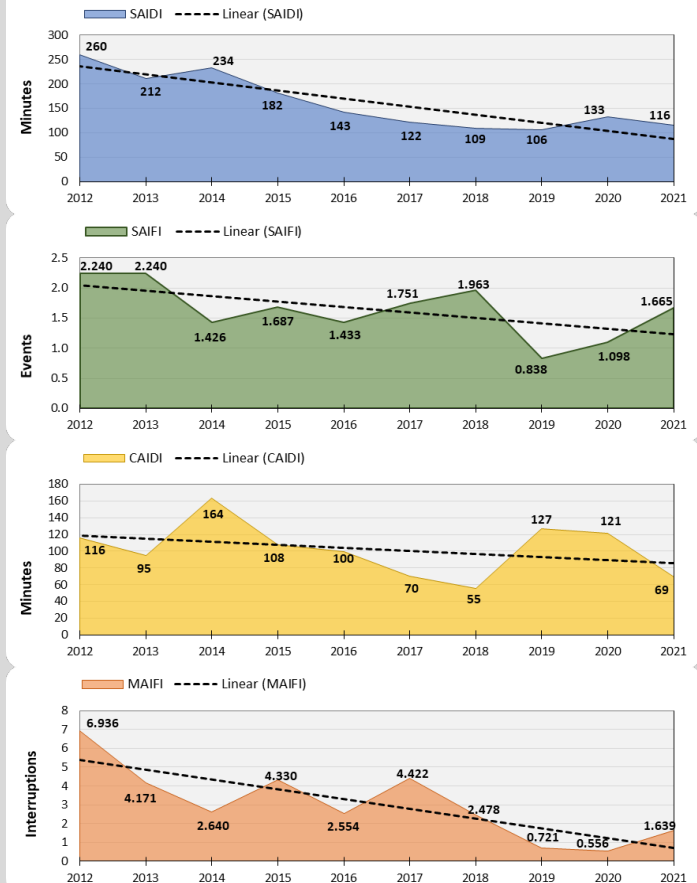
### Including Major Events

Transmission and Distribution Reliability History - Including Major Events  
(excludes customer notice given and customer requested)



### Excluding Major Events

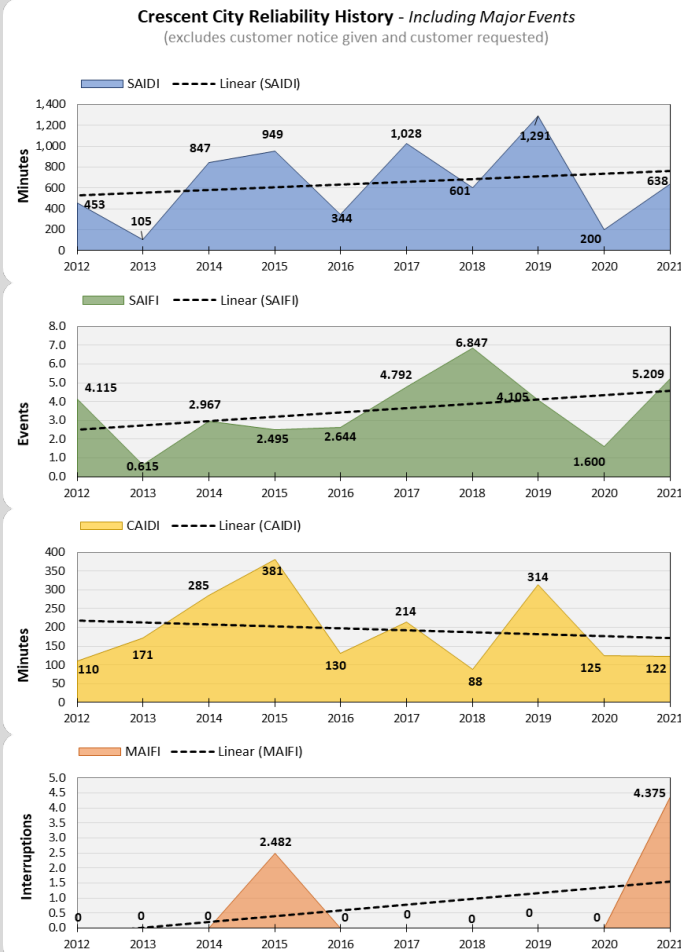
Transmission and Distribution Reliability History - Excluding Major Events  
(excludes customer notice given and customer requested)



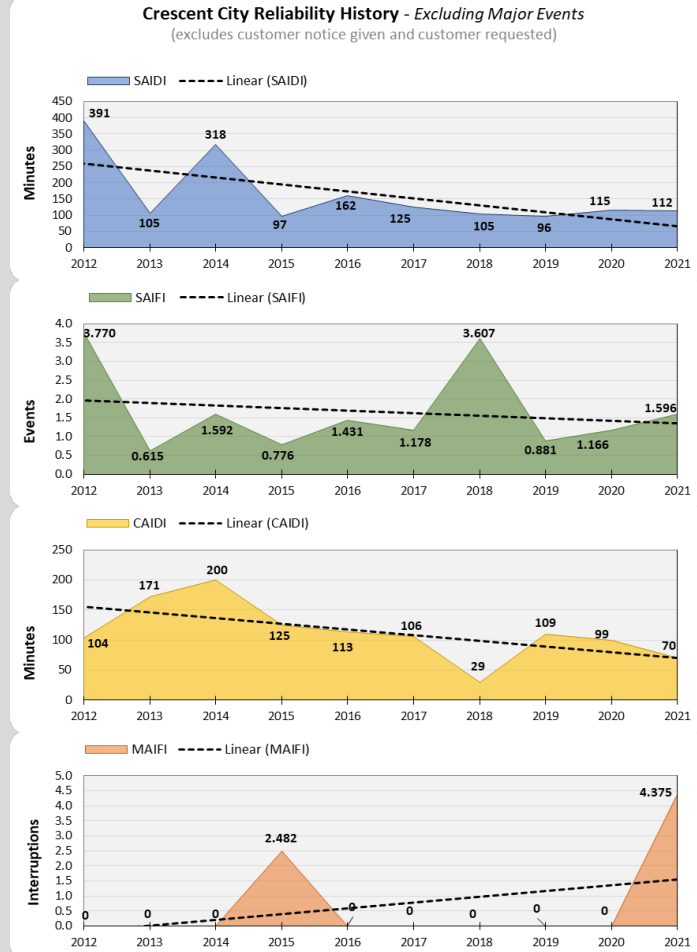
# 10 Year Crescent City Reliability Results

## Combined - Transmission and Distribution

### Including Major Events



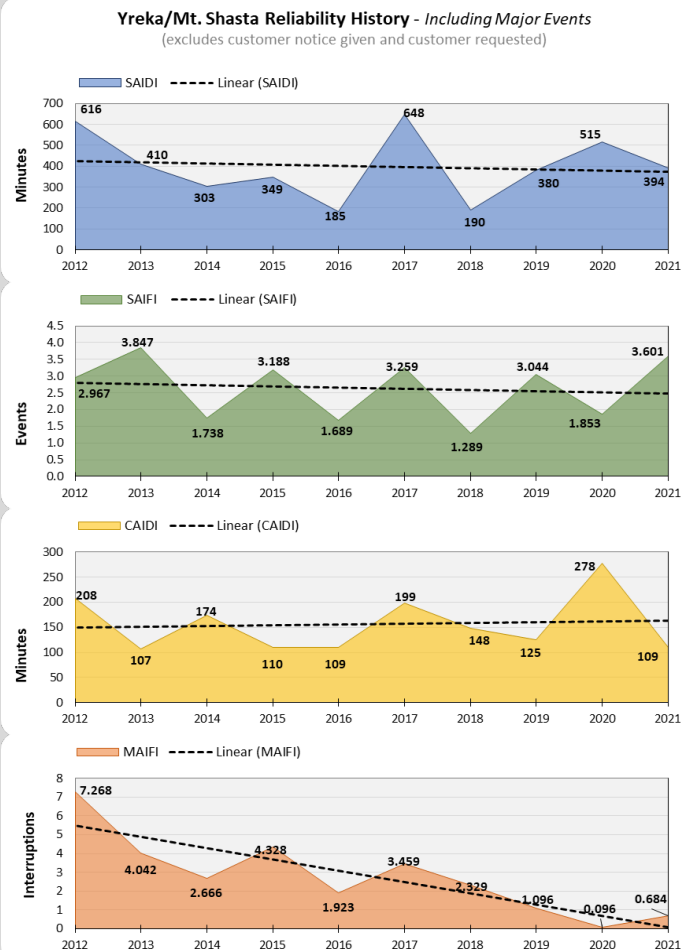
### Excluding Major Events



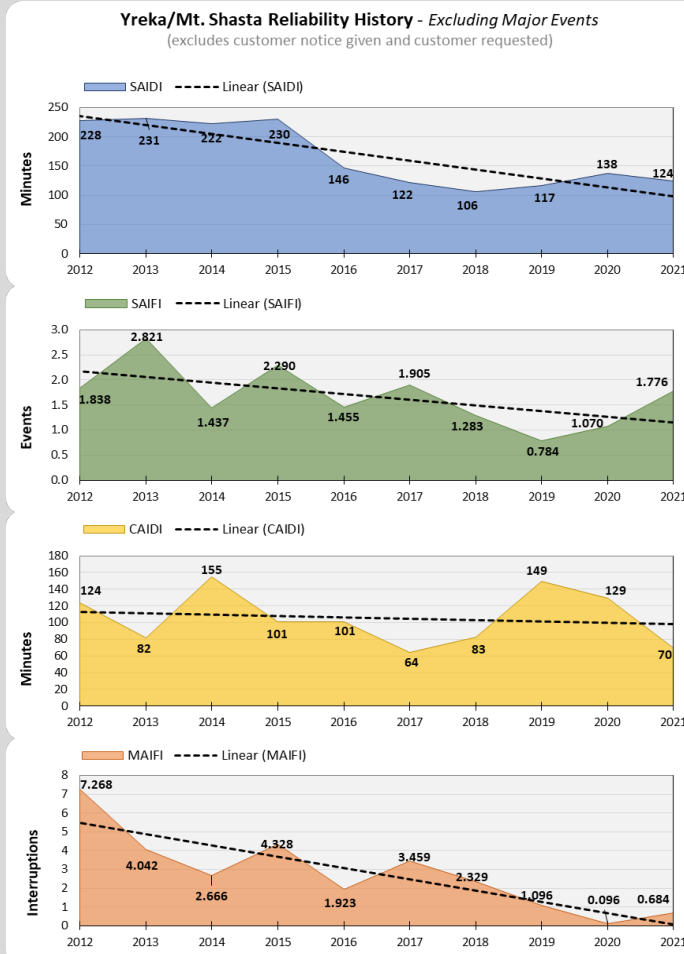
# 10 Year Yreka/Mt. Shasta Reliability Results

## Combined - Transmission and Distribution

### Including Major Events



### Excluding Major Events

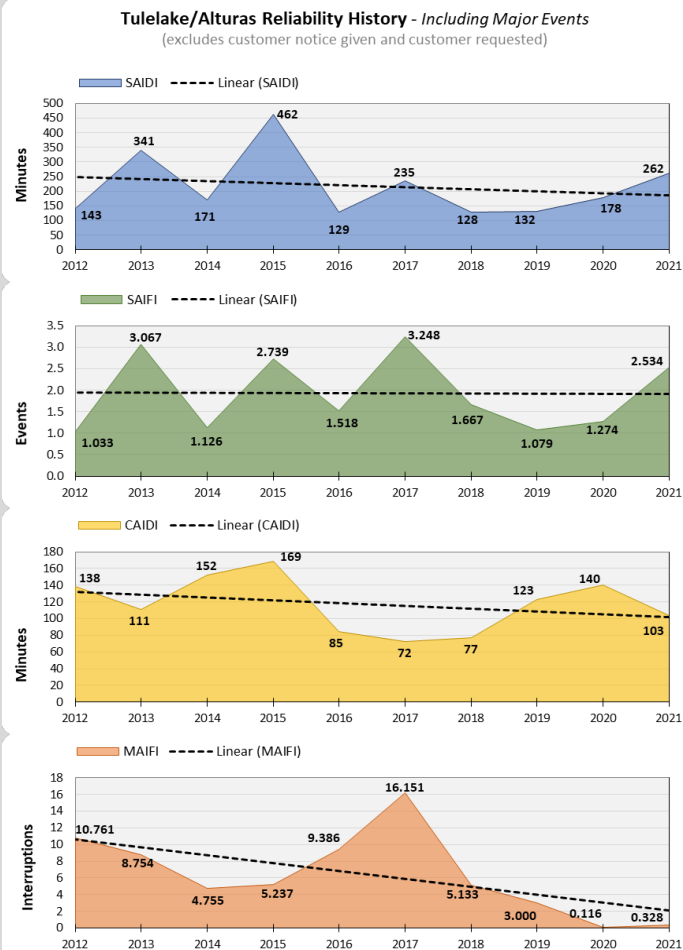




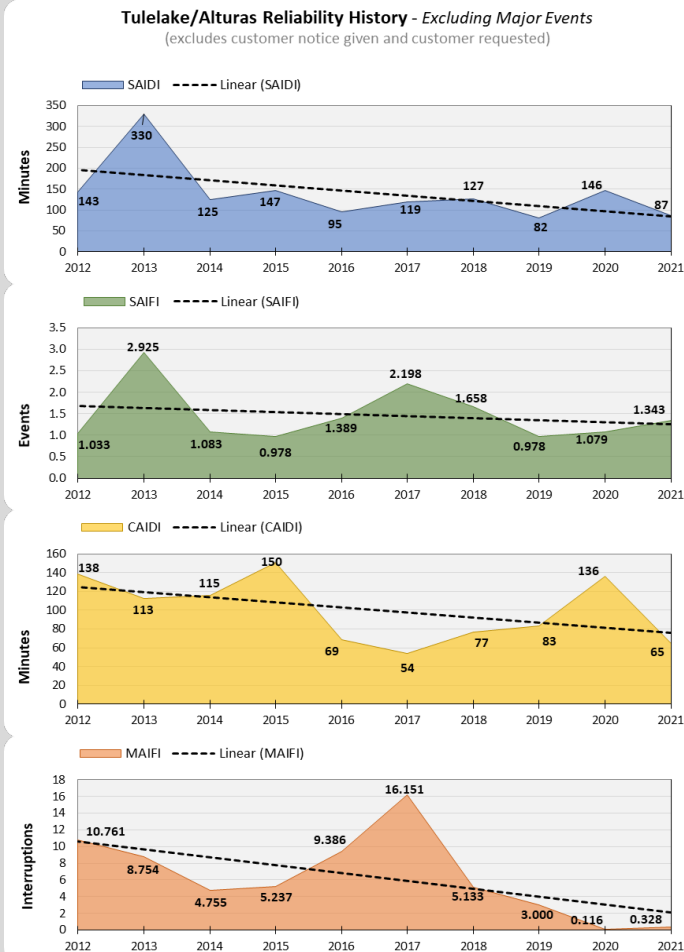
# 10 Year Tulelake/Alturas Reliability Results

## Combined - Transmission and Distribution

### Including Major Events



### Excluding Major Events



# Summary

- The company has made cost effective improvements in order to deliver higher reliability while minimizing cost impacts to customers
- We have shown demonstrated improvements as measured by industry indices
- We intend to continue to improve the service reliability you receive
- We welcome the opportunity to talk with customers about reliability
- Thank you for your attention!

# Website Information

- Information on reliability and annual reports
  - <https://www.pacificpower.net/outages-safety/reliability/california-reliability-report.html>
- Real-time outage viewer and other outage information
  - <https://www.pacificpower.net/outages-safety.html>
- Contact us at
  - <https://csapps.pacificpower.net/public/about/contact-us>