



Annual Electric Reliability Report 2023

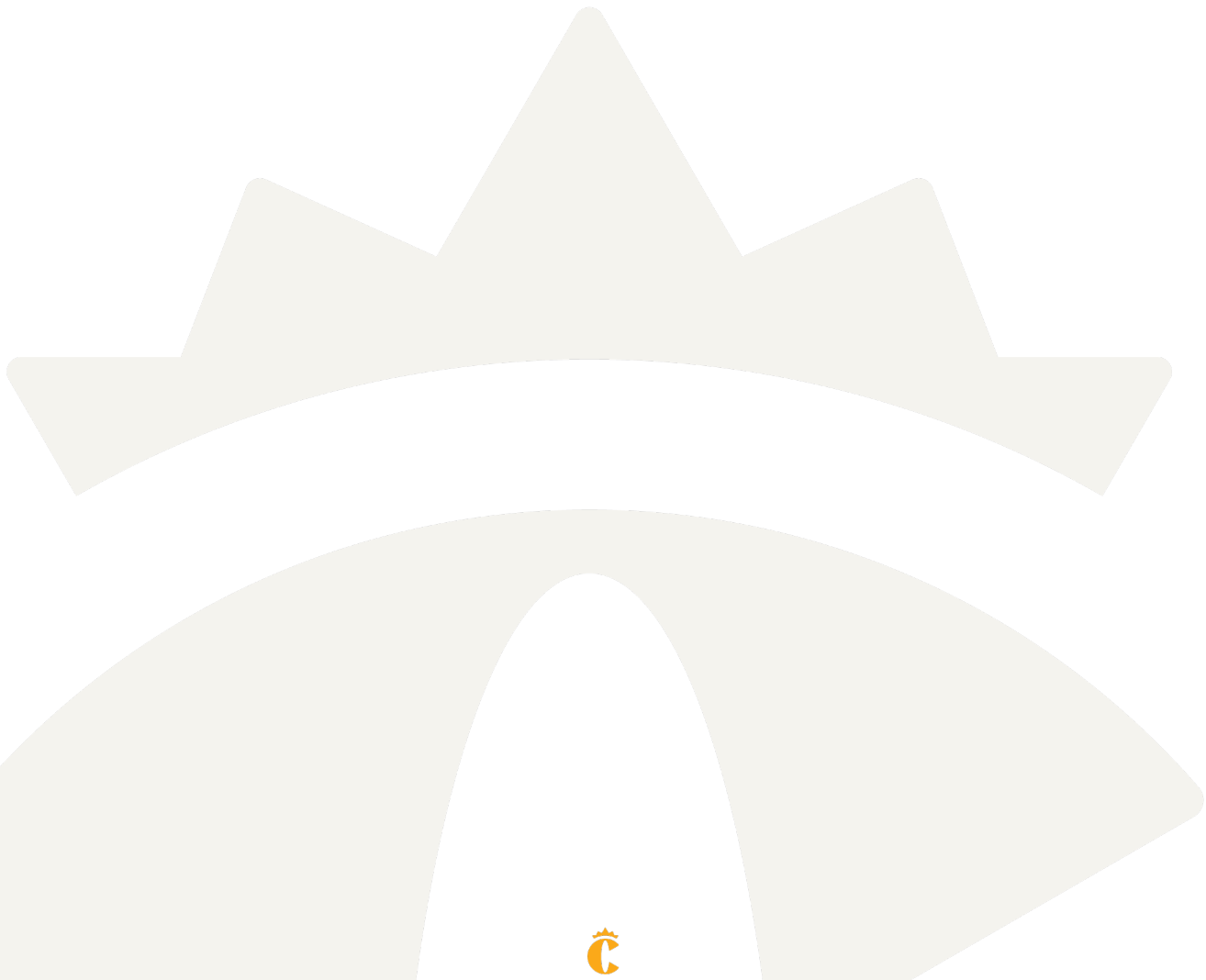
(Prepared: Aug 2024)

Corona Utilities Department



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Definitions

Sustained Interruption Event

- Outage lasting longer than 5 minutes as defined in the Institute of Electrical and Electronics Engineers (IEEE) std. 1366 2003.

Momentary Interruption Event

- Outage lasting 5 minutes or less as defined in IEEE std. 1366 2003. The event includes all momentary interruptions occurring within 5 minutes of the first interruption. For example, when an interrupting device operates two, three, or four times and then holds, it is considered a single event.

SAIDI - System Average Interruption Duration Index

- The amount of time on average a customer was without power in a year due to sustained interruptions (measured in minutes per customer).
- = Outage duration multiplied by the customers affected for all **sustained interruptions**
Total number of customers served

SAIFI - System Average Interruption Frequency Index

- The number of times an average customer was without power in a year due to service interruptions lasting more than 5 minutes (measured in interruptions per customer).
- = The number of customers which had **sustained interruptions**
Total number of customers served

CAIDI - Customer Average Interruption Duration Index

- The average time required to restore service for a sustained outage.
- = Outage duration multiplied by the customers affected for all **sustained interruptions**
Total number of customers which had **sustained interruptions**

MAIFI - Momentary Average Interruption Event Frequency Index

- The number of times an average customer was without power in a year due to service interruptions lasting 5 minutes or less (measured in interruptions per customer).
- = The number of customers which had **momentary interruption events**
Total number of customers served
- MAIFI can be calculated by one of two methods. Using the number of momentary interruptions or the number of momentary events. This report calculates MAIFI_E using momentary events. The event includes all momentary interruptions occurring within 5 minutes of the first interruption. For example, when an automatic interrupting device opens and then recloses two, or three times before it remains closed, it is considered a single event.



Introduction

The City of Corona Utilities Department (CUD) strives to provide reliable, uninterrupted service to our bundled Electric Utility customers. The following report details the work accomplished in 2023 in support of this goal. This report also provides data detailing the reliability of CUD's system as measured by standard industry metrics such as the System Average Interruption Duration Index (SAIDI), the System Average Interruption Frequency Index (SAIFI), the Customer Average Interruption Duration Index (CAIDI), and the Momentary Average Interruption Event Frequency Index (MAIFI).

In 2023, CUD interruptions were below the national average by 31% as measured by SAIDI and below the national average by 48% as measured by CAIDI. CUD's system average interruption frequency (SAIFI) was 33% above the national average. Comparison for MAIFI is not available, as it is not measured nationally.

These metrics tell us that in 2023, the average outage for CUD was 31% shorter than the national average and customer power was restored 48% times faster than the national average. The frequency of these outages in 2023 was 33% higher than the national average.

CUD will continue to strive to provide the most reliable service to our customers by conducting regular preventative maintenance services to our equipment, and by replacing equipment as it reaches its useful life.

Equipment Maintenance and Replacement

In 2023, there were two major improvement projects completed: (1) A Pad-Mounted Transformer (PMT) was installed at the Dos Lagos shopping center location to replace aging equipment, and (2) the Sunkist WRF#2 location was upgraded with an electric recloser to protect the power station in that area.

During the course of the year, the City of Corona Utilities Department completed 217 inspections of electrical assets throughout the city's boundaries. This amounted to 80% of the planned inspections for the year.



Above images: Pad-mounted equipment in the City of Corona's service area.



Reliability Overview

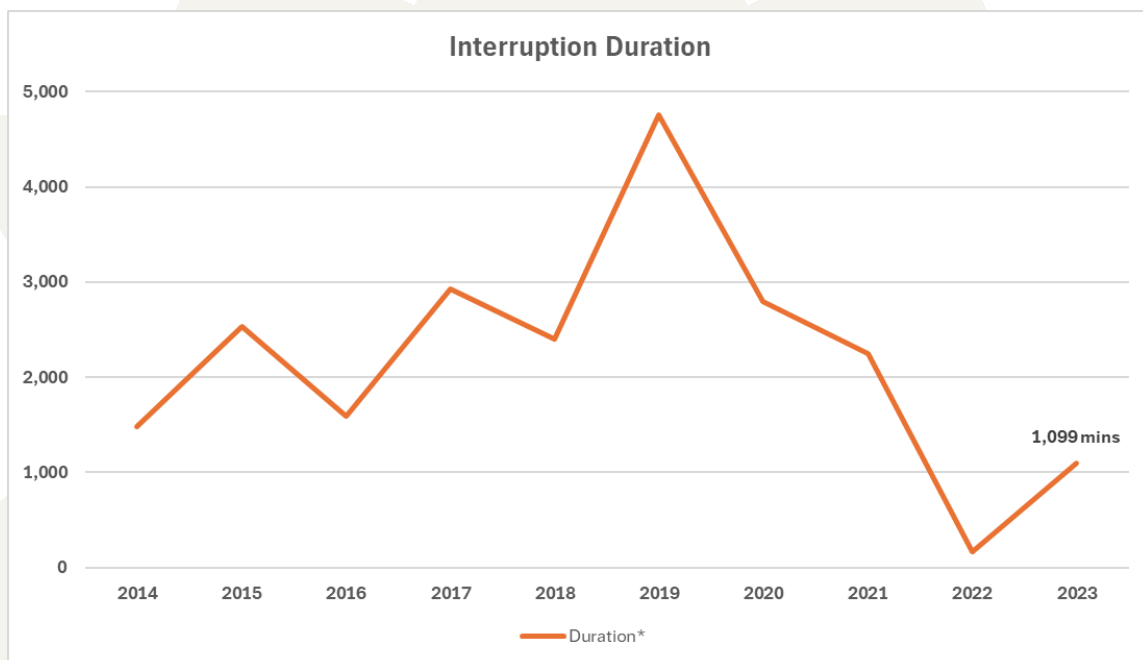
The Annual Interruption Report measures the performance of the electrical distribution system. This report provides a measure of CUD's system reliability for years 2014 through 2023.

CUD provides electric service for over 1,800 Customers via five separate Points of Interconnection (POC). This includes the Crossings, Dos Lagos, Corona Pointe, Sunkist/Princeland, and Clearwater interconnections, each having its separate and respective Wholesale Distribution Access Tariff (WDAT) agreement with SCE.

From 2022 to 2023 the total number of customers decreased by 0.2%.

ANNUAL SUMMARY (2014-2023)			
Year	#Int (ea)	Duration*	CMI**
2014	8	1,482	63,465
2015	16	2,532	604,514
2016	7	1,593	382,064
2017	23	2,925	2,108,742
2018	23	2,402	900,538
2019	21	4,755	3,524,568
2020	15	2,794	2,041,671
2021	21	2,246	641,678
2022	10	172	910,740
2023	6	1,099	423,321

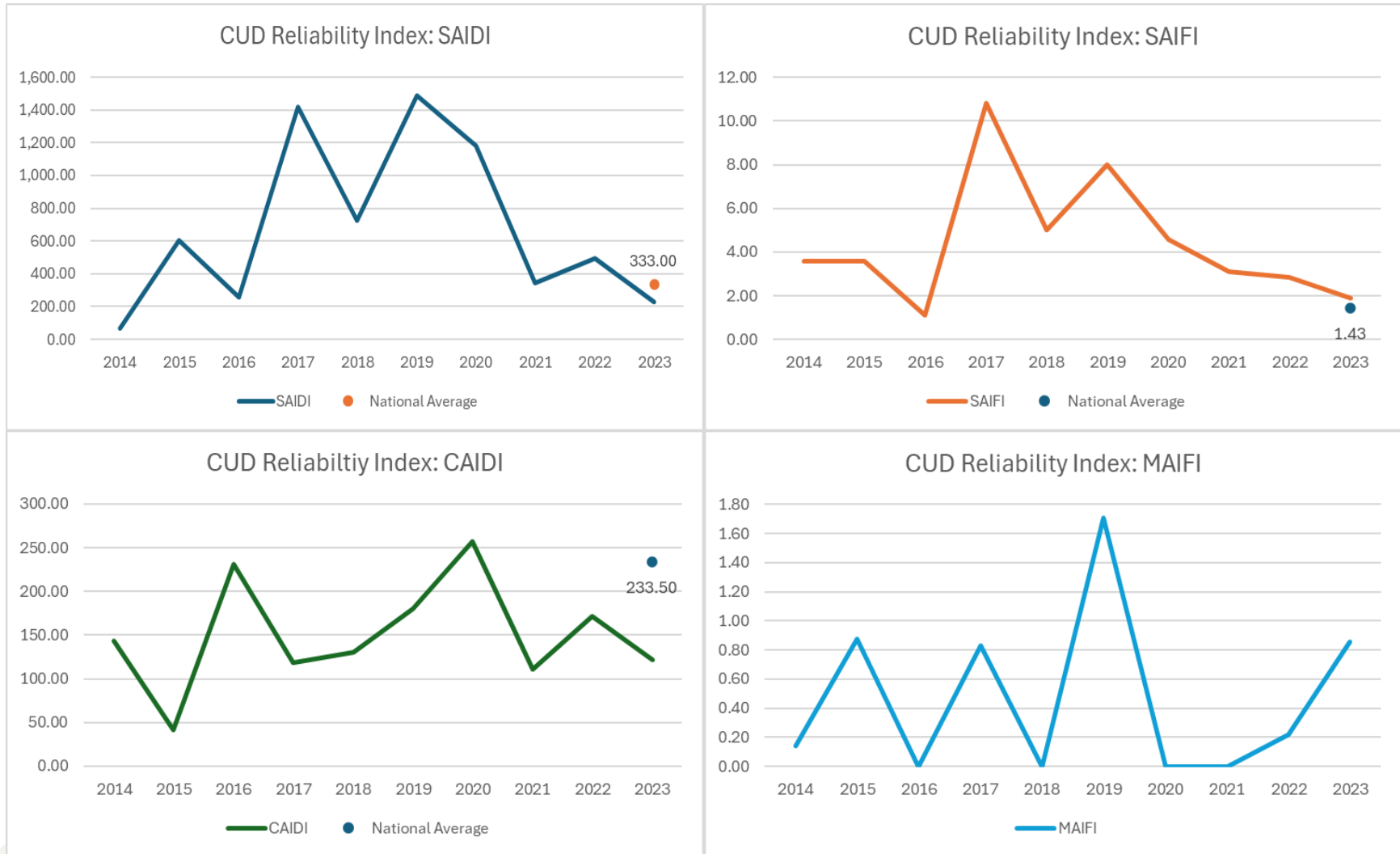
*Minutes
**Customer Minutes of Interruption



Reliability Indices

CUD 2014 - 2023 Annual Reliability Indices				
Yr / Month	SAIDI	SAIFI	CAIDI	MAIFI
2014	66.19	3.56	143.07	0.14
2015	601.51	3.56	41.37	0.87
2016	255.11	1.10	231.40	0.00
2017	1,418.30	10.81	118.41	0.83
2018	725.52	5.03	129.80	0.00
2019	1,485.60	7.99	180.69	1.71
2020	1,181.00	4.60	257.55	0.00
2021	340.90	3.12	111.25	0.00
2022	492.03	2.86	172.00	0.22
2023	229.19	1.89	121.23	0.86
National Average	333.00	1.43	233.50	
2023 Comparison to National Average	-31%	33%	-48%	

Reliability Indices Graph



Message from the Electric Utility Manager: Looking Ahead

Our goal at the City of Corona Utilities Department (CUD) is to provide reliable, uninterrupted service to our valued customers. Our annual preventive maintenance program ensures all equipment is thoroughly inspected to identify potential risks. Equipment is planned for replacement as it reaches its useful life, to avoid any unnecessary interruptions. Spare equipment is kept on hand to allow for rapid deployment in the event of an outage. Our promise is to do all we can to avoid unnecessary outages, and to turn power back on as quickly as possible when an emergency outage does occur.

In 2023, we are proud to say that CUD's average outage was 31% shorter than the national average and customer power was restored 48% times faster than the national average. However, CUD's frequency of outages was 33% higher than the national average. We strive to improve in each category when at all possible. Our goal is not to be better than the national average, but to be as reliable as possible.

In the next 1 to 5 years, CUD plans to replace 3 of our 7 capacitor banks. Capacitor banks enhance the functionality of our electrical distribution system by reducing line losses and improving system efficiency. Capacitor banks allow the system to provide more "real power" to customers. In the Sunkist/Princeland area, two 700 kVa transformers are planned for replacement. In the Dos Lagos area, we will be working to upgrade or replace cabling and elbows as needed. CUD is also working on an evaluation of our electric meters to potentially upgrade infrastructure and meters systemwide.

Thank you for the opportunity to serve you and thank you for your continued support as we work toward providing the best service possible.



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