

ELECTRIC SYSTEM RELIABILITY ANNUAL REPORT

2021

LIBERTY UTILITIES (CALPECO ELECTRIC) LLC (U 933 E)

-- PUBLIC VERSION --

Prepared for California Public Utilities Commission

July 15th, 2022

EXECUTIVE SUMMARY

The Electric System Reliability Annual Report for 2021 has been prepared in response to CPUC Decision 16-01-008, which was approved January 20, 2016. Decision 16-01-008 established reliability recording, calculation, and reporting requirements for Liberty Utilities (CalPeco Electric) LLC.

CalPeco Electric does not provide transmission services. CalPeco Electric does not have an Open Access Transmission Tariff (OATT). Therefore, data is presented for the distribution services only. All statistics and calculations include forced distribution outages. Forced outages are those that are not prearranged. For the purposes of this report, sustained outages are outages that lasted more than five minutes in duration, while momentary outages are outages that lasted five minutes or less in duration.

The reliability indicators that are tracked are as follows:

- 1. SAIDI (System Average Interruption Duration Index) minutes of sustained outages per customer per year.
- 2. SAIFI (System Average Interruption Frequency Index) number of sustained outages per customer per year.
- 3. MAIFI (Momentary Average Interruption Frequency Index) number of momentary outages per customer per year.
- 4. CAIDI (Customer Average Interruption Duration Index) is the average time required to restore service to a utility customer.

CalPeco Electric presents ten years (2012 through 2021) of data, which represents the period in which Liberty Utilities purchased CalPeco Electric from NV Energy.

Beginning in 2013, the measurement of each reliability performance indicator excludes IEEE Major Event Days (MED) instead of CPUC Major Events. An IEEE Major Event Day is defined in IEEE-1366, Section 4.5 as a day in which the daily system SAIDI exceeds a threshold value. These threshold major event days are referred to as "TMED". Thus, any day in which the total system SAIDI exceeds TMED is excluded from CalPeco Electric's reliability results. The applicable TMED value is calculated at the end of each year using CalPeco Electric's daily SAIDI values for the prior five years. CalPeco Electric's TMED value for 2021 was 176.44 minutes of daily system SAIDI. Other reliability indices in this report are not calculated using methodologies or formulas exactly as described in the IEEE guide for electric power Distribution Reliability indices (IEEE-1366).

Table of Contents System Indices for the Last 10 Years1 1) 2) Division (or District) Reliability Indices for the past 10 years......10 3) System and Division indices based on IEEE 1366 for the past 10 years including planned outages and including and excluding TMED10 4) 5) Top 10 major unplanned power outage events within a reporting year......24 6) 7) Summary list of 2021 TMED per IEEE 1366......25 8) Historical 10 largest unplanned outage events for the past 10 years.......26 9) Number of customer inquiries on reliability data and the number of days per response......31 10)

1) System Indices for the Last 10 Years (Years CalPeco Electric in business)

- a. Separate tables with SAIDI, SAIFI, MAIFI and CAIDI (Major Event Day (MED)) included and excluded.
 - I. Distribution System Indices (Major Event included and excluded)

Liberty Utilities (CalPeco Electric), LLC

<u>Distribution</u> Historical System Reliability Data 10 Years (Years in Business)

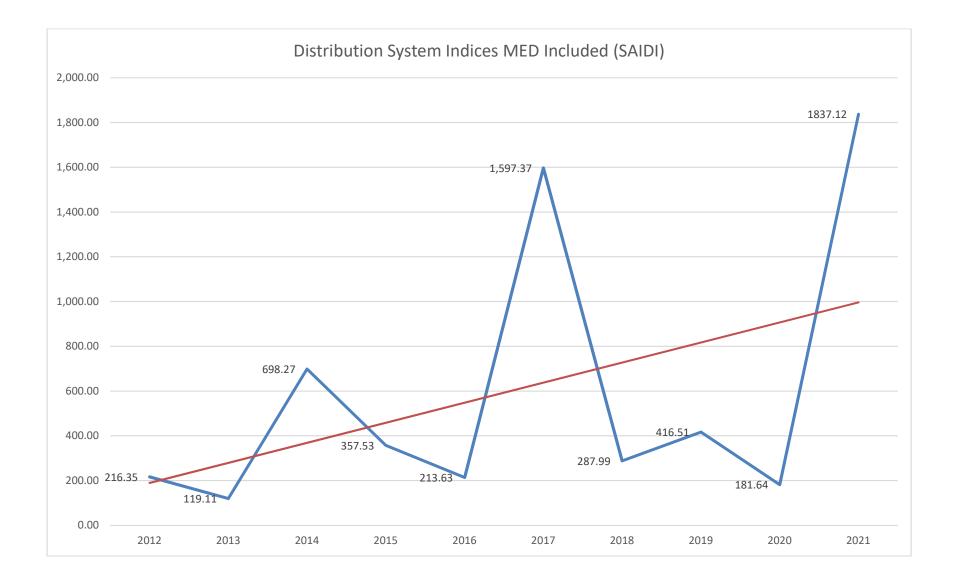
	<u></u>							
	Major Event Included							
Year	SAIDI	SAIFI	CAIDI	MAIFI				
2021	1837.12	5.36	342.74	0.548				
2020	181.64	1.57	115.23	0.313				
2019	416.51	2.96	140.73	0.31				
2018	287.99	2.18	131.82	0.52				
2017	1597.37	3.97	402.06	1.37				
2016	213.63	1.47	144.98	1.08				
2015	357.53	2.01	177.68	1.15				
2014	698.27	3.63	192.44	2.15				
2013	119.11	1.23	96.75	2.08				
2012	216.35	1.55	139.31	2.75				

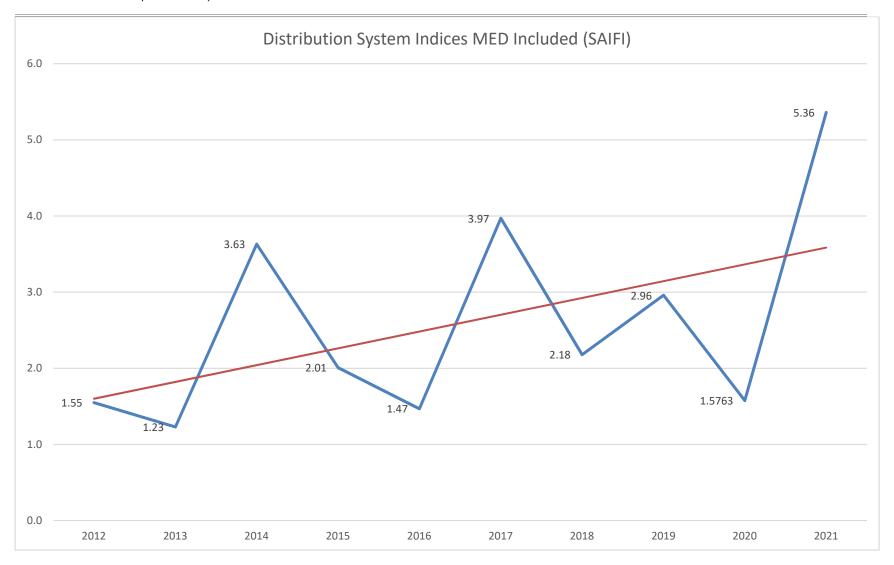
	Major Eve	Major Event Excluded									
SAIDI	SAIFI	CAIDI	MAIFI								
916.28	4.60	199.19	0.548								
181.64	1.57	115.23	0.313								
416.51	2.96	140.73	0.31								
287.99	2.18	131.82	0.52								
772.83	2.86	270.23	1.37								
213.63	1.47	144.98	1.08								
357.53	2.01	177.68	1.15								
352.37	2.4	146.58	2.15								
119.11	1.23	96.79	2.08								
216.35	1.55	139.31	2.75								

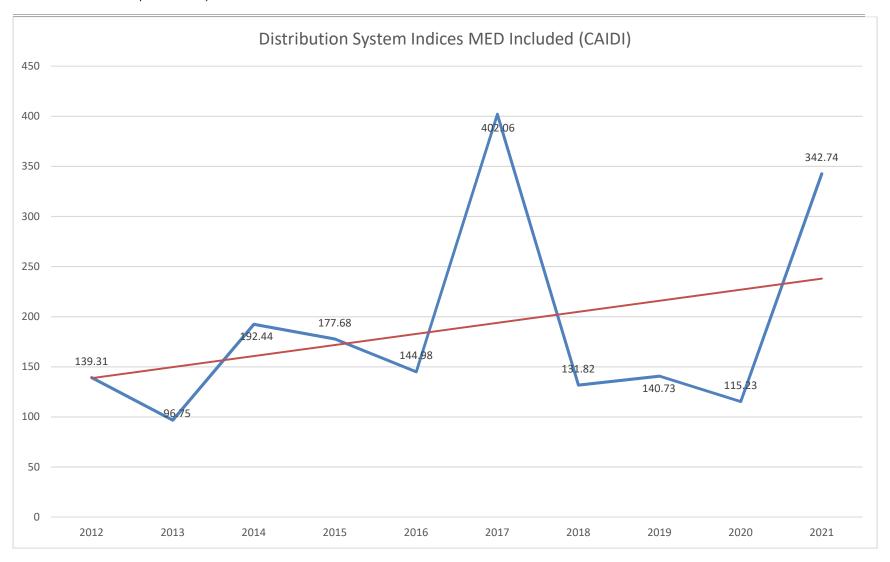
II. Transmission System Indices (MED Included and Excluded)

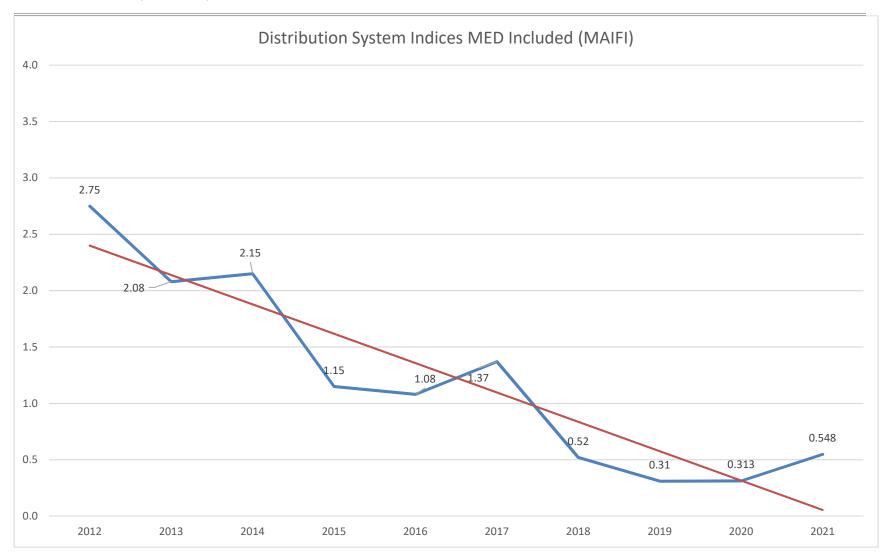
Liberty Utilities (CalPeco Electric), LLC does not own Transmission.

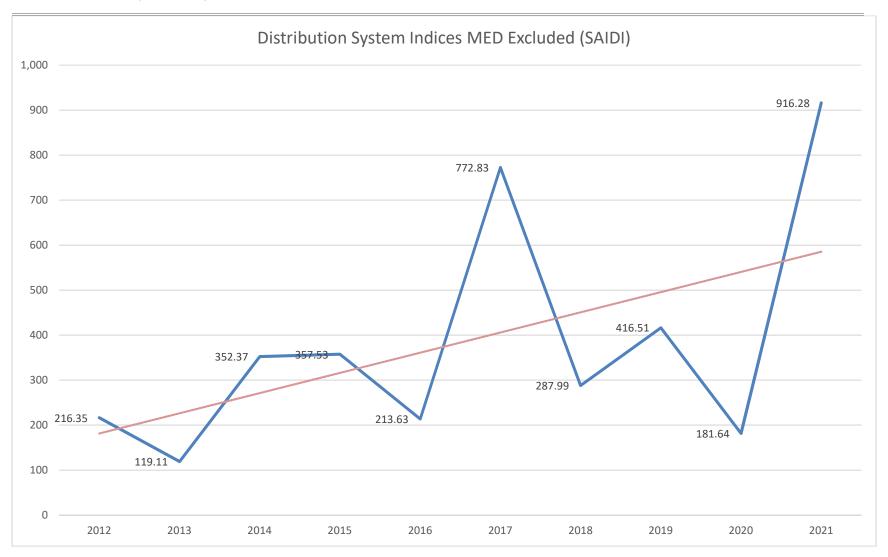
b. Separate charts showing a line graph of distribution system SAIDI, SAIFI, MAIFI, and CAIDI for the past 10 years with linear trend line (TMED included and excluded).

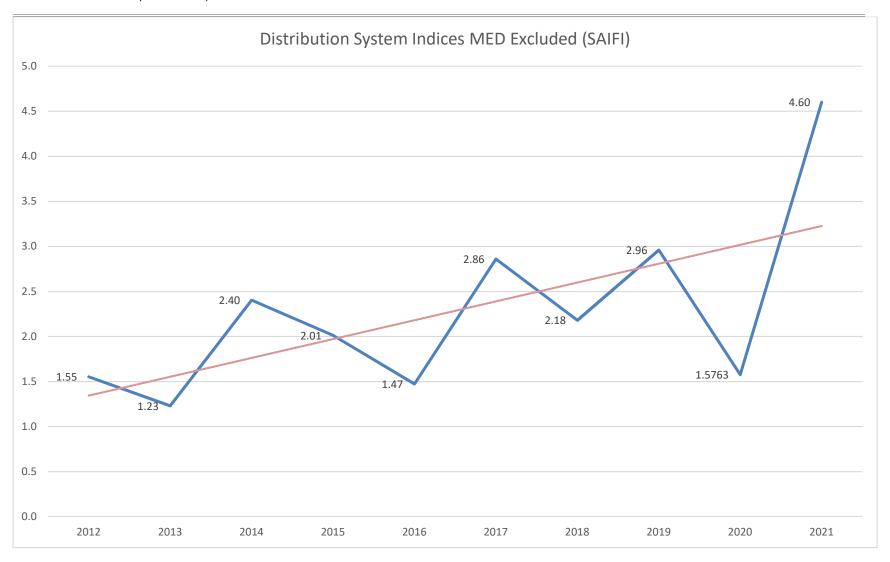


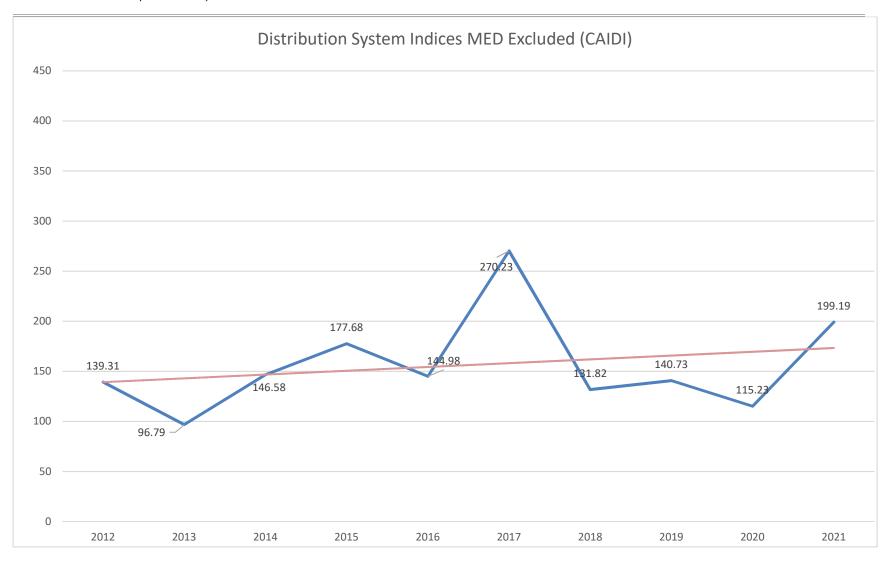


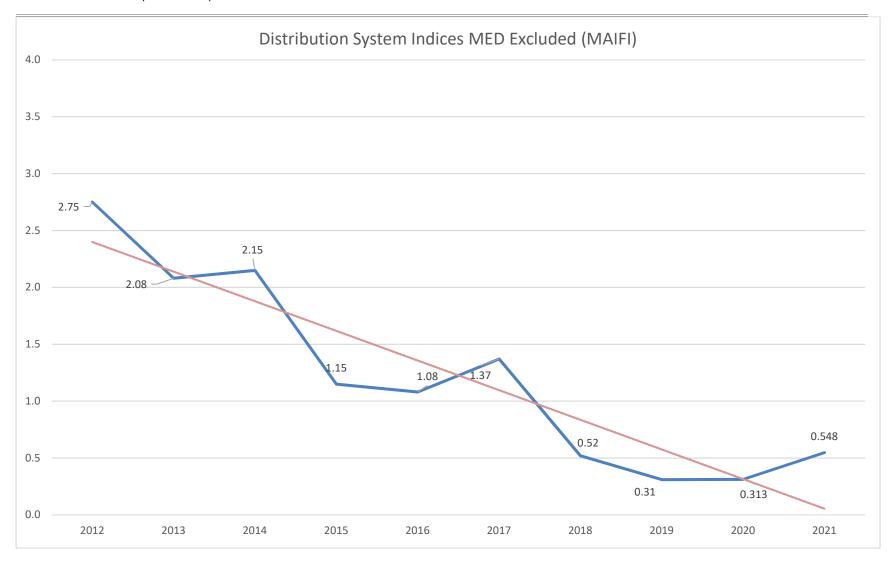












2) Division (or District) Reliability Indices for the past 10 years

Liberty Utilities (CalPeco Electric), LLC has one division, Lake Tahoe. See section 1 for indices.

3) System and Division indices based on IEEE 1366 for the past 10 years including planned outages and including and excluding MED

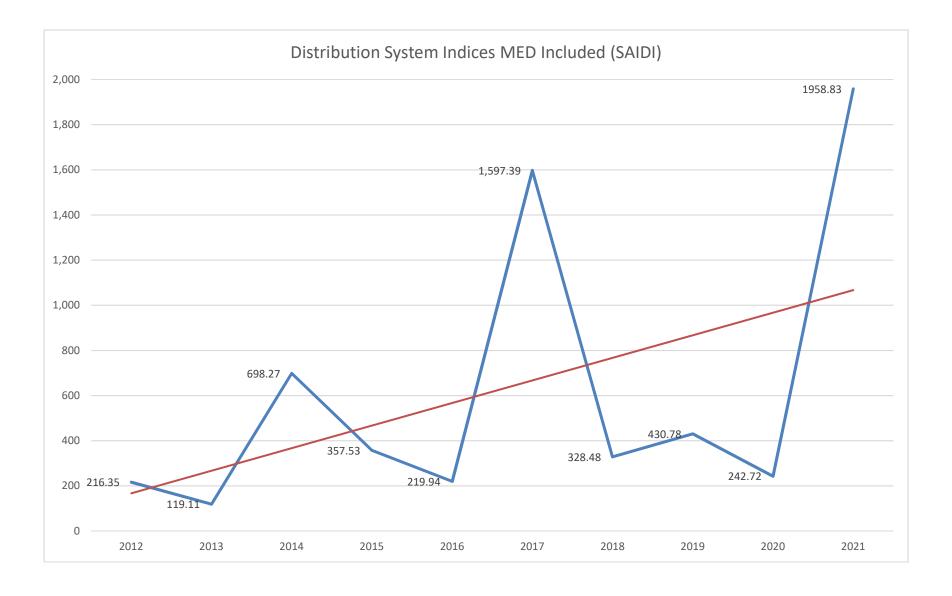
a. SAIDI, SAIFI, MAIFI, and CAIDI Data

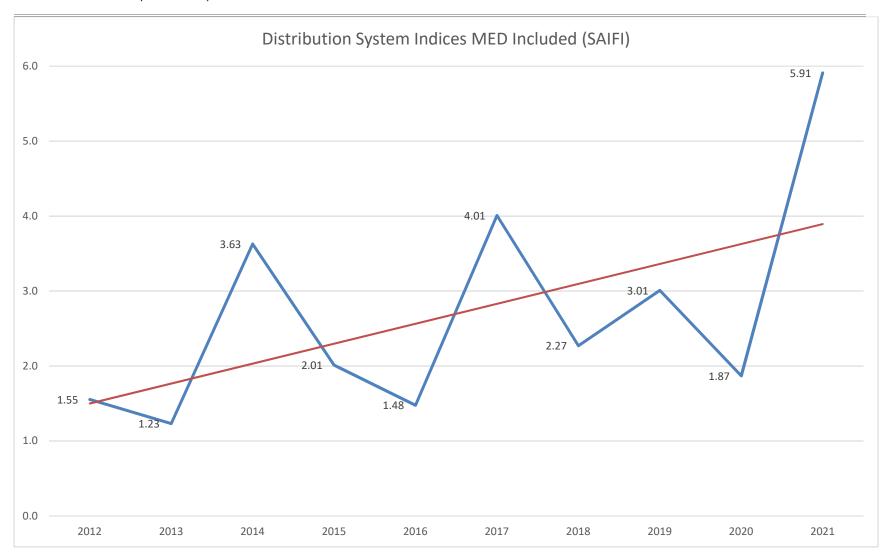
Liberty Utilities (CalPeco Electric), LLC

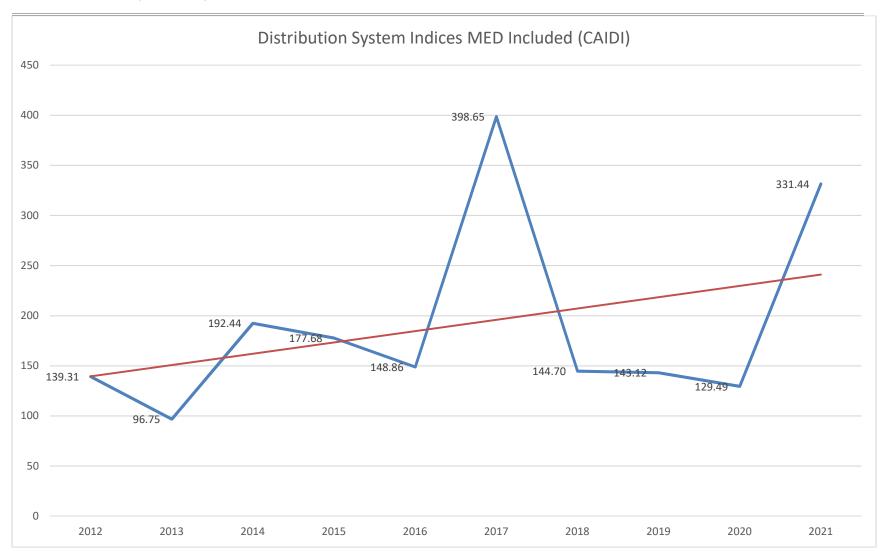
<u>Distribution</u> Historical System Reliability Data 10 Years (Years in Business)

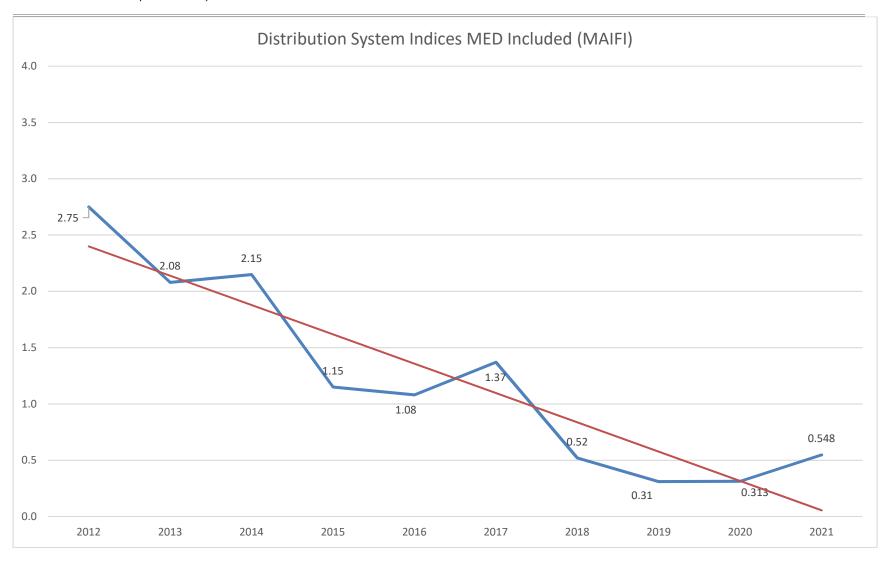
	TMED Included							
Year	SAIDI	SAIFI	CAIDI	MAIFI				
2021	1958.83	5.91	331.44	0.548				
2020	242.72	1.87	129.49	0.313				
2019	430.78	3.01	143.12	0.31				
2018	328.48	2.27	144.7	0.52				
2017	1597.39	4.01	398.65	1.37				
2016	219.94	1.48	148.86	1.08				
2015	357.53	2.01	177.68	1.15				
2014	698.27	3.63	192.44	2.15				
2013	119.11	1.23	96.75	2.08				
2012	216.35	1.55	139.31	2.75				

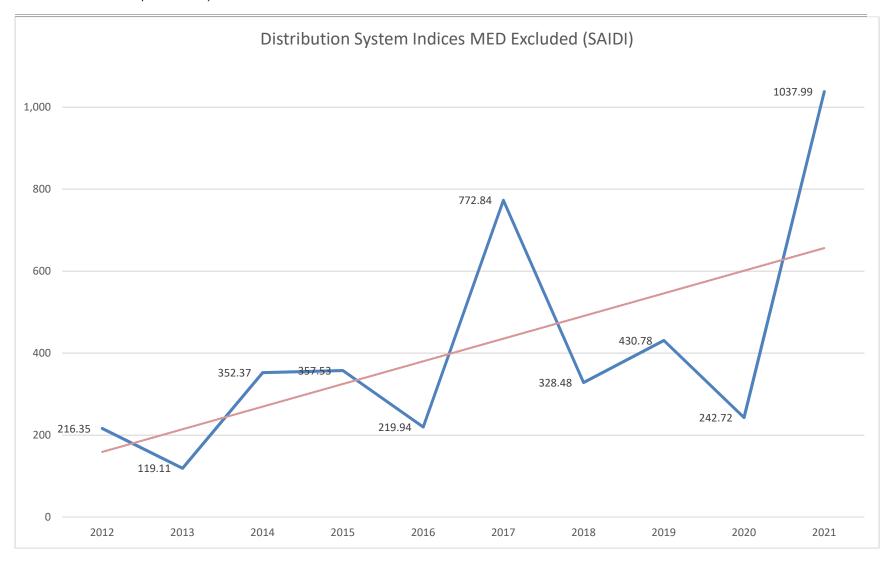
TMED Excluded								
SAIDI	SAIFI	CAIDI	MAIFI					
1037.99	5.14	201.94	0.548					
242.72	1.87	129.49	0.313					
430.78	3.01	143.12	0.31					
328.48	2.27	144.7	0.52					
772.84	2.89	267.42	1.37					
219.94	1.48	148.86	1.08					
357.53	2.01	177.68	1.15					
352.37	2.4	146.58	2.15					
119.11	1.23	96.79	2.08					
216.35	1.55	139.31	2.75					

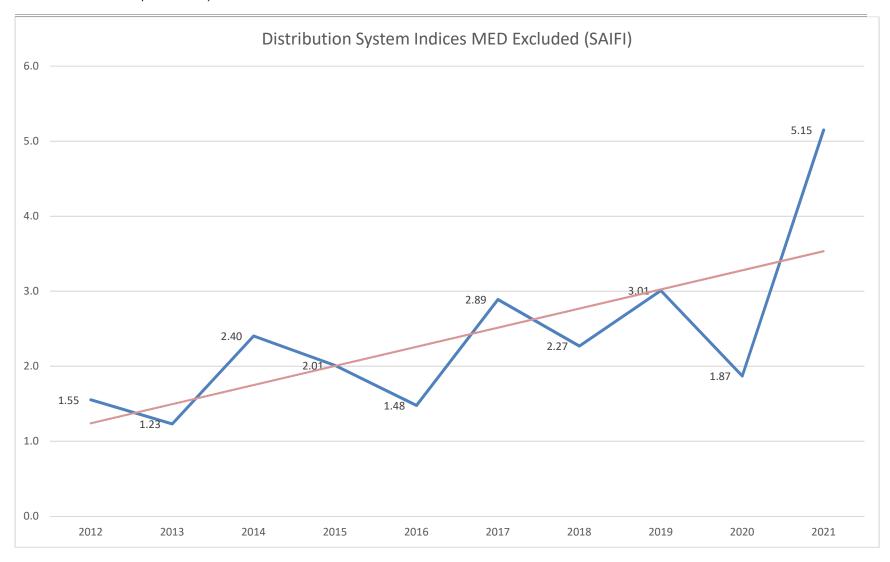


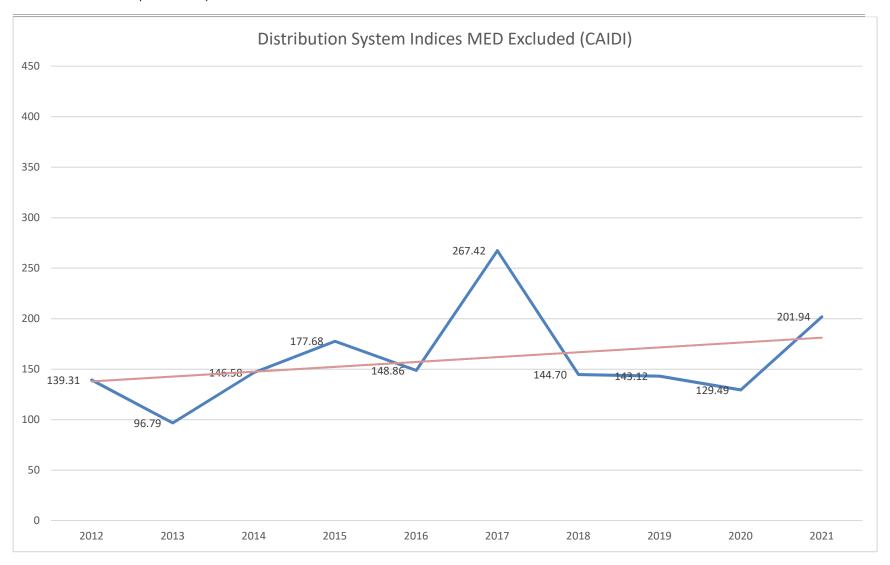


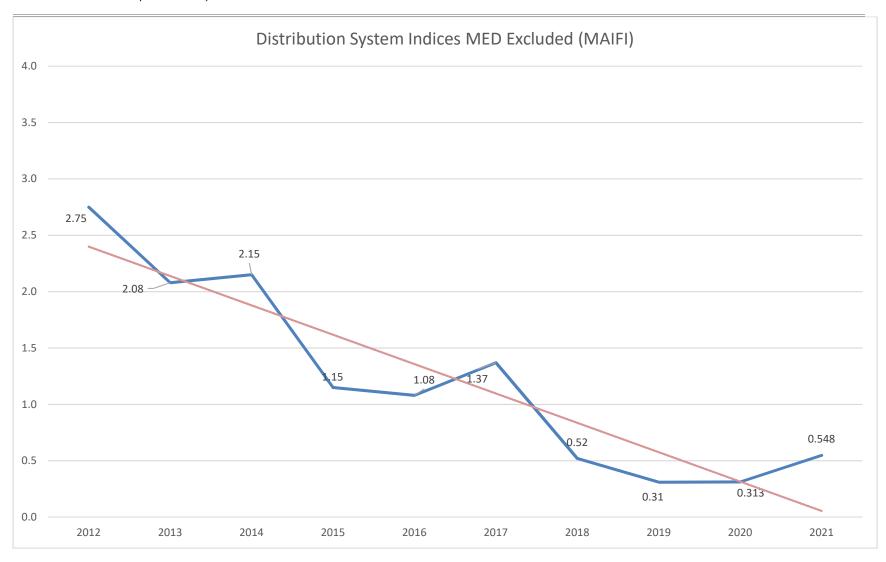








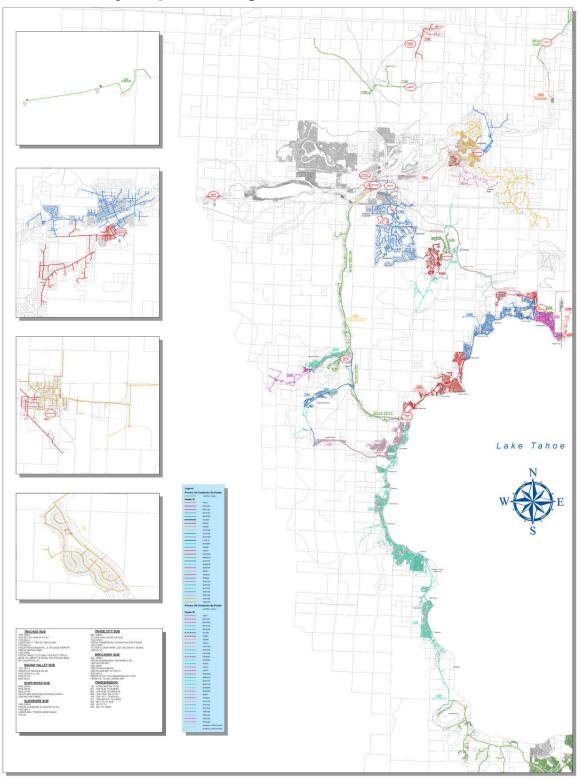




				Nun	nber of	Planne	d Outa	ges By	Year		
Circuit	District	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012
31	Tahoe	5	3		1			1			
32	Tahoe	17	4	1		2	1				
41	Tahoe		6				1				
201	Tahoe	3			7					1	
204	Tahoe	1		2			1				
619	Tahoe										1
650	Tahoe							1			1
1261	Tahoe	5	7	1	1						
1296	Tahoe		2		1	2		5	1		
2200	Tahoe	1		1				1	1		
2300	Tahoe	2		1	1			1	2		1
3100	Tahoe	7	2	8	5	1					1
3101	Tahoe	5	3	3					2	2	
3200	Tahoe	22	1	3	5			1			1
3300	Tahoe	19	3	8	10	2		3			2
3400	Tahoe	23	1	2	4	3		5		2	4
3500	Tahoe	9	6	15		6		1			
3501	Tahoe	7		3	3			2	2	4	1
4201	Tahoe	3		1	1		1				
4202	Tahoe	8	2	5	3	4				2	5
5100	Tahoe	1	1							1	1
5200	Tahoe		1	5	4	1		4	1	1	3
5201	Tahoe	2		8	1	5	5	4	1		1
7100	Tahoe	4	4	1	2	1			1	1	4
7200	Tahoe			1	1			1	1	1	2
7201	Tahoe	4	1	1		4	1	2	1		
7202	Tahoe	1	3	3	1	1		2	3	1	
7203	Tahoe	2		3	2			2	2	4	
7300	Tahoe	14	8	20	14	5	6	4	16	4	5
7400	Tahoe	4	1	4	8	2	1	1			
7600	Tahoe			1	1			1			
7700	Tahoe		4						1		
7800	Tahoe								2		
7900	Tahoe		2	1							
8200	Tahoe	2	1	1	2	7	3	2	4		
8300	Tahoe		1	1	1	2		6			2
8400	Tahoe		1		7						
8500	Tahoe	1	2				1			1	2
8600	Tahoe							4			2

b. The number, date, and location of planned outages

4) Service territory map including divisions of districts



5) Top two worst performing circuits (WPC) excluding TMED

For each of these circuits each utility shall include the following information in its annual report: 1) Circuit Name; 2) District/Division; 3) Customer Count; 4) Substation name; 5) Circuit-miles; 6) Percentage underground, or "% UG"; 7) Percentage overhead or "% OH"; 8) Number of mainline/feeder/backbone outages resulting in the operation of either a circuit breaker ("CB") or automatic re-closer ("AR"); and, 9) its preferred reliability metric.

		Customs Substation		O'marait.	Facilities		Number of Mainline/	*0::4	Circuit
Circuit	District	r Count	Substation Name	Circuit Miles	ОН	UG	Feeder/Backbone Outages Per Year	*Circuit SAIDI	Circuit SAIFI
1261*	Tahoe	845	Topaz	56.98	75.6%	24.4%	3	3029	6.38
3300	Tahoe	3562	Meyers	56.95	90.7%	9.3%	2	980	1.88

Note: Preferred Metric is the average of circuit SAIDI over a 3 year period.

^{*} A circuit that has been identified as deficient in the previous year's report.

- II. Any circuit appearing on this list of "deficient" WPC circuits that also appeared on the previous year's list would be marked by an asterisk. For each asterisked circuit, each utility shall provide the following information:
 - I. An explanation of why it was ranked as a "deficient" circuit, i.e., the value of the metric used to indicate its performance;
 - II. A historical record of the metric;
 - III. An explanation of why it was on the deficiency list again;
 - IV. An explanation of what is being done to improve the circuit's future performance and the anticipated timeline for completing those activities (or an explanation why remediation is not being planned); and
 - V. A quantitative description of the utility's expectation for that circuit's future performance.

The Topaz 1261 circuit was noted as a deficient circuit in 2019, 2020, and 2021. The 3-year average circuit SAIDI score remains high due to an operations error causing an outage on March 22, 2019 which lasted approx. 58hrs, and a fire that occurred on November 17, 2020 causing widespread outages over the circuit that were restored over the course of 12 hours.

There were 14 unplanned outages in 2021 for the 1261 circuit, 4 were due to wildfire and loss of source, 5 were due to fuse operations, 2 were due to equipment operation from vegetation, 1 was due to device failure, and 2 were unknown causes.

The historical metric for Topaz 1261 based on a 3-year average:

- 2021 3028.6
- 2020 2,615.2
- 2019 3,040.6
- 2018 2,393.8
- 2017 3,004.5

There are currently no plans in place that would remedy loss of source outages, which account for majority of the outages experienced by customers on this circuit. The circuit is a radial line, sourced by an NV Energy substation in Nevada.

The circuit performance in 2021 measured alone was around average compared to historical values. The events in 2019 and 2020 were outliers

resulting from extreme weather conditions and do not accurately represent the average performance of the system.

- III. Language to explain how the IOUs' include a cost effectiveness review as part of their respective internal review processes for circuit remediation projects.
 - I. Definitions of terms, acronyms, limitations, and assumptions;

Definitions

WPC- Worst Performing Circuits

<u>Assumptions</u>

Our analysis excludes planned outages and TMED outages.

II. A clear explanation of the utility's process to determine the worst performing circuits:

The top 2 Worst Performing Circuits (WPC) are determined based upon the calculated average of circuit SAIDI over a 3 year period. This index is calculated on sustained outages by taking the total customer minutes of interruption and dividing by the number of customers on the circuit. Three years' worth of data is included and averaged in order to account for anomalies and tracking the impact of phased improvement projects.

III. A clear explanation of the utility's process to determine cost-effective remediation projects. This shall include why the utility may decide to implement a project to address one worst performing circuit issue while deciding to not implement a project to address a different worst performing circuit.

The Regional Engineer presents proposals for reliability improvement projects along with a circuit analysis, cost-benefit analysis, and details on customer impact to the Business Manager, Engineering Manager, and Vice President of Operations. Collectively, the group determines which projects to approve or suggest alternatives and further analysis.

6) Top 10 major unplanned power outage events within a reporting year

- a. The cause of each outage event; and
- b. The location of each outage event.

Rank	Outage Date	Cause	Location	Customer Impact	SAIDI	SAIFI
1	7/28/2021	CB Lockout	Lake Tahoe	10812	15.5224	0.2156
2	12/15/2021	Recloser Lockout	Lake Tahoe	5348	11.8368	0.1066
3	12/14/2021	Wire Down	Lake Tahoe	4530	33.3307	0.0903
4	7/29/2021	Lighting	Lake Tahoe	4522	5.3199	0.0902
5	12/14/2021	Device failure	Lake Tahoe	4387	50.1236	0.0875
6	10/7/2021	Loss of Source	Lake Tahoe	4374	0.5233	0.0872
7	10/8/2021	Loss of Source	Lake Tahoe	4374	30.2642	0.0872
8	12/24/2021	CB Lockout	Lake Tahoe	4368	0.0871	0.0871
9	12/13/2021	CB Lockout	Lake Tahoe	4362	35.5737	0.0870
10	2/25/2021	Loss of Source	Lake Tahoe	4183	3.0861	0.0834

^{*}Based on customer impact

7) Summary list of 2021 TMED per IEEE 1366

- a. The number of customers without service at periodic intervals for each TMED;
- b. The cause of each Major Event (ME); and
- c. The location of each ME.

Rank	Outage Date	Cause	Location	Customer Impact	SAIDI	SAIFI
1	7/16/2021	Fire	Lake Tahoe	1152	562.3210	0.0229
2	12/15/2021	Storm	Lake Tahoe	36881	338.6680	0.7354

TMED as of 2020 = 176.84

8) Historical 10 largest unplanned outage events for the past 9 years*

*Based on Customers Affected

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
1	CB Lockout	7/28/2021	10812	1.2	12,974	No
2	Recloser Lockout	12/15/2021	5348	1.85	9,894	No
3	Wire Down	12/14/2021	4530	6.15	27,860	Yes
4	Lighting	7/29/2021	4522	0.98	4,447	No
5	Device failure	12/14/2021	4387	9.55	41,896	Yes
6	Loss of Source	10/7/2021	4374	0.1	437	No
7	Loss of Source	10/8/2021	4374	5.78	25,296	No
8	CB Lockout	12/24/2021	4368	1.7	7,426	No
9	CB Lockout	12/13/2021	4362	6.82	29,734	No
10	Loss of Source	2/25/2021	4183	0.62	336	No

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
1	Operations Error	7/28/2020	5,291	0.68	3597.8	No
2	CB Lockout, Lightning possible	8/24/2020	3,835	1.63	6251.05	No
3	Unknown	11/6/2020	3,728	1.3	4846.4	No
4	Wind/Debris	8/12/2020	3,724	0.56	2085.44	No
5	Animal	9/10/2020	3,451	0.3	1035.3	No
6	Animal	9/6/2020	3,266	0.86	2808.7	No

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
7	Animal	10/23/2020	3,266	0.28	914.5	No
8	Animal	7/28/2020	2,555	0.46	705.8	No
9	Device failure	7/2/2020	2,555	1.43	3653.6	No
10	Operations Error	7/28/2020	2,555	0.68	1737.4	No

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
1	Third Party - Contractor Dig In	10/1/2019	10,490	3.88	40701.2	No
2	Equipment Failure	2/22/2019	8,560	4.42	37835.2	No
3	Third Party - Contractor Dig In	10/3/2019	7,841	0.18	1411.38	No
4	Hardware Failure	2/26/2019	4,485	3.5	15697.5	No
5	Tree	1/18/2019	4,448	1.76	7828.48	No
6	Hardware Failure	3/6/2019	4,448	0.82	3647.36	No
7	Animal	11/11/2019	4,245	0.6	2547	No
8	Third Party – Line Contact	9/21/2019	3,712	0.43	1596.16	No
9	Animal	6/7/2019	3,529	0.47	1658.63	No
10	Tree	6/7/2019	3,507	1.51	5295.57	No

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
1	Third Party - Switching	5/17/2018	17,315	2.51	91301.9	No
2	Loss of Source – External System	12/12/2018	7,552	0.1	755.2	No
3	Trees	10/17/2018	7,398	6.32	14218.8	No
4	Loss of Source – External System	12/12/2018	7,089	0.1	708.9	No
5	Hardware Failure	10/3/2018	4,678	3.61	6958.1	No
6	Trees - Major Storm	6/9/2018	4,485	9.38	6420.1	No
7	Unknown	11/12/2018	4,154	1.76	7338.7	No
8	Unknown	1/4/2018	3,529	0.2	705.8	No
9	Loss of Source – External System	12/12/2018	3,434	0.1	343.4	No
10	Loss of Source – External System	8/4/2018	2,721	2.96	8072.3	No

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
1	Loss of Source – External System	1/10/17	22,000	26.12	5,745,66.7	No
2	Loss of Source – External System	8/28/2017	8,643	1.15	9,939.5	No
3	Major Storm	1/8/2017	4,497	9.75	43,845.8	No
4	Major Storm	2/8/2017	4,497	2.58	11,617.3	No
5	Trees	4/7/2017	4,497	1.91	8,619.3	No
6	Trees/Major Storm	2/22/2017	4,105	1.68	6,910.1	No
7	Major Storm	1/5/2017	3,517	8.72	30,656.5	No
8	Major Storm	2/21/2017	3,517	0.4	1,406.8	No
9	Underground Fault	5/30/2017	3,486	2.82	9,818.9	No
10	Carp/Pole	6/6/2017	3,486	1.97	6,855.8	No

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers- hours affected	CPUC Major Event?
1	Loss of Source – External System	3/13/2016	6,882	0.75	5,046.80	No
2	Wind/Trees	10/16/2016	4,125	1.75	7,150.00	No
3	Underground Fault	10/4/2016	4,125	4.31	17,793.30	No
4	Downed Wire	3/22/2016	4,125	1.70	6,294.80	No
5	Car/Pole	3/13/2016	3,517	1.00	3,957.90	No
6	Failed Overhead Hardware/Material	1/1/2016	3,500	5.50	7,250.00	No
7	Trees	3/1/2016	3,258	0.50	1,683.30	No
8	Underground Fault	6/29/2016	2,859	8.42	3,975.10	No
9	Primary Contact – 3 rd Party	8/23/2016	2,772	5.15	2,693.25	No
10	Trees	6/15/2016	2,732	8.15	3,822.70	No

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers- hours affected	CPUC Major Event?
1	Storm	4/25/2015	4,120	6.50	12,380.00	No
2	Underground Fault	2/14/2015	3,587	0.50	2,511.00	No
3	Downed Wire	12/11/2015	3,587	10.00	17,251.00	No
4	Trees	2/6/2015	3,548	0.50	1,360.00	No
5	Bird/Animal	5/24/2015	3,000	6.50	12,340.00	No
6	Fire	2/20/2015	3,000	0.50	1,650.00	No
7	Weather/Lightning	7/4/2015	3,000	2.00	5,600.00	No
8	Weather/Lightning	7/7/2015	3,000	0.25	1,000.00	No
9	Operations	8/11/2015	3,000	0.25	750.00	No
10	Weather/Lightning	8/7/2015	3,000	1.75	5,400.00	No

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers- hours affected	CPUC Major Event?
1	NV Energy Outage	9/27/2014	27,046	4.27	115,396.27	Yes
2	Flashing	7/20/2014	26,000	5.12	2,690.45	Yes
3	Tree-Green	12/11/2014	15,853	4.03	63,940.43	No
4	Relay Failure	9/23/2014	8,900	0.22	1,928.33	No
5	Trees	3/11/2014	3,587	1.83	6,521.17	No
6	Weather/Lightning	7/20/2014	3,587	0.75	2,690.25	No
7	Trees	8/30/2014	3,587	0.30	1,195.67	No
8	Trees	1/30/2014	3,548	4.25	2,109.00	No
9	Bird/Animal	8/31/2014	3,548	0.50	1,774.00	No
10	Trees	7/20/2014	3,500	5.00	17,266.67	No

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers- hours affected	CPUC Major Event?
1	Wire Down Transformer	7/4/2013	5,650	9.82	10,816.02	No
2	Tree Trimming	8/14/2013	4,800	2.35	4,334.50	No
3	Car/Pole	10/25/2013	3,548	0.40	1,419.20	No
4	Cable Failure	8/7/2013	3,475	8.50	4,412.50	No
5	Trees	3/14/2013	3,315	0.30	1,049.75	No
6	Hardware Failure	3/6/2013	3,000	8.13	14,740.00	No
7	Weather/Lightning	7/2/2013	3,000	2.10	6,300.00	No
8	Weather/Lightning	7/25/2013	2,042	3.46	911.83	No
9	Bird/Animal	10/5/2013	2,000	4.00	2,108.00	No
10	Unknown Cause	6/30/2013	2,000	0.76	1,533.33	No

LIBERTY UTILITIES (CALPECO) LLC 2021 ELECTRIC SYSTEM RELIABILITY REPORT

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers- hours affected	CPUC Major Event?
1		8/19/2012	8,677	1.08	9,400.08	No
2	Overhead Hardware/Material	11/29/2012	4,200	.067	3,488.33	No
3	Trees	4/1/2012	4,120	12.70	37,471.67	No
4	Hardware Failure	4/13/2012	4,120	2.95	12,154.00	No
5	Trees	5/24/2012	4,120	0.73	3,021.33	No
6	Bird/Animal	6/28/2012	3,587	0.47	1,673.93	No
7	Weather/Lightning	7/23/2012	3,548	1.16	909.50	No
8	Car/Pole	7/16/2012	3,315	8.83	2,724.17	No
9	Bird/Animal	5/11/2012	3,201	2.48	7,949.15	No
10	Bird/Animal	6/25/2012	1,967	5.60	11,015.20	No

9) Number of customer inquiries on reliability data and the number of days per response

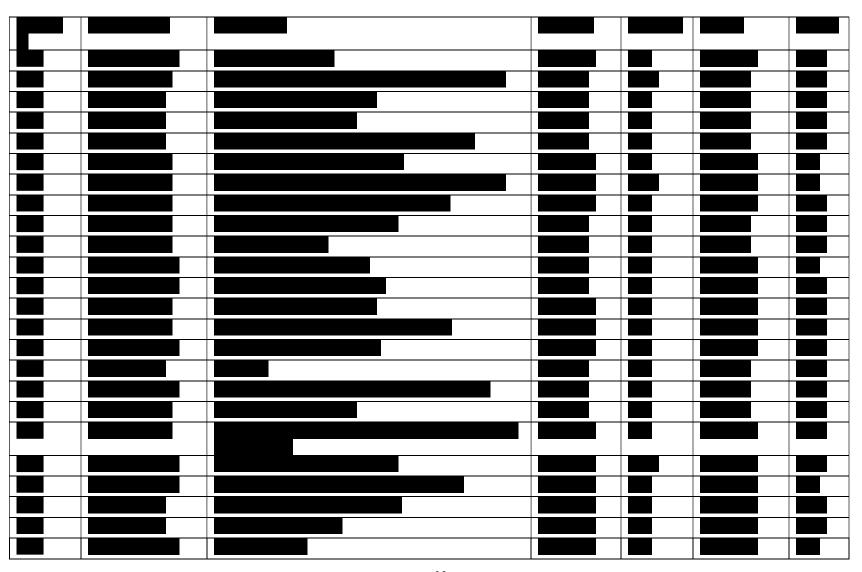
CalPeco Electric did not receive any reliability inquiries in 2021.

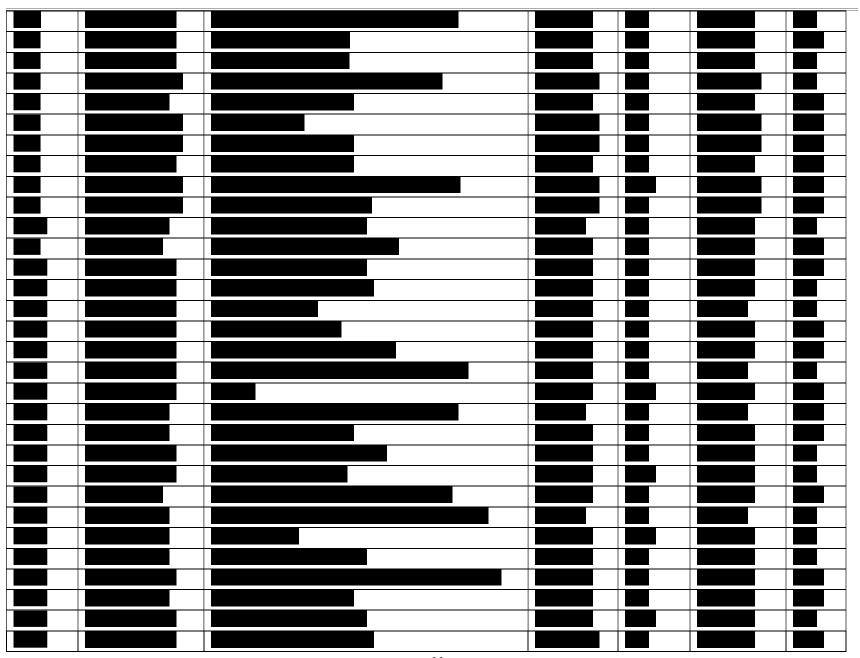
Date Received	Date Responded	Description of Inquiry

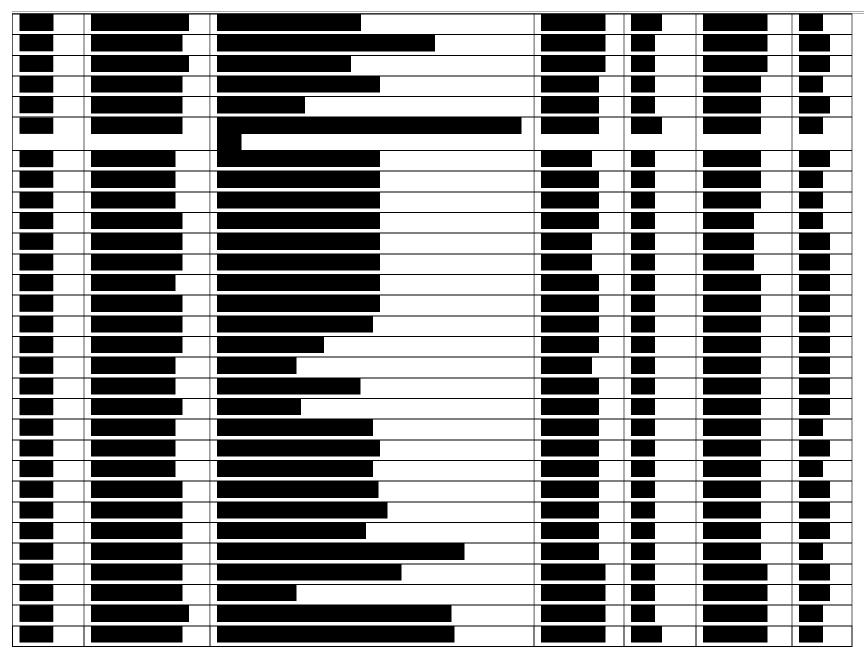
10) List of PSPS's in 2021

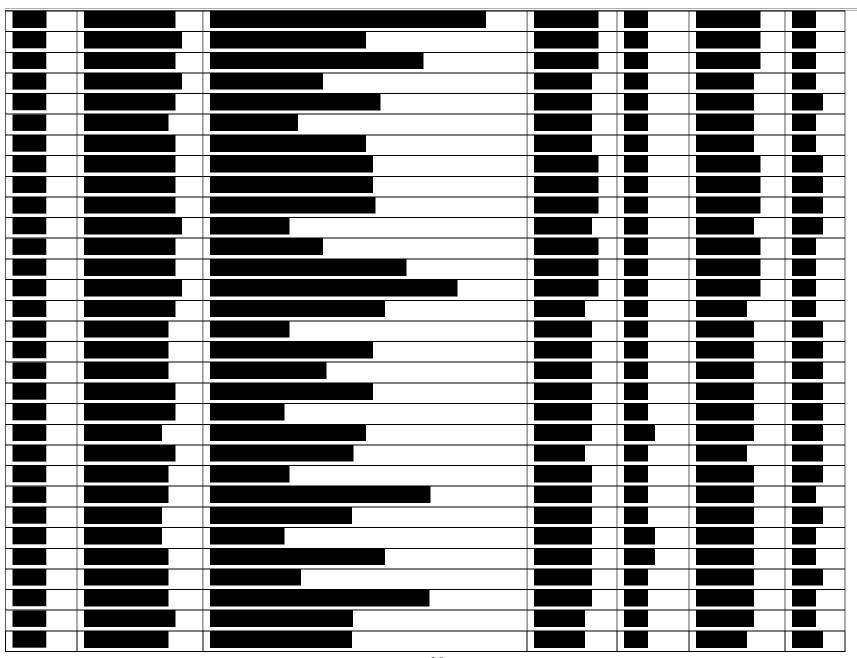
CalPeco Electric did not have any PSPS events in 2021.

Appendix A: 9 Years of Planned Outage Data -- PUBLIC VERSION --









LIBERTY UTILITIES (CALPECO) LLC 2021 ELECTRIC SYSTEM RELIABILITY REPORT





