



**Liberty Utilities®**

**ELECTRIC SYSTEM RELIABILITY  
ANNUAL REPORT**

**2018**

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

**-- PUBLIC VERSION --**

**Prepared for  
California Public Utilities Commission**

**July 15, 2019**

## EXECUTIVE SUMMARY

The Electric System Reliability Annual Report for 2018 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 eight years (2011 through 2018) 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 2018 was 198.88 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).

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**1) System Indices for the Last 8 Years (Years CalPeco Electric in business)**

a. Separate tables with SAIDI, SAIFI, MAIFI and CAIDI (Major Event Day (MED)) included and excluded.

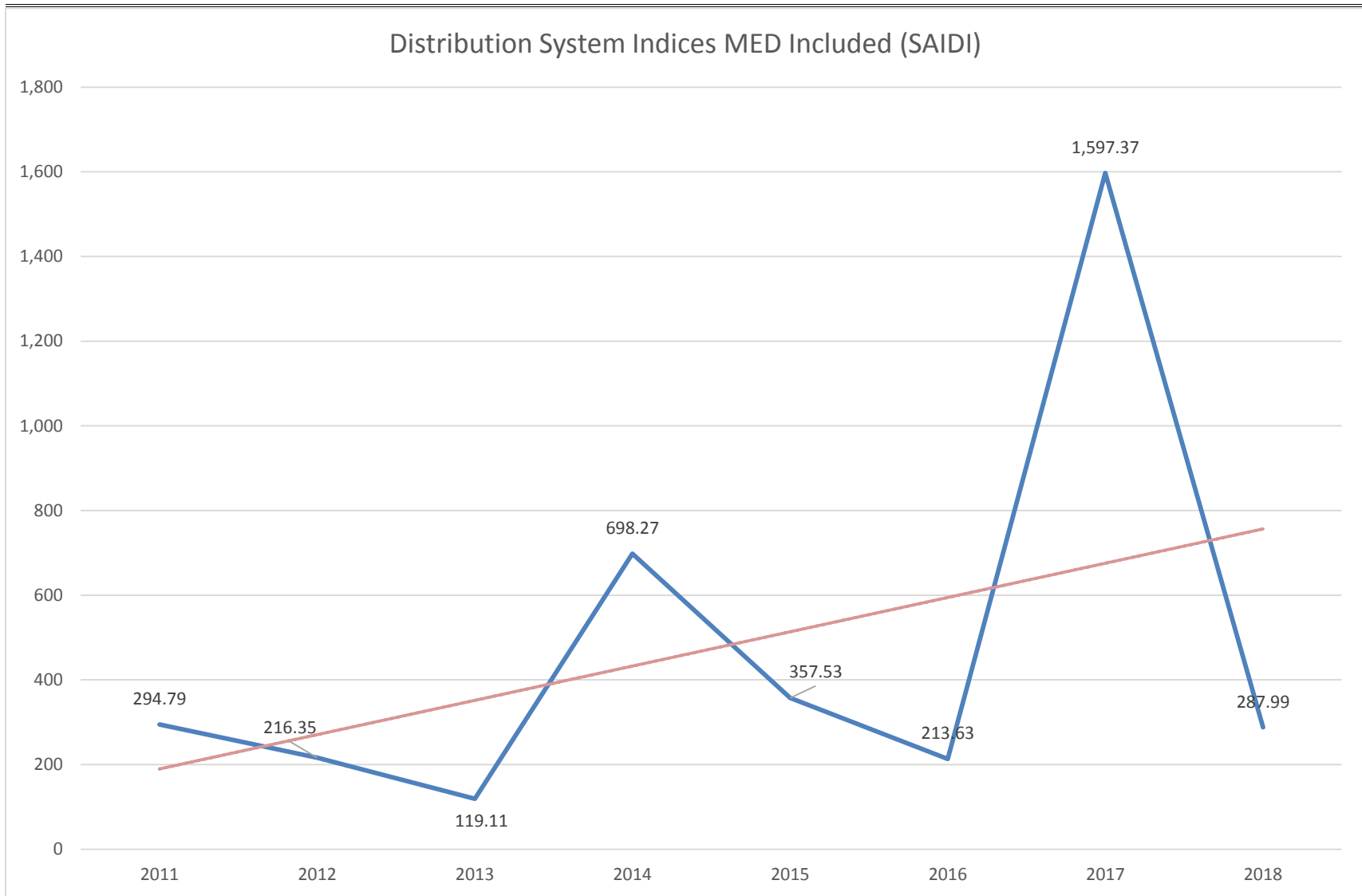
I. Distribution System Indices (Major Event included and excluded)

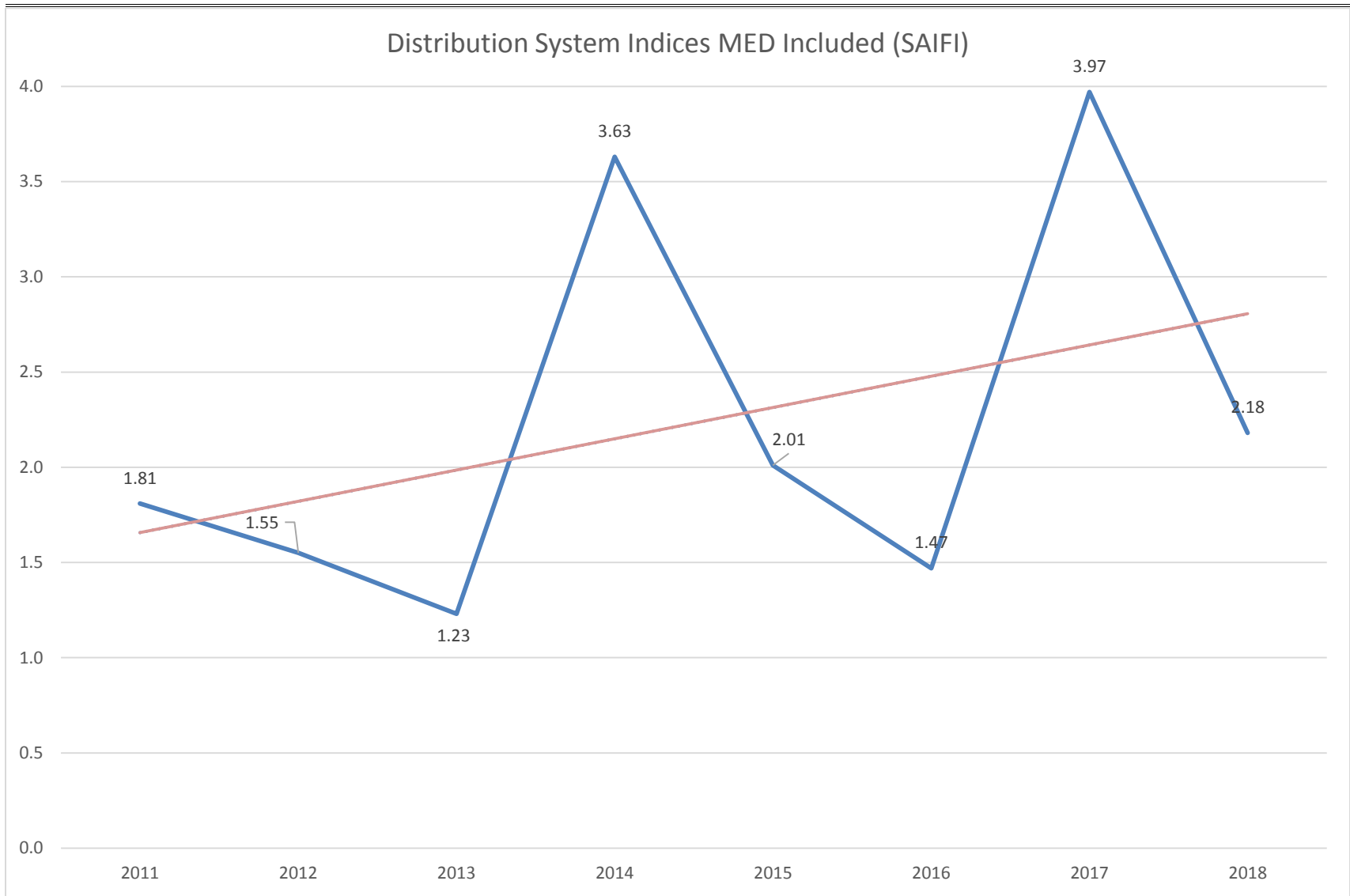
Liberty Utilities (CalPeco Electric), LLC Distribution Historical System Reliability Data 7 Years (Years in Business)								
Year	Major Event Included				Major Event Excluded			
	SAIDI	SAIFI	CAIDI	MAIFI	SAIDI	SAIFI	CAIDI	MAIFI
2018	287.99	2.18	131.82	0.52	287.99	2.18	131.82	0.52
2017	1597.37	3.97	402.06	1.37	772.83	2.86	270.23	1.37
2016	213.63	1.47	144.98	1.08	213.63	1.47	144.98	1.08
2015	357.53	2.01	177.68	1.15	357.53	2.01	177.68	1.15
2014	698.27	3.63	192.44	2.15	352.37	2.40	146.58	2.15
2013	119.11	1.23	96.75	2.08	119.11	1.23	96.79	2.08
2012	216.35	1.55	139.31	2.75	216.35	1.55	139.31	2.75
2011	294.79	1.81	162.60	1.88	192.22	1.25	154.27	1.88

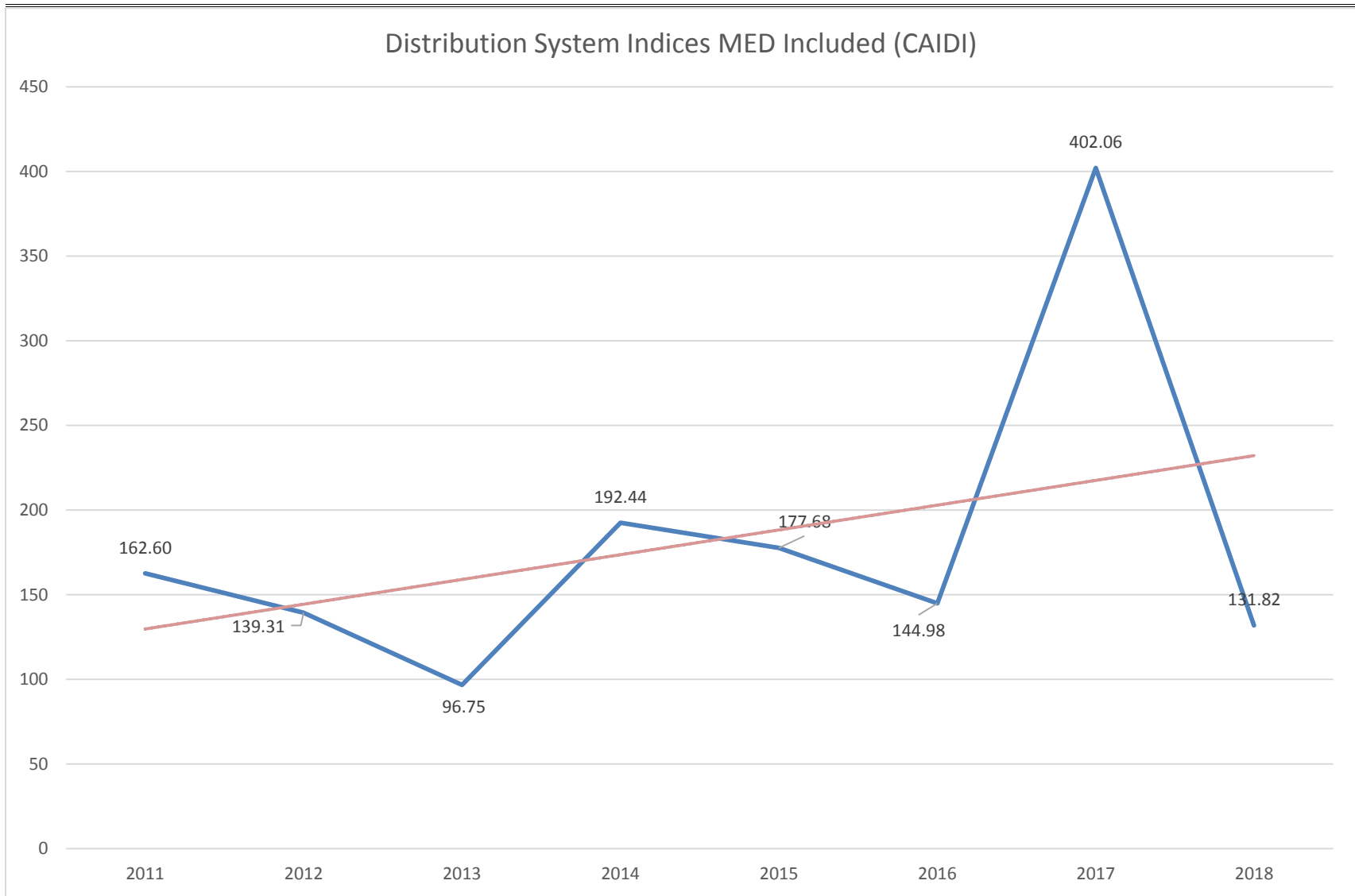
II. Transmission System Indices (MED Included and Excluded)

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

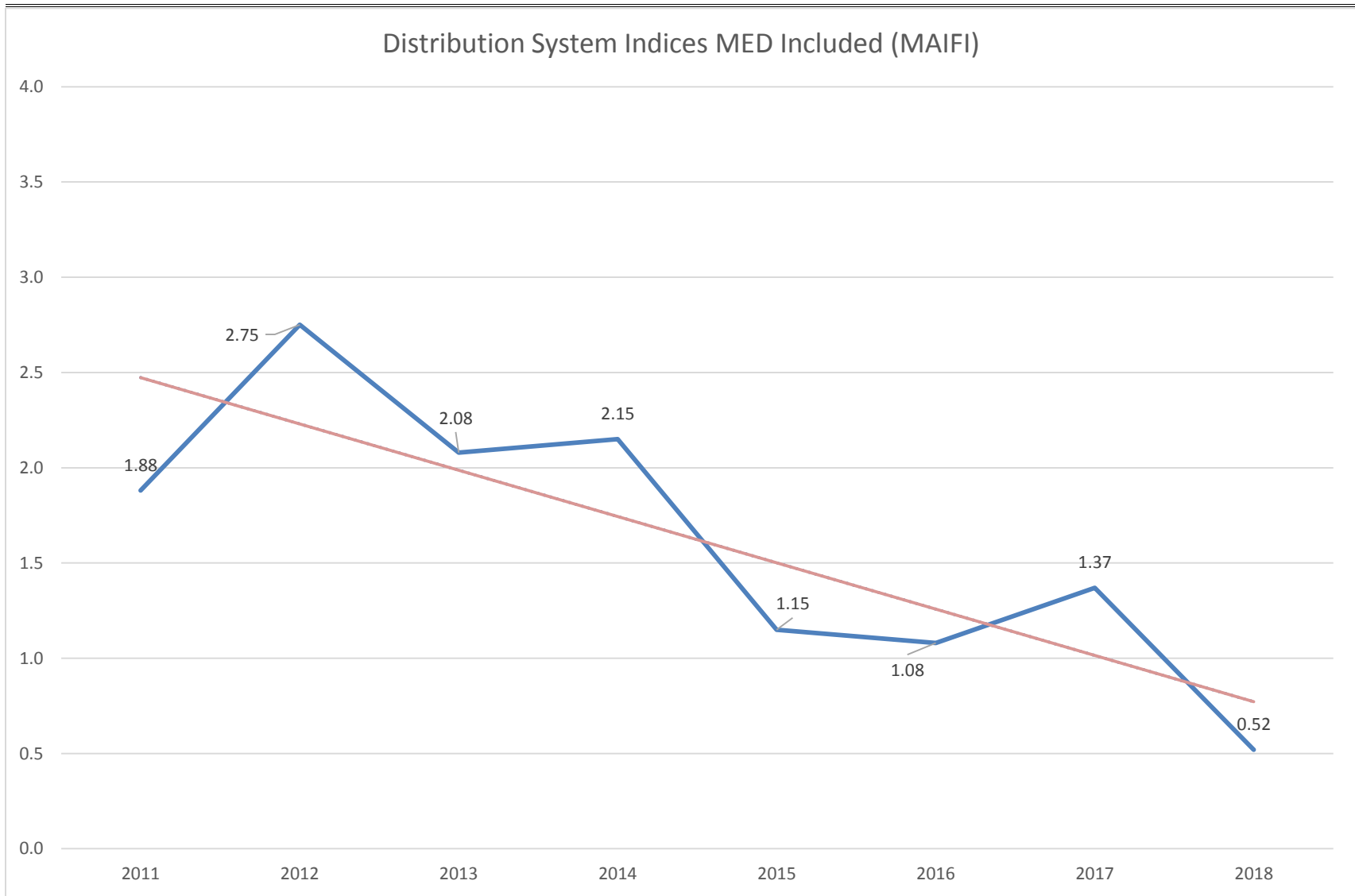
b. Separate charts showing a line graph of distribution system SAIDI, SAIFI, MAIFI, and CAIDI for the past 8 years (years in business) with linear trend line (TMED included and excluded).

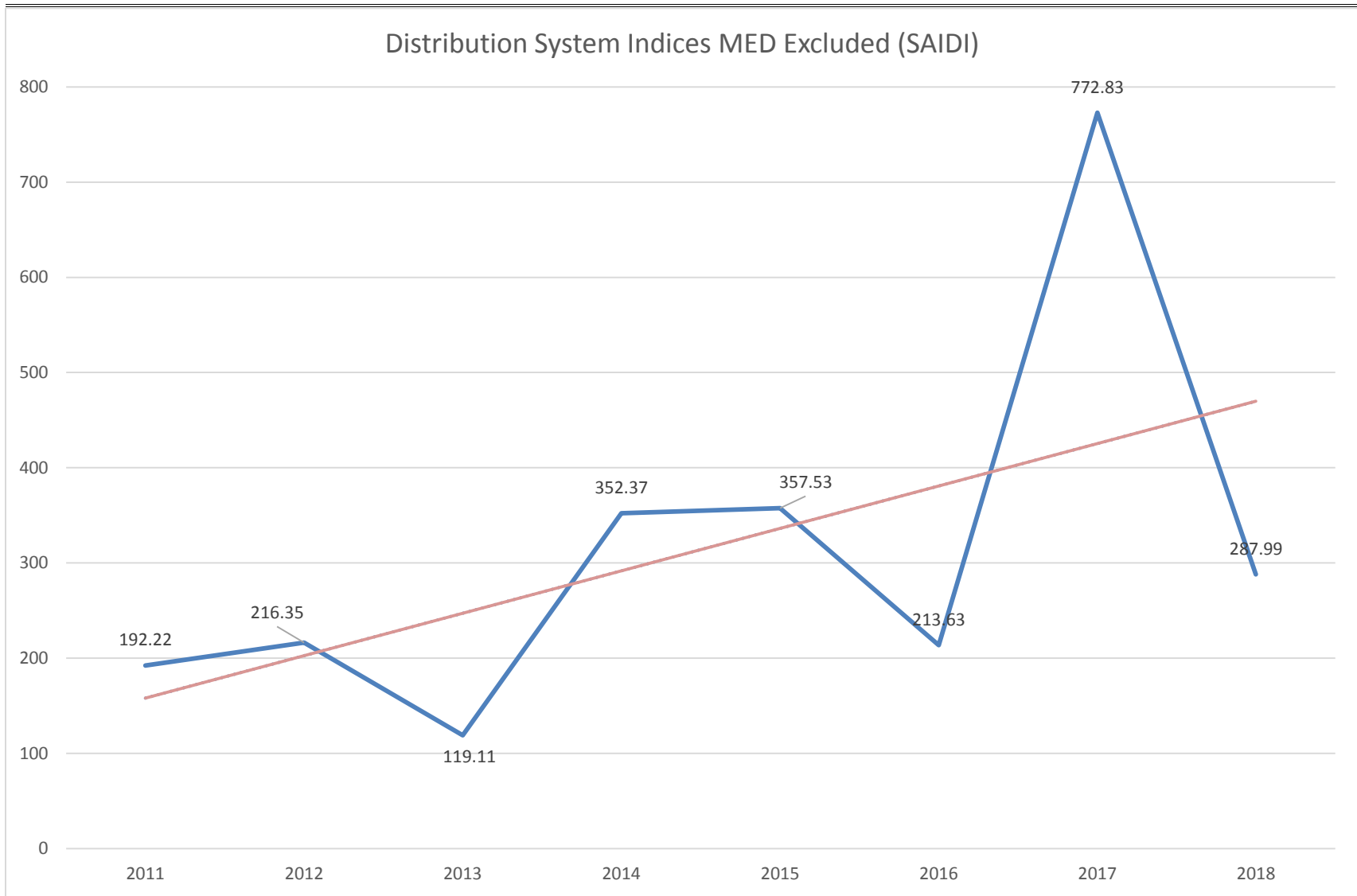


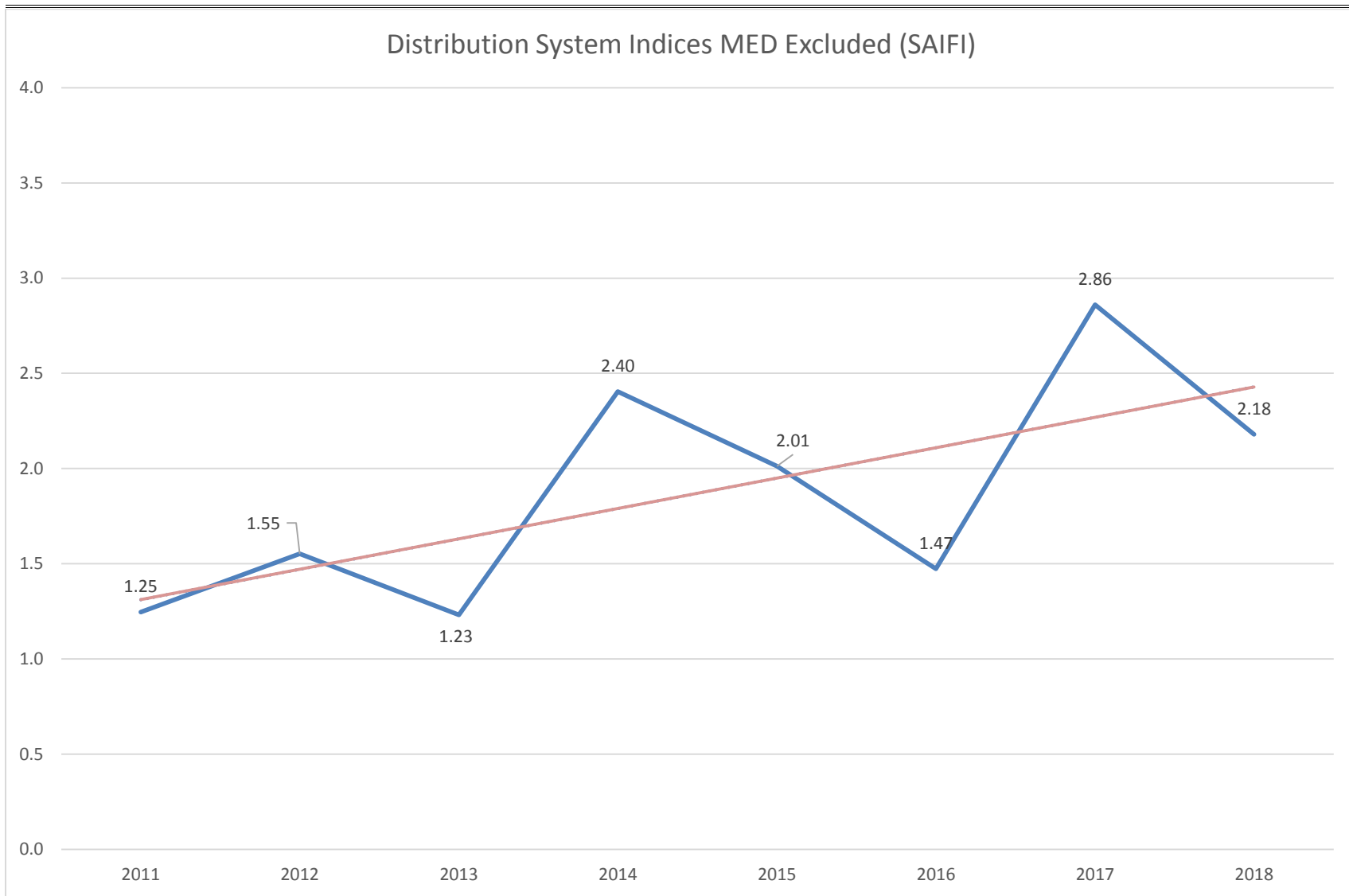


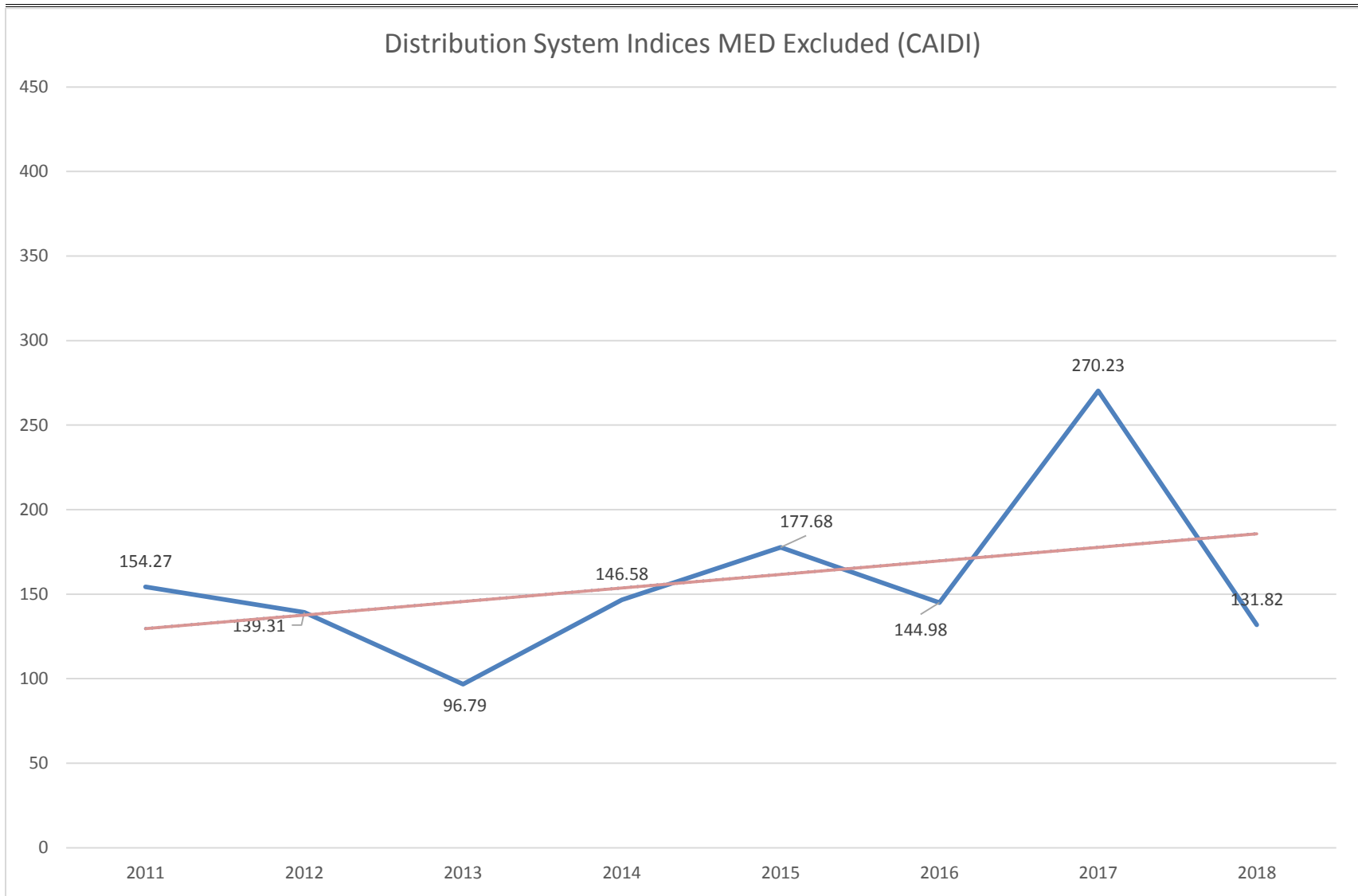


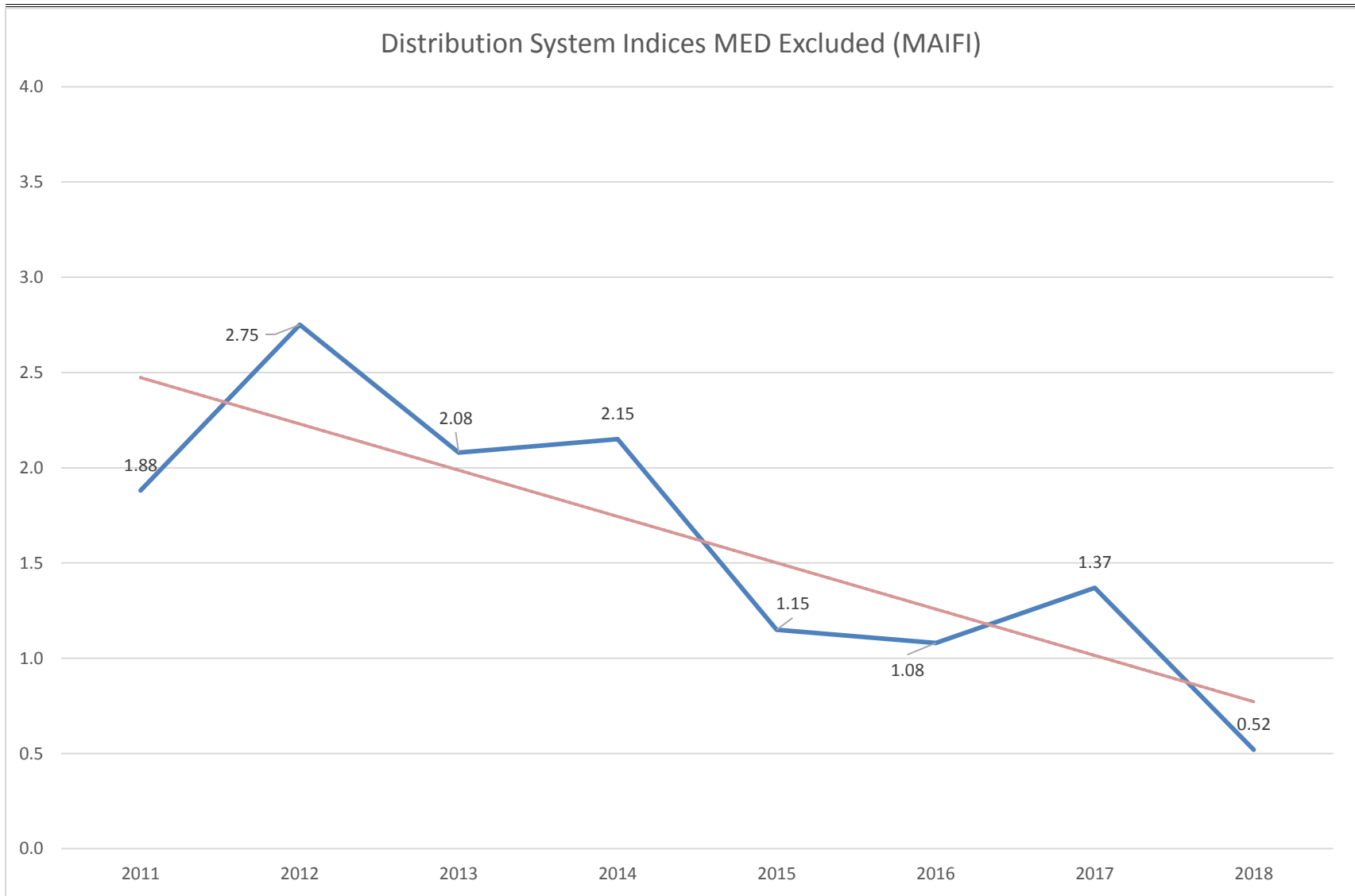












**2) Division (or District) Reliability Indices for the past 8 years**

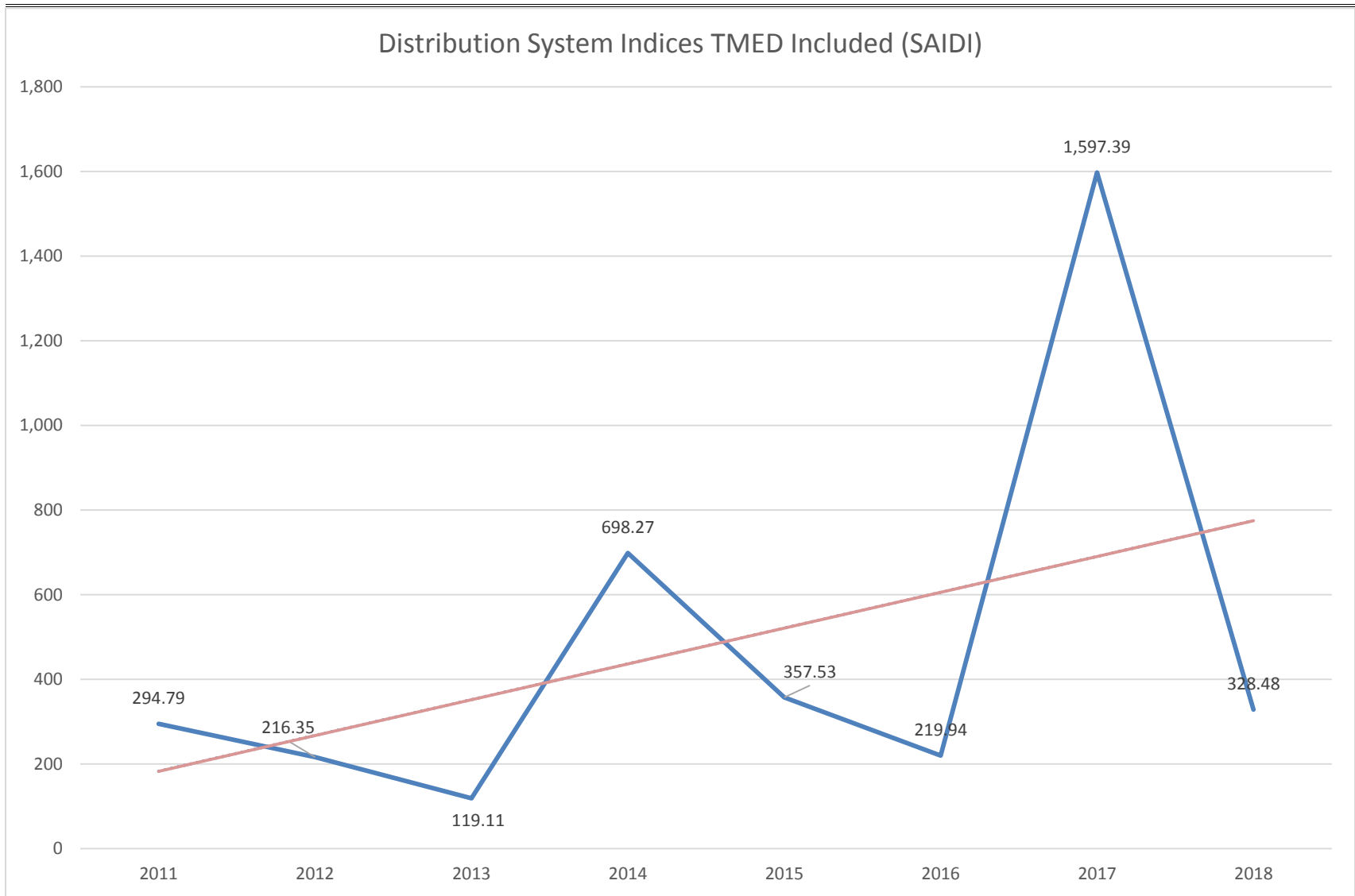
Liberty Utilities (CalPeco Electric), LLC has one division, Lake Tahoe. See section 1 for indices.

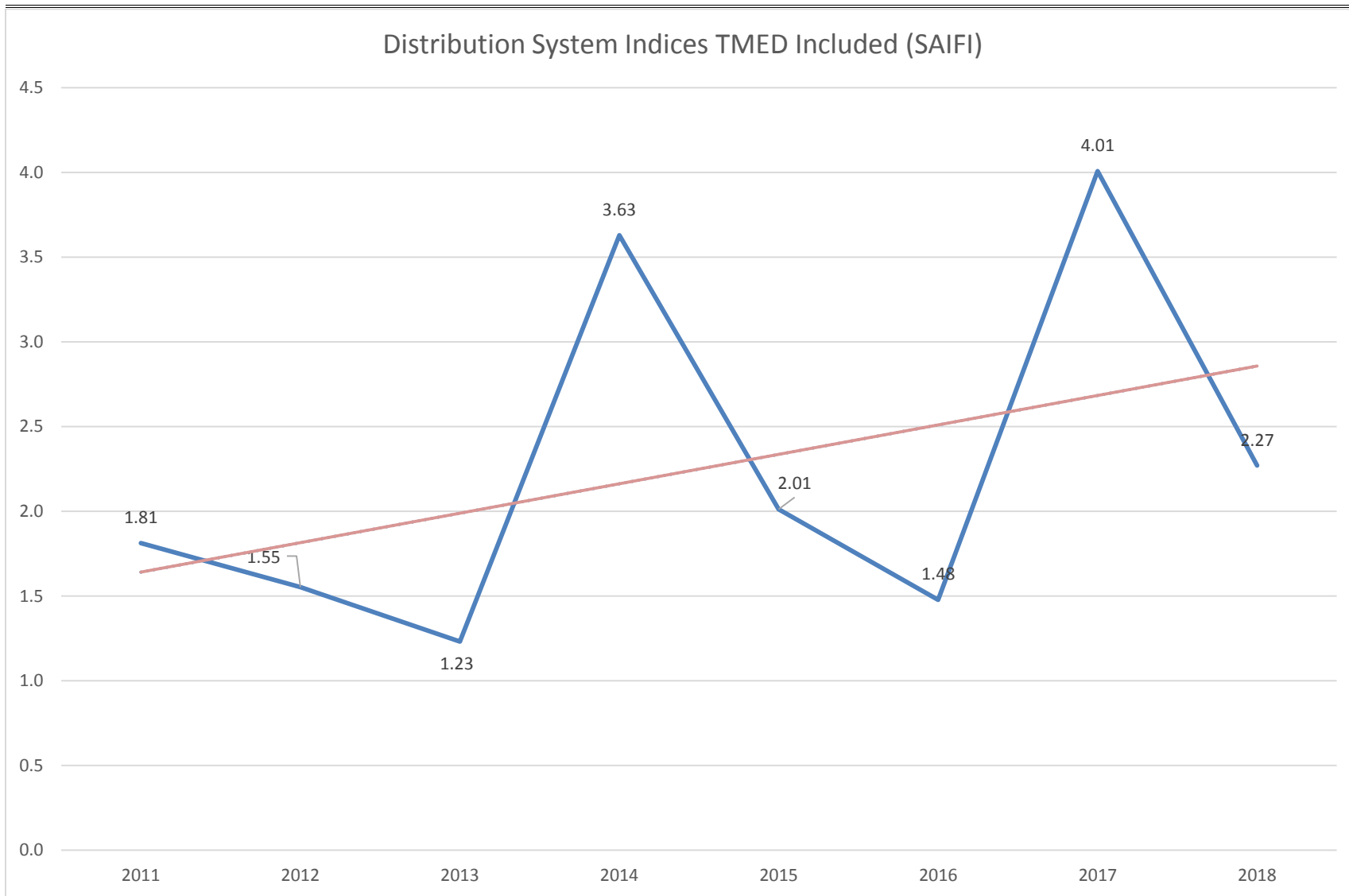
**3) System and Division indices based on IEEE 1366 for the past 8 years including planned outages and including and excluding TMED**

a. SAIDI, SAIFI, MAIFI, and CAIDI Data

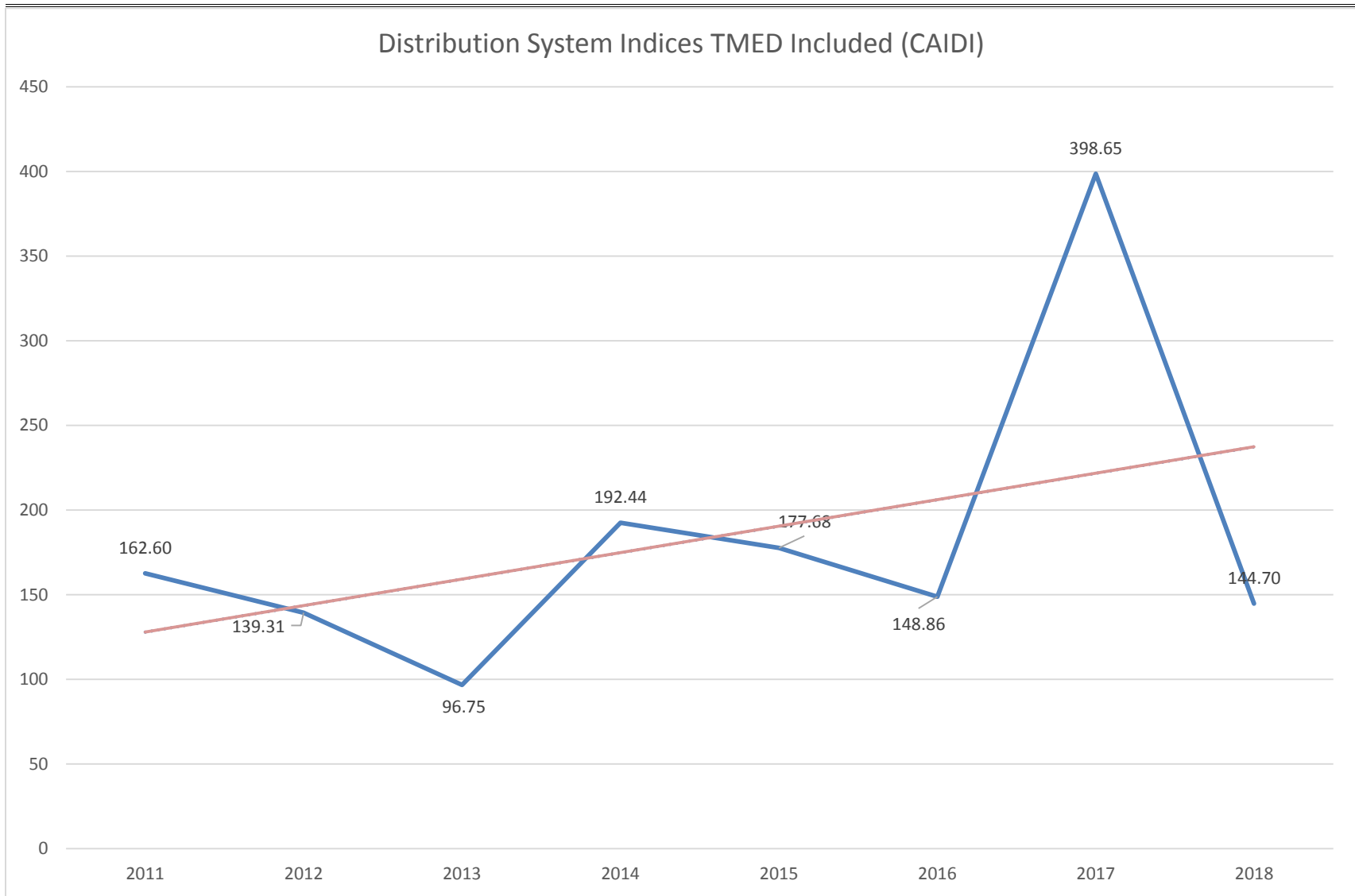
Liberty Utilities (CalPeco Electric), LLC <u>Distribution</u> Historical System Reliability Data 7 Years (Years in Business)								
Year	TMED Included				TMED Excluded			
	SAIDI	SAIFI	CAIDI	MAIFI	SAIDI	SAIFI	CAIDI	MAIFI
2018	328.48	2.27	144.70	0.52	328.48	2.27	144.70	0.52
2017	1597.39	4.01	398.65	1.37	772.84	2.89	267.42	1.37
2016	219.94	1.48	148.86	1.08	219.94	1.48	148.86	1.08
2015	357.53	2.01	177.68	1.15	357.53	2.01	177.68	1.15
2014	698.27	3.63	192.44	2.15	352.37	2.40	146.58	2.15
2013	119.11	1.23	96.75	2.08	119.11	1.23	96.79	2.08
2012	216.35	1.55	139.31	2.75	216.35	1.55	139.31	2.75
2011	294.79	1.81	162.60	1.88	192.22	1.25	154.27	1.88

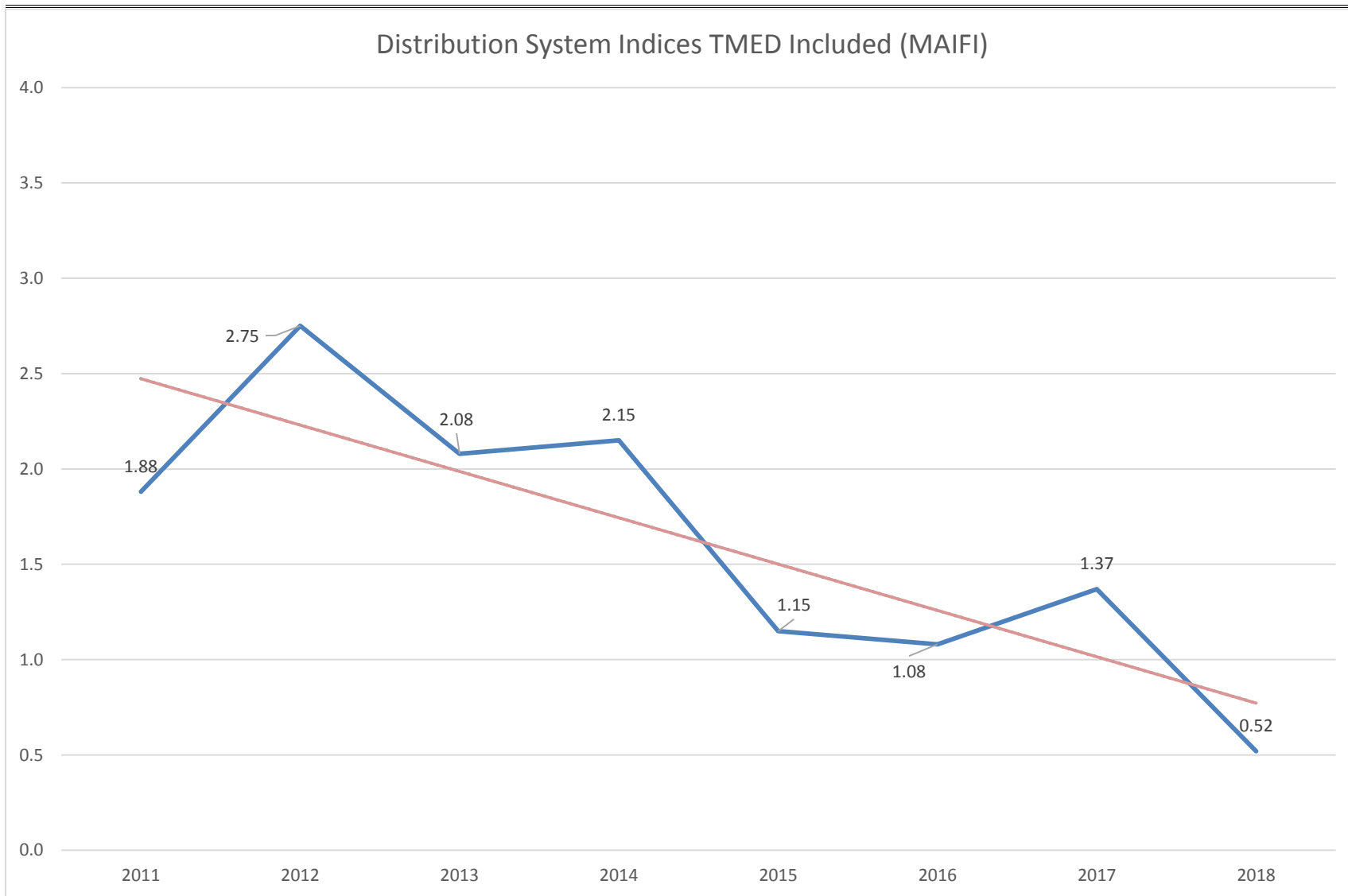
CalPeco Electric has been in business for 8 years and therefore does not have 10 years of data.

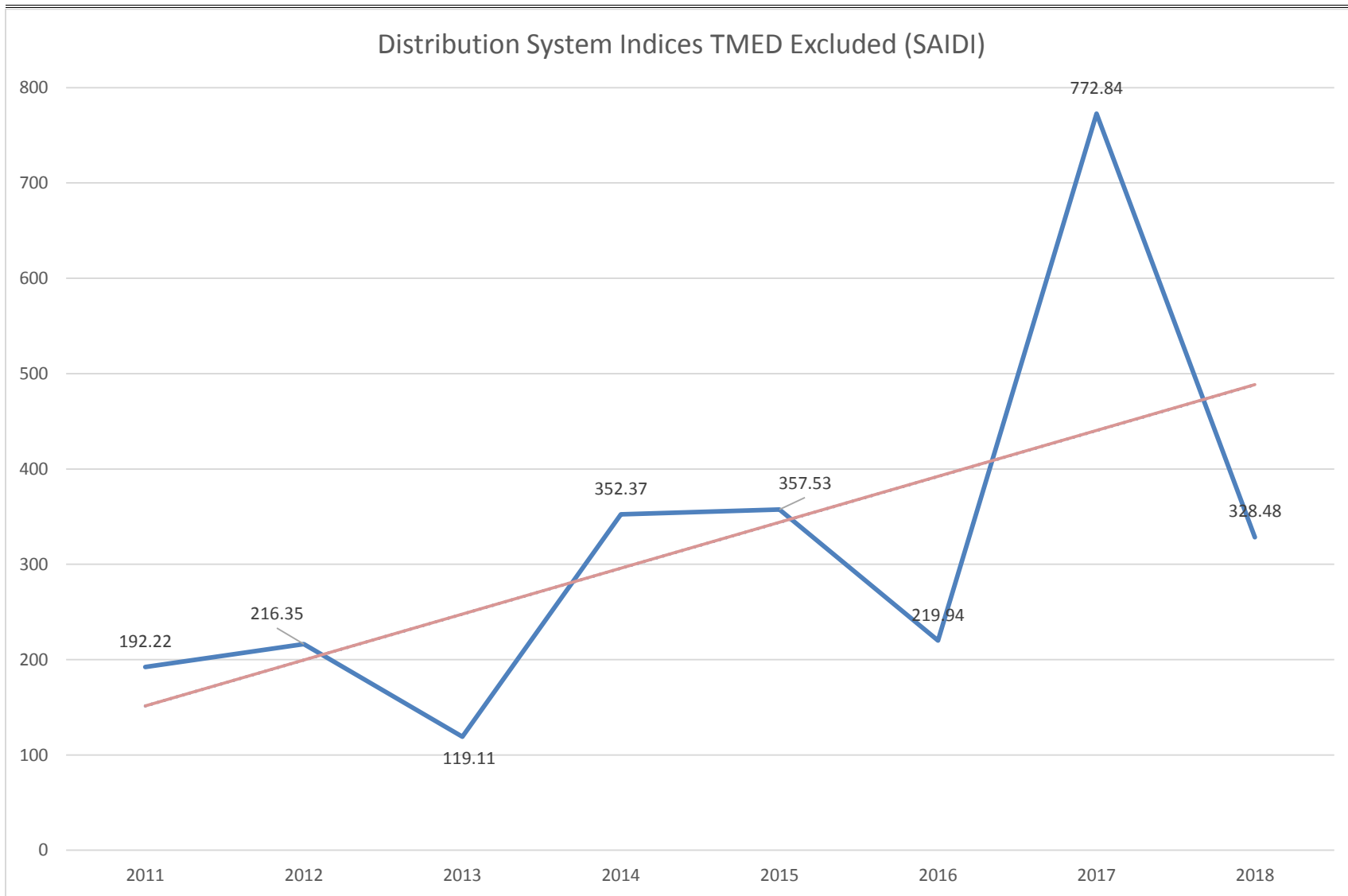


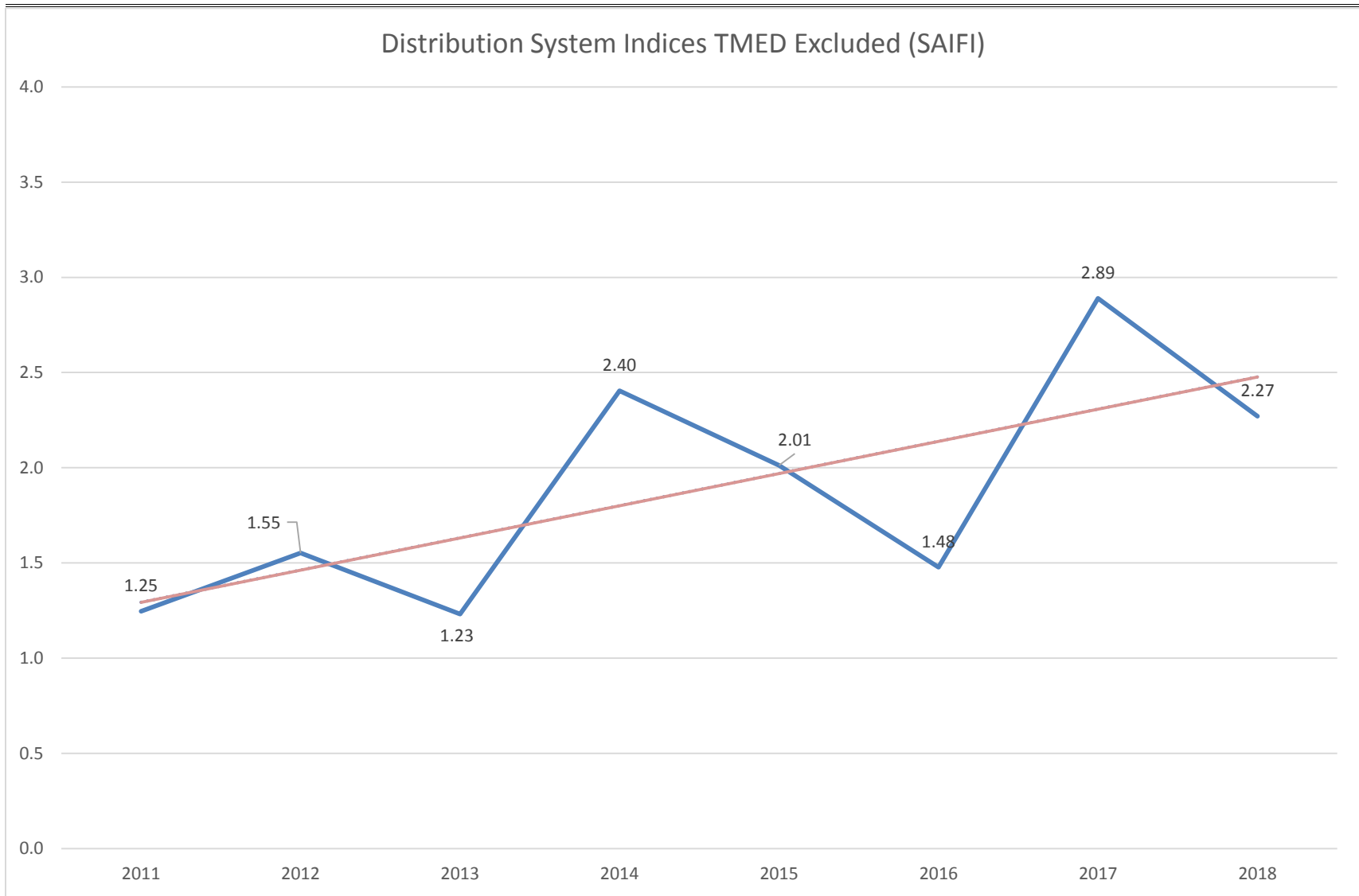


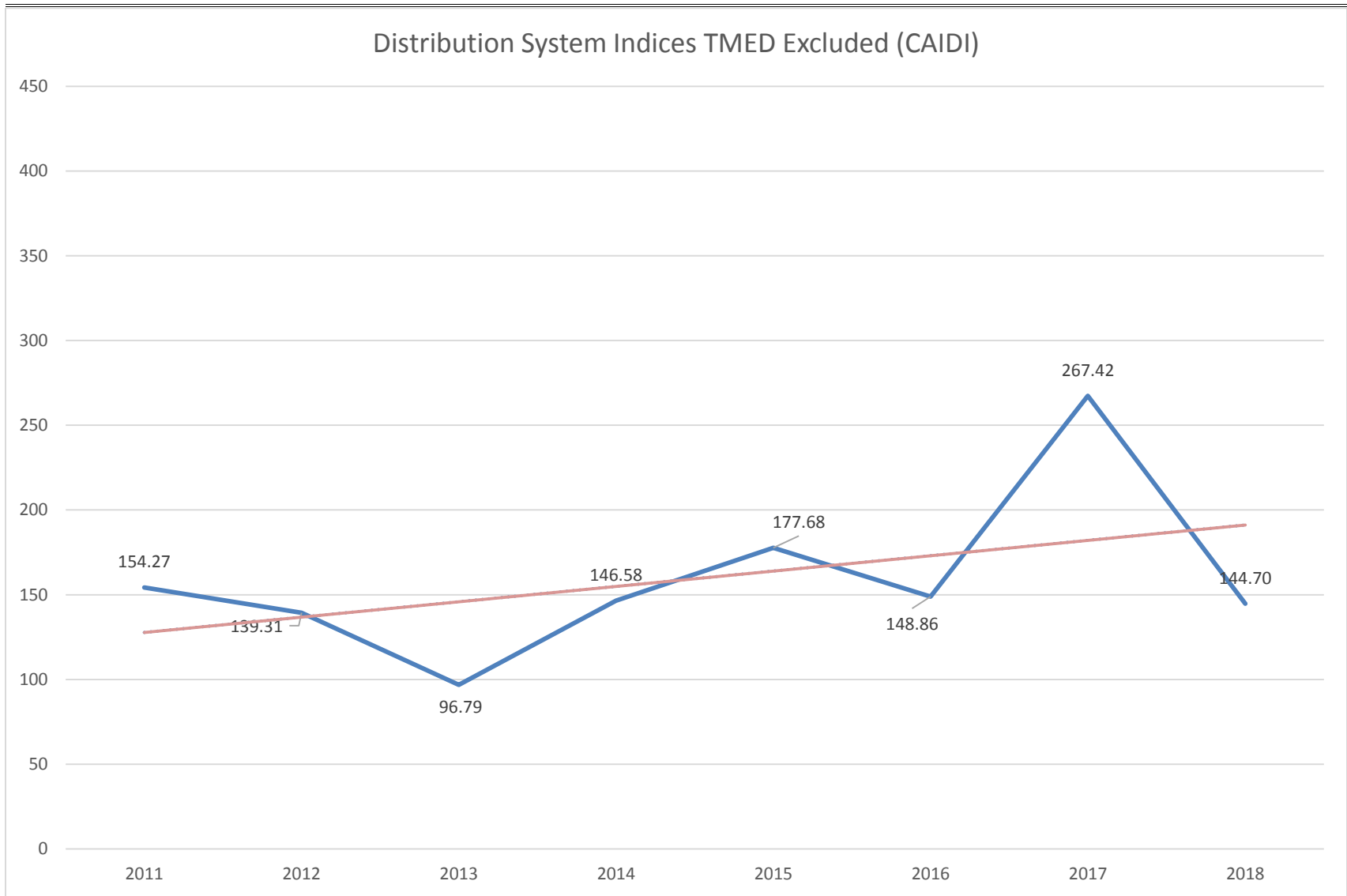


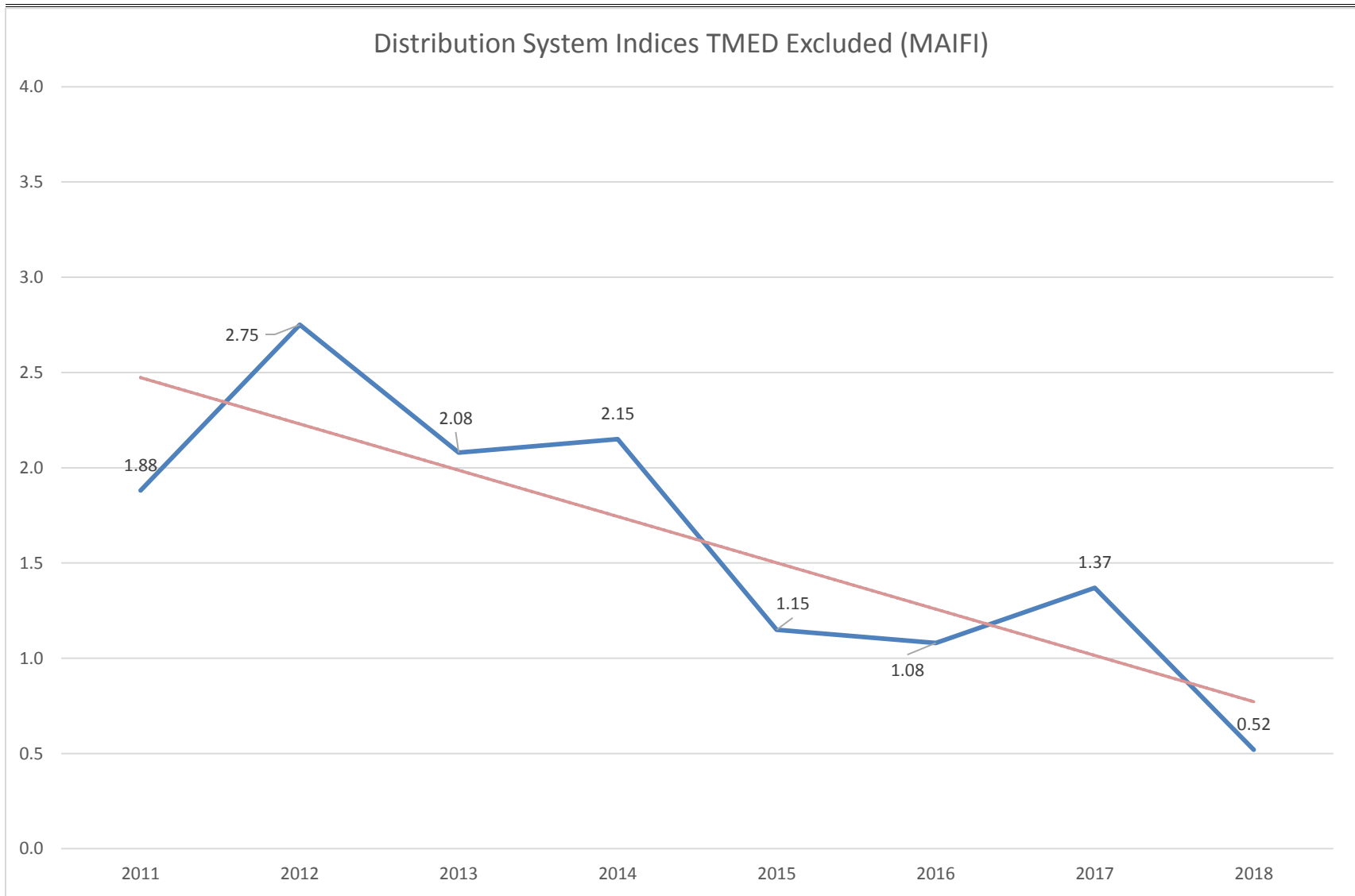








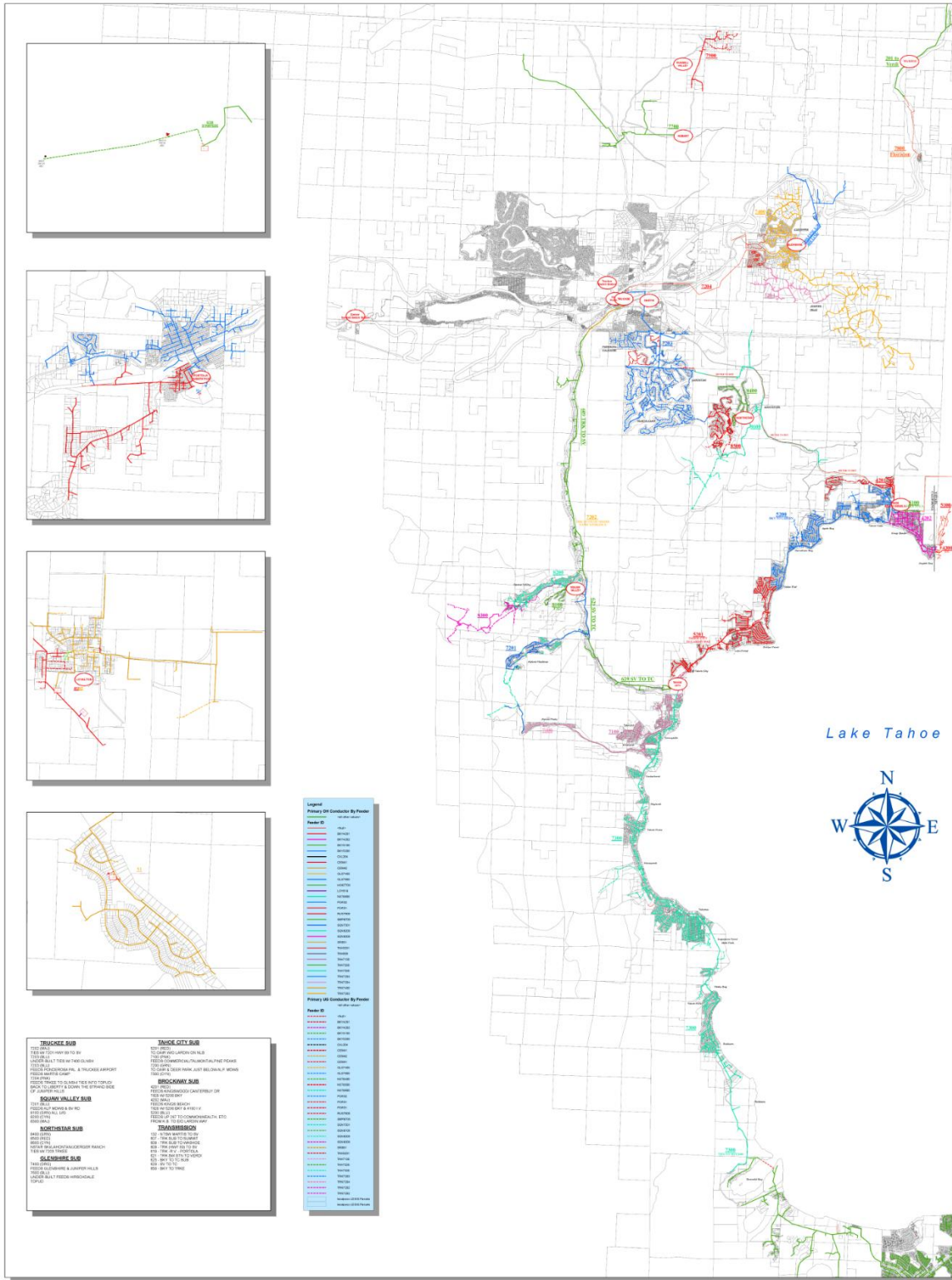




## b. The number, date, and location of planned outages

Circuit	Number of Planned Outages By Year							
	2018	2017	2016	2015	2014	2013	2012	2011
31	1			1				
32		2	1					
41			1					
201	7					1		
204			1					
619							1	
650				1			1	
1261	1							
1296	1	2		5	1			
2200				1	1			
2300	1			1	2		1	
3100	5	1					1	1
3101					2	2		
3200	5			1			1	
3300	10	2		3			2	
3400	4	3		5		2	4	
3500		6		1				
3501	3			2	2	4	1	1
4201	1		1					
4202	3	4				2	5	1
5100						1	1	
5200	4	1		4	1	1	3	
5201	1	5	5	4	1		1	
7100	2	1			1	1	4	
7200	1			1	1	1	2	
7201		4	1	2	1			
7202	1	1		2	3	1		
7203	2			2	2	4		
7300	14	5	6	4	16	4	5	2
7400	8	2	1	1				1
7600	1			1				1
7700					1			
7800					2			
8200	2	7	3	2	4			1
8300	1	2		6			2	
8400	7							
8500			1			1	2	
8600				4			2	

### 4) Service territory map including divisions of districts





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

- I. 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.

Circuit	District	Customer Count	Substation Name	Circuit Miles	Facilities		Number of Mainline/Feeder/Backbone Outages Per Year	*Circuit SAIDI	Circuit SAIFI
					OH	UG			
201*	Tahoe	64	Washoe	8.7	99.8%	0.2%	4	2722	3.5
1261	Tahoe	746	Topaz	70.9	76.2%	23.8%	8	2393	8.4

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 Washoe 201 circuit was noted as a deficient circuit in 2017 as well as 2018. The 3 year average circuit SAIDI score remains high due to significant outages in 2017 from wildfire and severe winter storms.

There were only 2 unplanned outages in 2018 for the 201 circuit, both due to a loss of source from a third party owned substation. Over 90% of the average circuit SAIDI score was accumulated during the 2017 winter storms and wildfire.

The historical metric for Washoe 201:

- 2018 – 2,722.9
- 2017 – 2,698.9
- 2016 – 269.2
- 2015 – 200.9

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 in difficult terrain, sourced by an NV Energy substation in Nevada. The line has been rebuilt in 2014 and Liberty completed a voltage conversion in 2018 so that the entire circuit is now 24.9kV.

The circuit performance in 2018 was similar to historical records, excluding 2017. The 2017 performance is an outlier and does not accurately reflect the condition of this circuit. Liberty expects this circuit will no longer be a deficient circuit no later than 2020 when the 2017 data is removed from the average.

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

Assumptions

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	5/17/2018	Third Party - Switching	Lake Tahoe	17,315	104.89	0.3723
2	12/12/2018	Loss of Source – External System	Lake Tahoe	7,552	0.97	0.1623
3	10/17/2018	Trees	Lake Tahoe	7,398	18.34	0.1591
4	12/12/2018	Loss of Source – External System	Lake Tahoe	7,089	0.91	0.1524
5	10/3/2018	Hardware Failure	Lake Tahoe	4,678	8.97	0.1005
6	6/9/2018	Trees - Major Storm	Lake Tahoe	4,485	8.28	0.0964
7	11/12/2018	Unknown	Lake Tahoe	4,154	9.46	0.8932
8	1/4/2018	Unknown	Lake Tahoe	3,529	0.91	0.0758
9	12/12/2018	Loss of Source – External System	Lake Tahoe	3,434	0.44	0.0738
10	8/4/2018	Loss of Source – External System	Lake Tahoe	2,721	10.41	0.0585

\*Based on customer impact

**7) Summary list of 2018 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.

TMED as of 2018 = 198.88

CalPeco Electric did not experience an event in 2018 where the daily SAIDI was higher than the calculated TMED.

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

\*Based on Customers Affected

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

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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

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Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
9	Primary Contact – 3 <sup>rd</sup> 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



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Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
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

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

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Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
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

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
1	NV Energy Outage	5/9/2011	24,550	3.02	74,059.17	Yes
2	Relays	2/17/2011	8,005	3.40	12,738.90	No
3	Overcurrent	3/20/2011	4,396	0.98	4,396.00	No
4	Trees	5/25/2011	4,120	10.23	21,658.83	No
5	Trees	11/18/2011	4,120	21.50	15,792.33	No
6	Lateral Fuse	3/16/2011	3,957	2.96	11,739.10	No
7	Bird/Animal	9/24/2011	3,885	0.25	769.50	No
8	Hardware Failure	9/12/2011	3,475	1.12	2,780.42	No
9	Relays	1/25/2011	3,201	1.68	5,388.35	No
10	Trees	6/29/2011	3,200	4.35	11,786.67	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 2018.

Date Received	Date Responded	Description of Inquiry























