

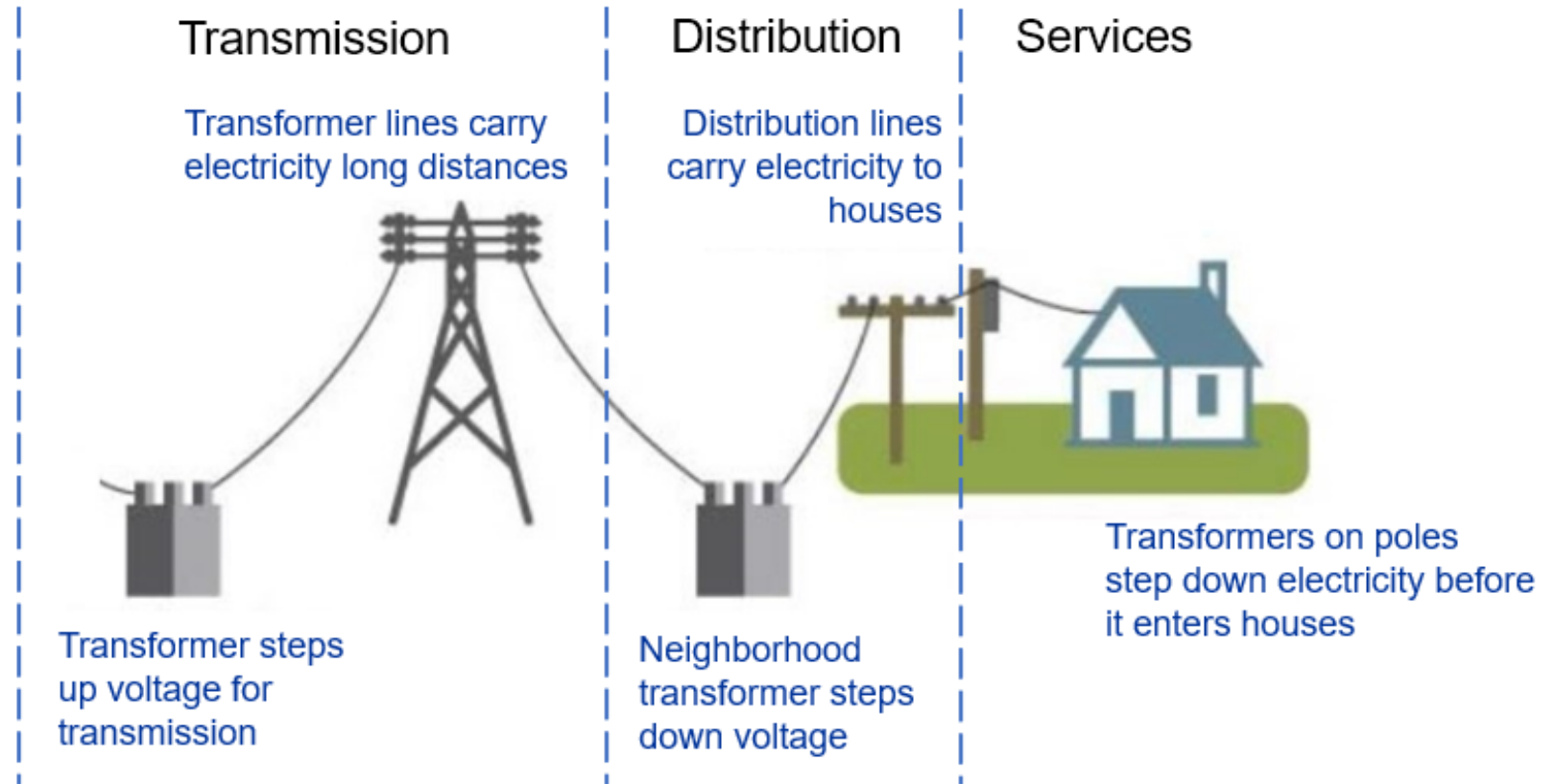


2023 Annual Electric Reliability Results

November 21, 2024



Classifications of our Assets



Source: Adapted from National Energy Education Development Project (public domain)

Reliability statistics are broken down by Transmission, Substation and Distribution

Reliability Goals & Metrics

- **Goals:**

- Provide our customers with safe and reliable power
- Improve reliability by reducing the number of outages, and their duration, experienced by our customers
- Review all outages and causes, validate trends and mitigate for new issues identified

- Four metrics to **measure performance**:

- System Average Interruption Duration Index (SAIDI)
- System Average Interruption Frequency Index (SAIFI)
- Customer Average Interruption Duration Index (CAIDI)
- Momentary Average Interruption Frequency Index (MAIFI)
- New in 2025 ... Customers Experiencing Multiple Interruptions (CEMI)
- New in 2025 ... Customers Experiencing Long Interruption Durations (CELID)

- **Major Event Day (MED):** A day in which the daily SAIDI exceeds a threshold value

Reliability Programs

Building a strategy around overall system-wide performance in both outage duration and frequency

- **Electric System Hardening (ESH)** – Fire prevention, safety and reliability with a primary focus on helping reduce wildfire risk and optimizing reliability improvements; Includes wood to steel pole conversions, covered conductor and strategic undergrounding
- **Vegetation Management** – Annual systematic and schedule-based approach, including pre-inspection, tree pruning, brush clearing, etc.
 - SDG&E tracks and manages ~490,000 trees and monitors 35,000 poles for brush clearance throughout its service territory
 - Program recognized by the National Arbor Day Foundation for 21 consecutive years



Reliability Programs



- **“Tee” Modernization** – Upgrading major connection points on the underground distribution system to enhance ability to restore service to customers after unplanned outages
- **Supervisory Control and Data Acquisition (SCADA)** – Direct operator control of more than 4,000 switches across the distribution network for quick restoration
- **iPredict** – Technology used to monitor underground cable and connectors to forecast failures BEFORE they occur
- **Business Services Project Coordination** – Customer outreach and outage notifications including restoration estimates

Reliability Programs



- **Meteorology** – Forecasting for proactive preparations for adverse weather conditions; This team is now a part of the ***Fire Science and Climate Adaptation*** department, to help focus combined efforts
- **Proactive Cable Replacement** – Planned replacement of underground distribution cables as a function of vintage and recent reliability performance
- **Aging Infrastructure Replacement**– Substations upgraded where major equipment has reached end of service life; Decades-old lower voltage distribution circuits are being upgraded to higher voltage operation for increased capacity

Reliability Programs

- **Inoperative Switches** – Replacing or removing switches that are nearing end of service life to facilitate quicker, safer restoration; Some switches are replaced with automated (SCADA) switches for improved restoration
- **Reducing Vehicle Contacts with Equipment** – Relocating key devices to reduce the chances of recurring outages due to vehicle contacts; Avoiding typical trouble spots when installing new equipment
- **Non-Conductive Balloon Development** – Worked with the party balloon industry to develop an alternative material that is less likely to cause outages when contacting overhead lines
 - Legislation signed into law in 2022 by the governor to enforce adoption of these new balloons in retail sales, which will be phased in over the next few years



Awards & Recognition



- **PA Consulting ReliabilityOne® Awards** – Leader in Energy and Utilities Consultations
 - Outstanding Reliability “Best in the West” for 19 consecutive years
 - “Best in the Nation” for 2018
 - “Best in the Nation” for 2020 (Shared with Florida Power & Light)
 - Outstanding Technology and Innovation for 2016, 2017 and 2019
 - Outstanding Grid Sustainability for 2020, 2022 and 2023

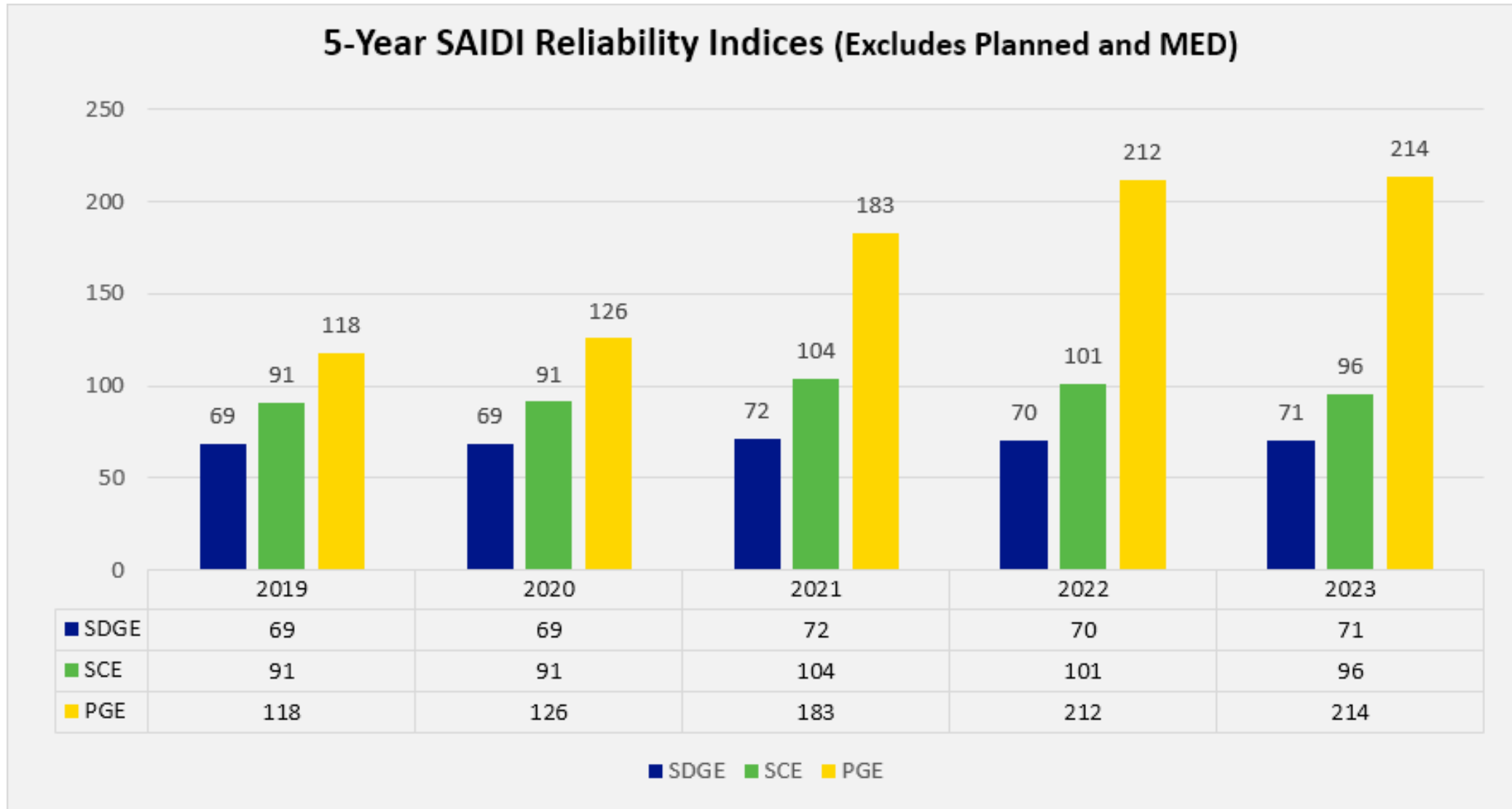


- **Edison Electric Institute** – 2018 Edison Award

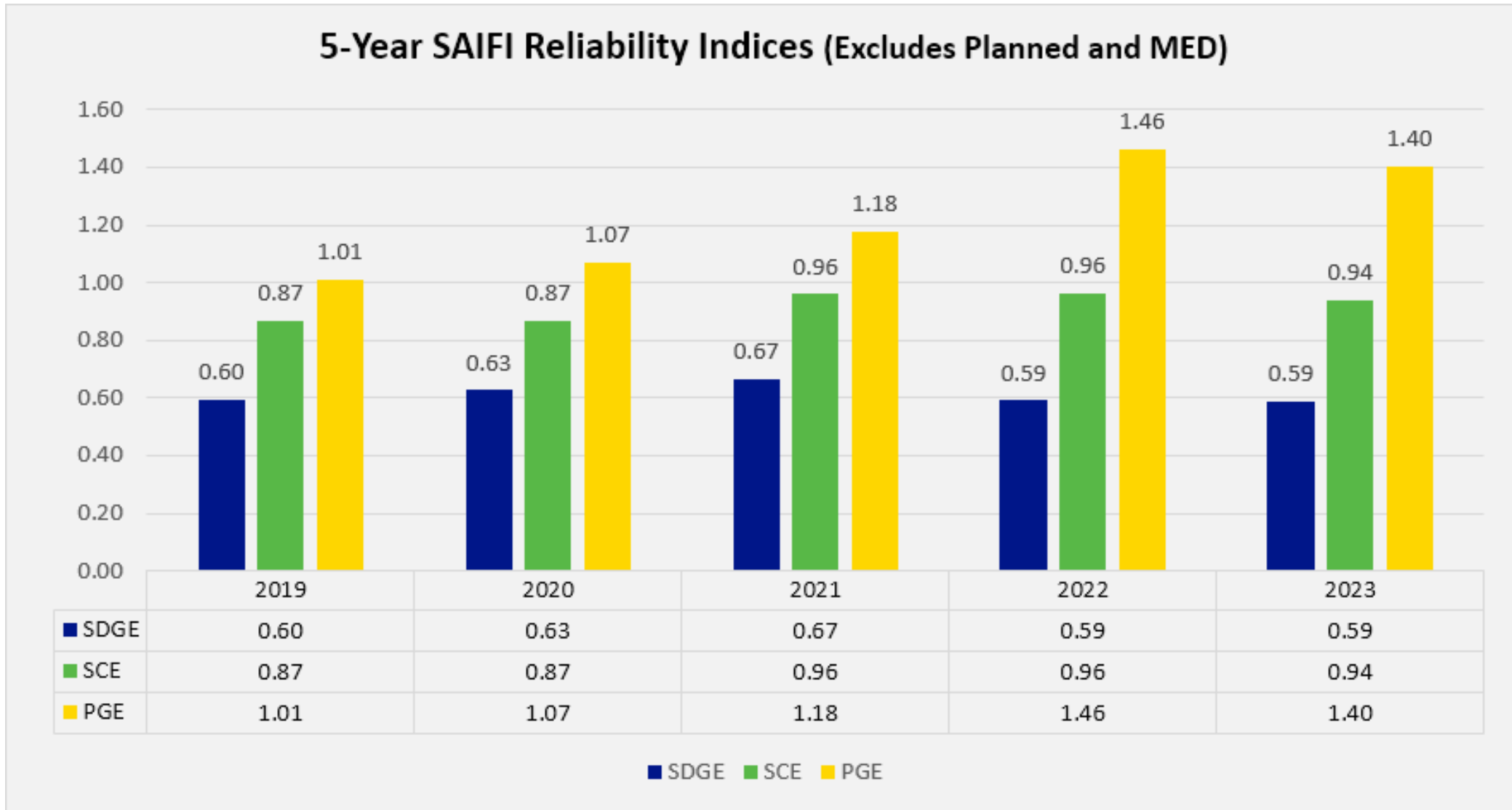


**How does SDG&E compare with
the other large California utilities?**

SAIDI Comparison – Past 5 Years



SAIFI Comparison – Past 5 Years



SDG&E's Annual Report

- **Section 1** – System Indices for the last 10 years
- **Section 2** – District Reliability Indices for the past 10 years, including and excluding MED
- **Section 3** – System and District Indices based on IEEE 1366 for the past 10 years, including planned outages and including / excluding MED
- **Section 4** – Service territory map including divisions of districts
- **Section 5** – Top 1% of Worst Performing Circuits (WPC) excluding MED
- **Section 6** – Top 10 major unplanned power outage events within a reporting year
- **Section 7** – Summary List of MED per IEEE 1366
- **Section 8** – Historical 10 largest unplanned outage events for the past 10 years
- **Section 9** – Number of customer inquiries on Reliability Data and the number of days per response

Section 1 – System Indices for the Past 10 Years

System Reliability

- Tables of reliability indices
- Graphs depicting indices

Table 1-1: System Indices

San Diego Gas & Electric Company System Reliability Data 2014 - 2023								
MED Included				MED Excluded				
Year	SAIDI	SAIFI	CAIDI	MAIFI	SAIDI	SAIFI	CAIDI	MAIFI
2014	75.81	0.632	119.88	0.262	64.60	0.603	107.16	0.244
2015	58.11	0.530	109.68	0.347	57.92	0.526	110.09	0.347
2016	86.01	0.677	126.99	0.443	72.75	0.620	117.43	0.386
2017	117.49	0.585	200.87	0.344	64.51	0.512	125.92	0.311
2018	121.02	0.658	183.88	0.319	77.76	0.628	123.84	0.319
2019	122.96	0.639	192.38	0.299	68.64	0.596	115.23	0.299
2020	198.63	0.745	266.52	0.289	68.95	0.627	109.92	0.275
2021	76.93	0.670	114.84	0.421	71.64	0.665	107.66	0.421
2022	70.39	0.591	119.06	0.327	70.39	0.591	119.06	0.327
2023	70.59	0.587	120.18	0.252	70.59	0.587	120.18	0.252

Section 2 – District Indices for the Past 10 Years

SDG&E’s service territory is divided into Six Districts

- Tables of reliability indices
- Graphs depicting indices

Table 2-5: Northeast – District Reliability Indices

Year	MED Included					MED Excluded			
	SAIDI	SAIFI	CAIDI	MAIFI		SAIDI	SAIFI	CAIDI	MAIFI
2014	95.74	0.899	106.48	0.174		75.92	0.832	91.22	0.173
2015	63.02	0.764	82.49	0.359		62.25	0.755	82.40	0.359
2016	93.94	0.815	115.27	0.323		82.15	0.779	105.39	0.270
2017	234.23	0.739	316.98	0.203		79.82	0.651	122.59	0.182
2018	244.84	0.788	310.65	0.200		90.33	0.694	130.20	0.200
2019	282.64	0.808	349.68	0.301		108.37	0.683	158.71	0.301
2020	539.87	1.166	463.18	0.251		97.92	0.843	116.14	0.218
2021	95.83	0.881	108.71	0.237		89.61	0.875	102.47	0.237
2022	86.56	0.740	116.94	0.267		86.56	0.740	116.94	0.267
2023	83.84	0.741	113.21	0.205		83.84	0.741	113.21	0.205

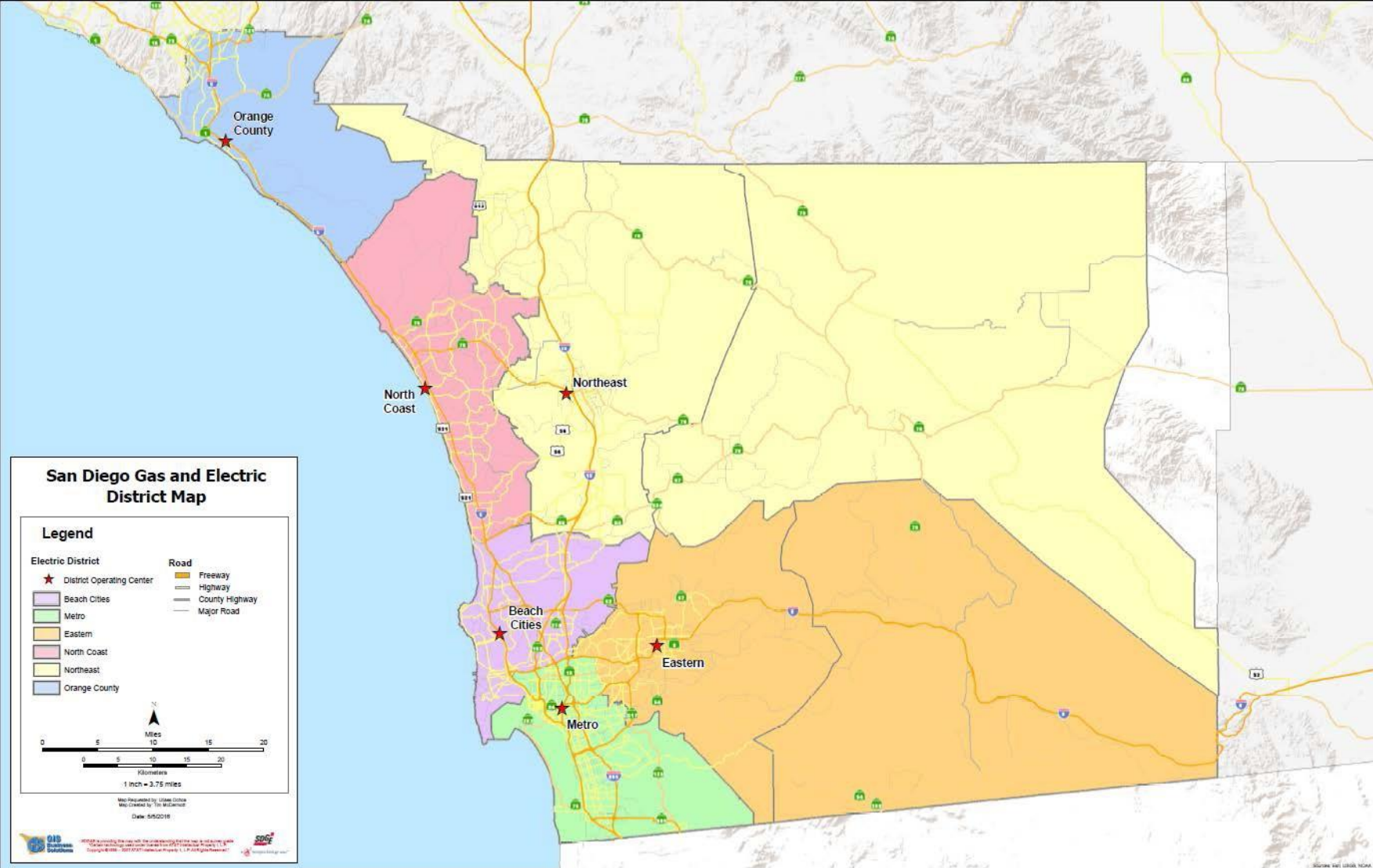
Section 3 – System & District Indices for the Past 10 Years, Including Planned Outages

The data used to develop the planned outage indices in the report is from an outage management system implemented in late 2012

- Ten years of historical planned outage data is now currently available
- Thousands of upgrades performed annually to improve service

System Indices (2014 – 2023) Planned and Unplanned									
Year	MED Included					MED Excluded			
	SAIDI	SAIFI	CAIDI	MAIFI		SAIDI	SAIFI	CAIDI	MAIFI
2014	105.94	0.746	141.92	0.277		94.72	0.717	132.13	0.259
2015	100.59	0.661	152.16	0.370		100.40	0.657	152.72	0.370
2016	122.06	0.802	152.18	0.467		108.78	0.744	146.21	0.409
2017	164.71	0.744	221.32	0.368		111.57	0.671	166.22	0.335
2018	167.13	0.827	202.15	0.344		123.87	0.796	155.52	0.344
2019	166.42	0.805	206.71	0.343		111.72	0.760	146.99	0.343
2020	244.05	0.917	266.09	0.326		114.19	0.798	143.02	0.312
2021	149.14	0.918	162.39	0.445		143.85	0.914	157.40	0.445
2022	137.61	0.806	170.73	0.339		137.61	0.806	170.73	0.339
2023	132.30	0.789	167.59	0.257		132.30	0.789	167.59	0.257

Section 4 – Service Area Map



Section 5 – Top 1% of Worst Performing Circuits (WPC), excluding MED

- Tables of Worst Performing Circuits
- Tables of deficient WPC
- Explanation of ranking as a deficient WPC

Table 5-1: 2023 Worst SAIDI Circuits based upon 2022-2023 data (Excludes Planned, MED and Load Curtailment)

Circuit	District	Circuit Customers	Substation Name	Circuit Miles	% OH	% UG	Annualized Feeder Outage Count	Annualized Total Circuit SAIDI **
CTL1	Northeast	199	CRESTLINE	5.8	69%	31%	8	2298
171	Northeast	1192	BORREGO	45.9	64%	36%	3	1256
CCB1	Beach Cities	172	COUNTRY CLUB	3.3	3%	97%	2	962
172	Northeast	994	BORREGO	58.5	67%	33%	4	875
170	Northeast	610	BORREGO	52	68%	32%	3	874
340	Metro	4030	SUNNYSIDE	39.9	20%	80%	1	673
RA3	Northeast	369	RAMONA	3.6	82%	18%	3	660
558	Orange County	1256	TRABUCO	17.7	21%	79%	2	649
EO2	Metro	616	EO2	5.1	68%	32%	1	649
757	North Coast	807	BATIQUITOS	7.9	0%	100%	1	607

* Circuit appeared for three consecutive years on the worst performance list (No circuits qualified)

** Circuit SAIDI represents all outages: Feeder and Branch

Section 6 – Top 10 Major Unplanned Outages in 2023

Displays the ten largest unplanned outage events

- Based upon Customer Impact

Top 10 Major Unplanned Power Outage Events						
Rank	Outage Date	Cause	Location	Customer Impact	SAIDI	SAIFI
1	8/20/2023	Severe Weather	BC, CM, EA, NC, NE, OC	35,952	2.28	0.024
2	1/16/2023	Severe Weather	BC, CM, EA, NC, NE	27,269	3.03	0.018
3	5/6/2023	Faulted Cable	CM	15,622	0.73	0.010
4	2/21/2023	Severe Weather	CM, EA, NC, NE	14,182	3.23	0.009
5	1/7/2023	Vehicle Contact	CM, EA	11,224	1.44	0.007
6	11/6/2023	Undetermined	NC, NE	10,905	0.13	0.007
7	2/22/2023	Severe Weather	BC, CM, EA, NC, NE	9,674	1.04	0.006
8	3/1/2023	Severe Weather	BC, CM, EA, NC, NE	7,820	0.84	0.005
9	11/6/2023	Crew Error	NC	6,798	0.13	0.005
10	3/21/2023	Severe Weather	EA, NC, NE	6,653	0.36	0.004

Section 7 – Summary List of 2023 Major Event Days (MED)



- SDG&E did not experience any Major Event Days (MED) in 2023

Section 8 – Historical 10 Largest Unplanned Outage Events for the past 10 Years

Displays the ten largest unplanned outage events for each of the years from 2014-2023

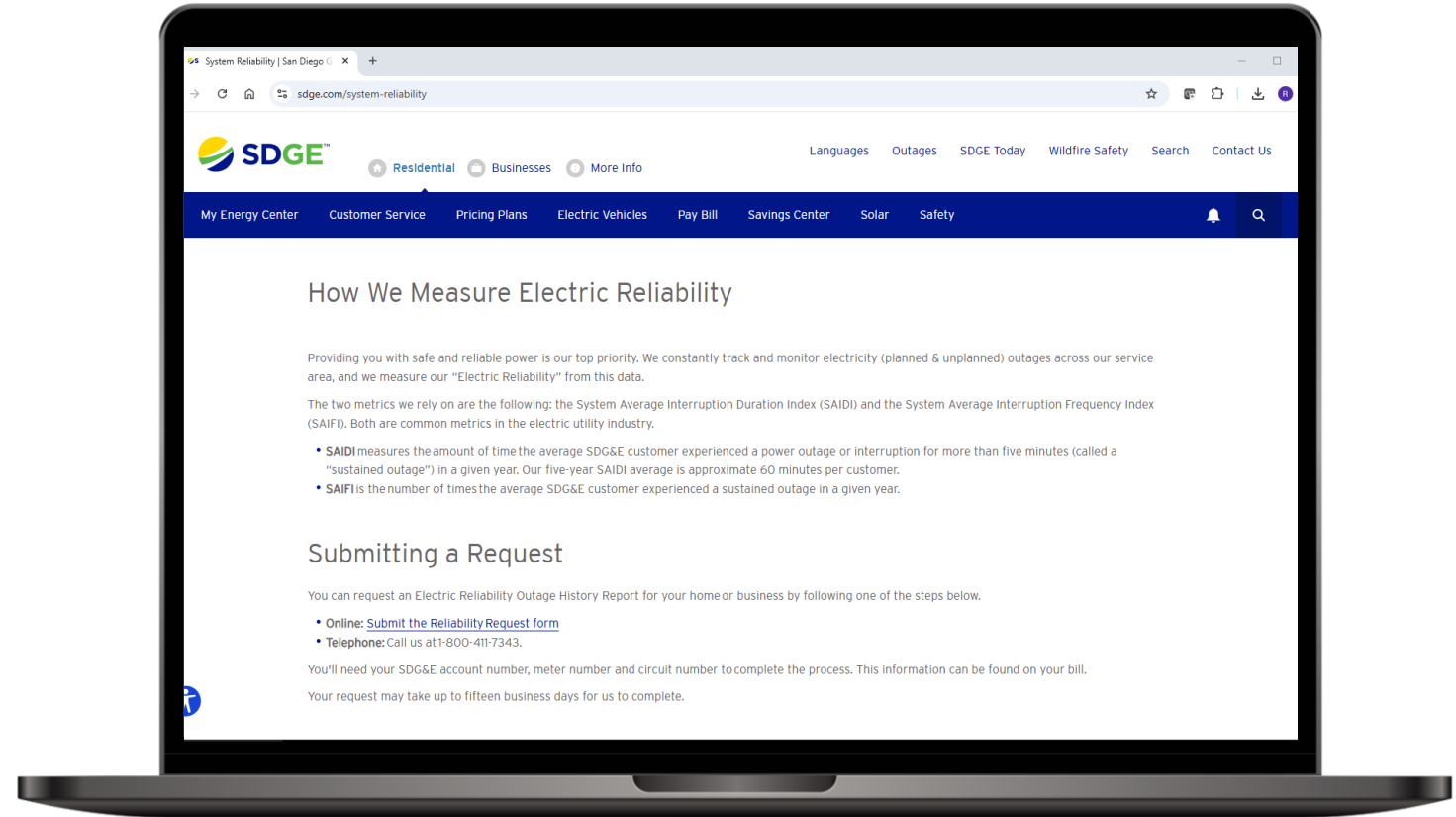
- Based upon SAIDI impact

Historical 10 Largest Unplanned Outage Events				
Rank	Date	SAIDI	SAIFI	Description
1	2/21/2023	3.23	0.009	Severe Weather
2	1/16/2023	3.03	0.018	Severe Weather
3	8/20/2023	2.28	0.024	Severe Weather
4	1/7/2023	1.44	0.007	Vehicle Contact
5	4/30/2023	1.22	0.002	UG Cable Failure
6	12/16/2023	1.04	0.002	Tee Connector
7	2/22/2023	1.04	0.006	Severe Weather
8	12/12/2023	0.90	0.002	Vehicle Contact
9	3/1/2023	0.84	0.005	Severe Weather
10	1/15/2023	0.80	0.001	Tee Connector

Section 9 – Website – Outage Inquiries

Find information or submit a request:

sdge.com/system-reliability



Social Media

Connect with us on our social media channels



x.com/SDGE



Facebook.com/SanDiegoGasandElectric



[Instagram @sdge](https://www.instagram.com/sdge)

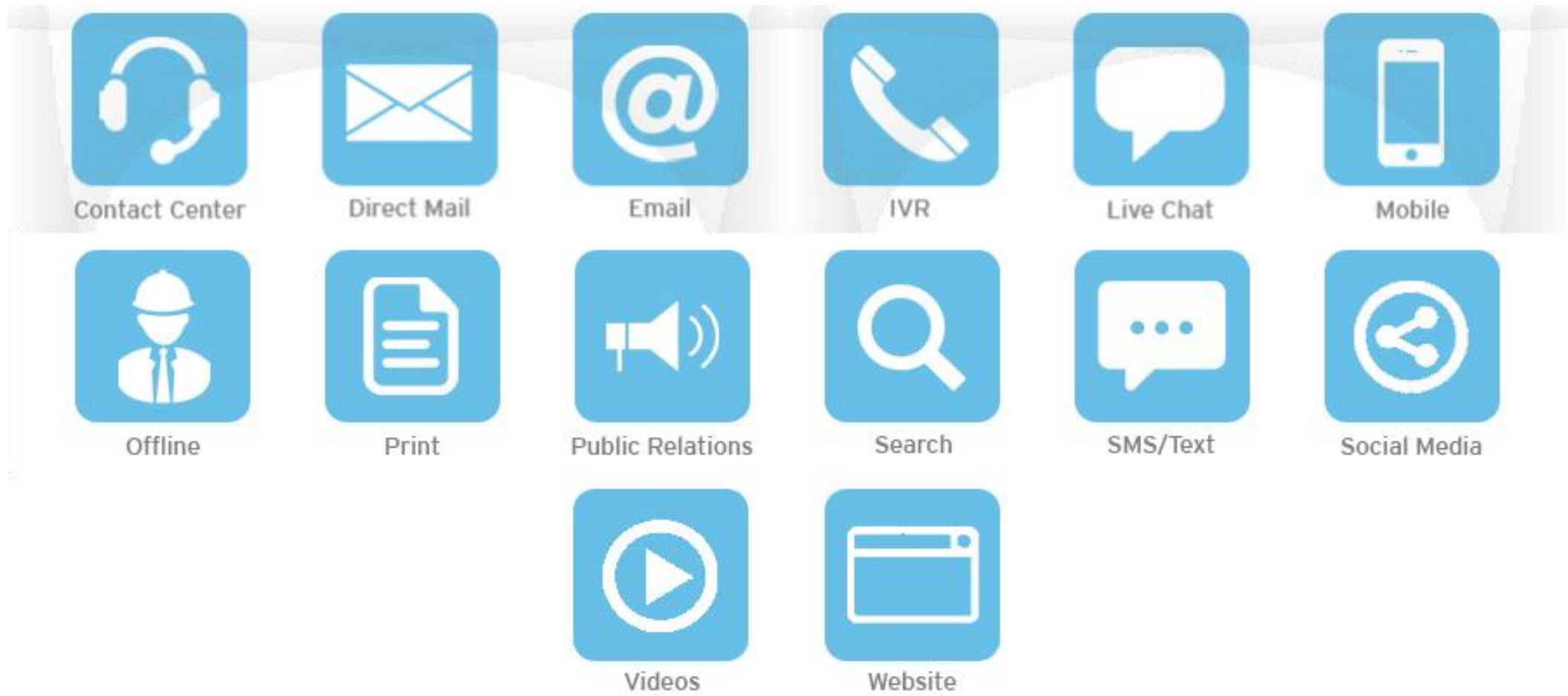


[YouTube @SanDiegoGasElectric](https://www.youtube.com/@SanDiegoGasElectric)



LinkedIn.com/company/SDGE

Customer Engagement Channels

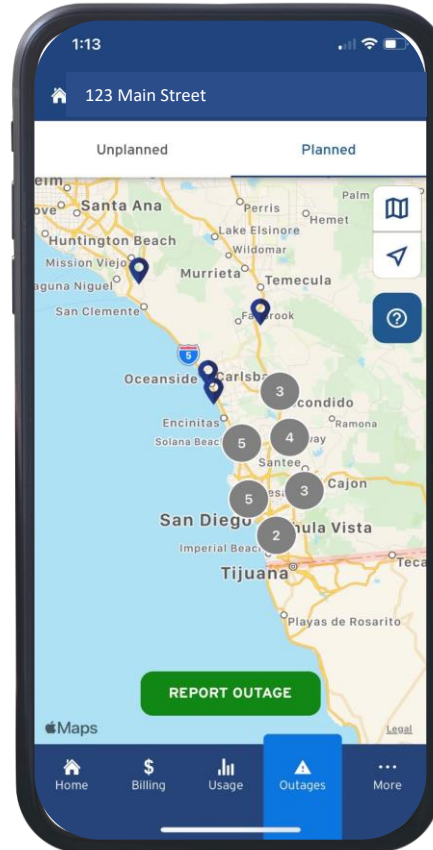
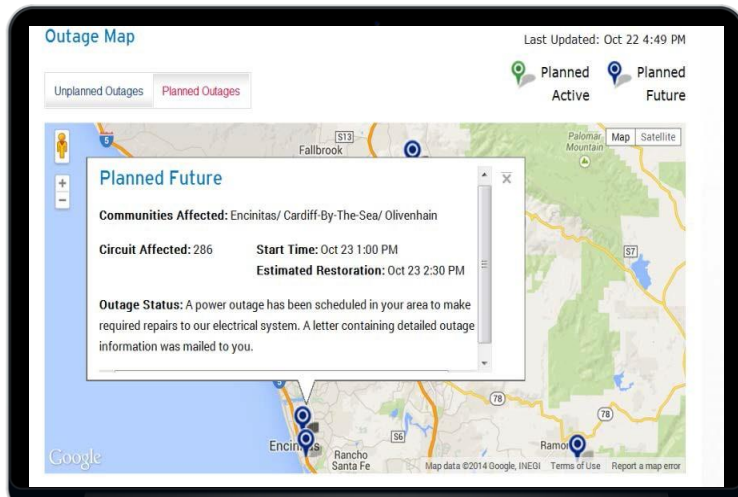


Customer Outage Tools



MyEnergyCenter.com or
Mobile App

Outage Map



Outage Video



Summary At A Glance

- Classification of Assets & Reliability Metrics
 - SAIDI
 - SAIFI
 - CAIDI
 - MAIFI
 - MED
- SDG&E Reliability Programs
 - ESH
 - Vegetation Management
 - Data Gathering/Circuit Analysis
 - Business Services Project Coordination
 - Meteorology
 - Others
- Comparison of 3 Largest IOUs in California



Summary At A Glance

- SDG&E 2023 Annual Report available on
 - cpuc.ca.gov
 - sdge.com/system-reliability
- Social Media
- Customer Engagement Channels
- Customer Outage Tools





Thank You