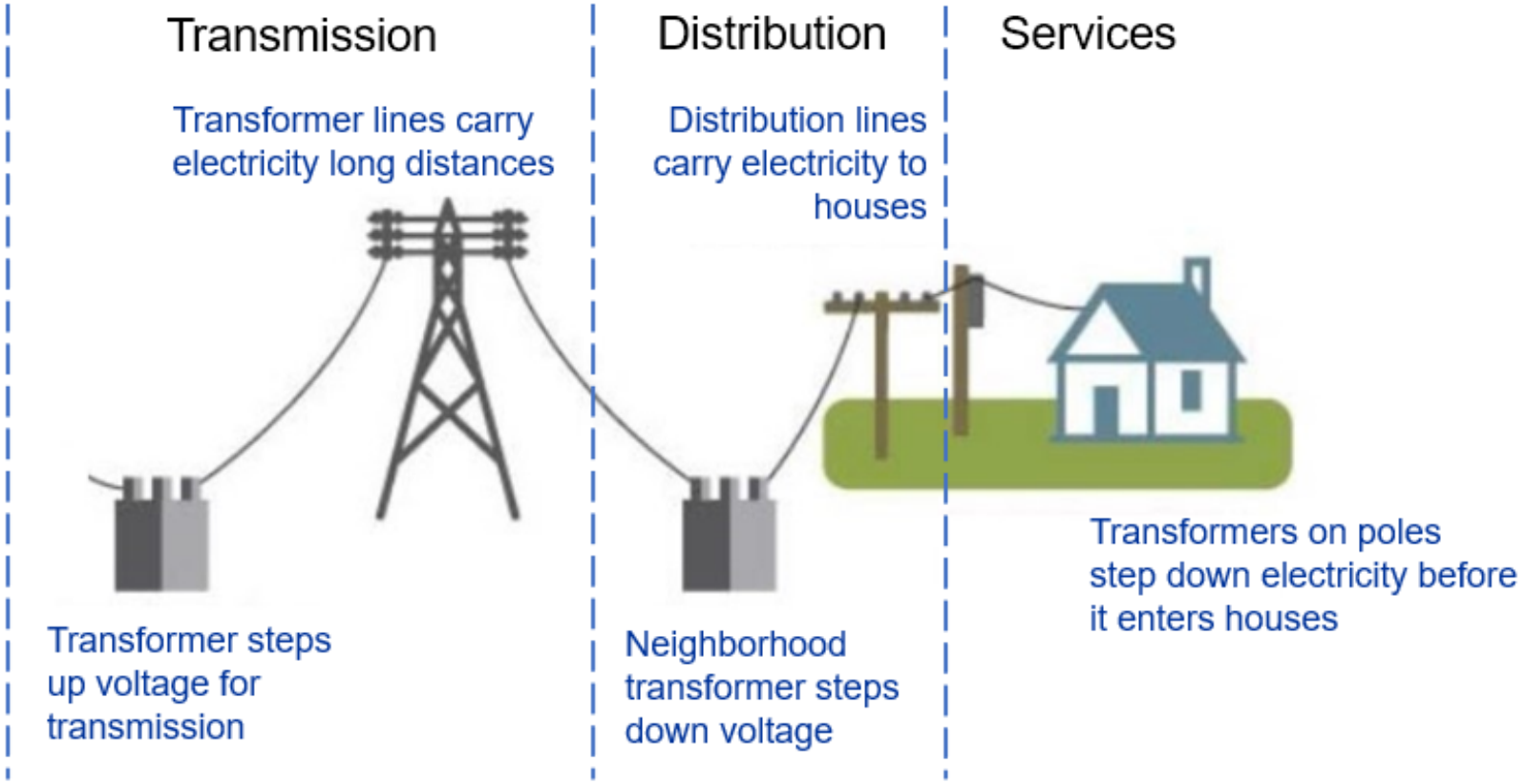
2022 Annual Electric Reliability Results

December 13, 2023

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 2024 … Customers Experiencing Multiple Interruptions (CEMI)
  - New in 2024 … 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 phased in over the next few years

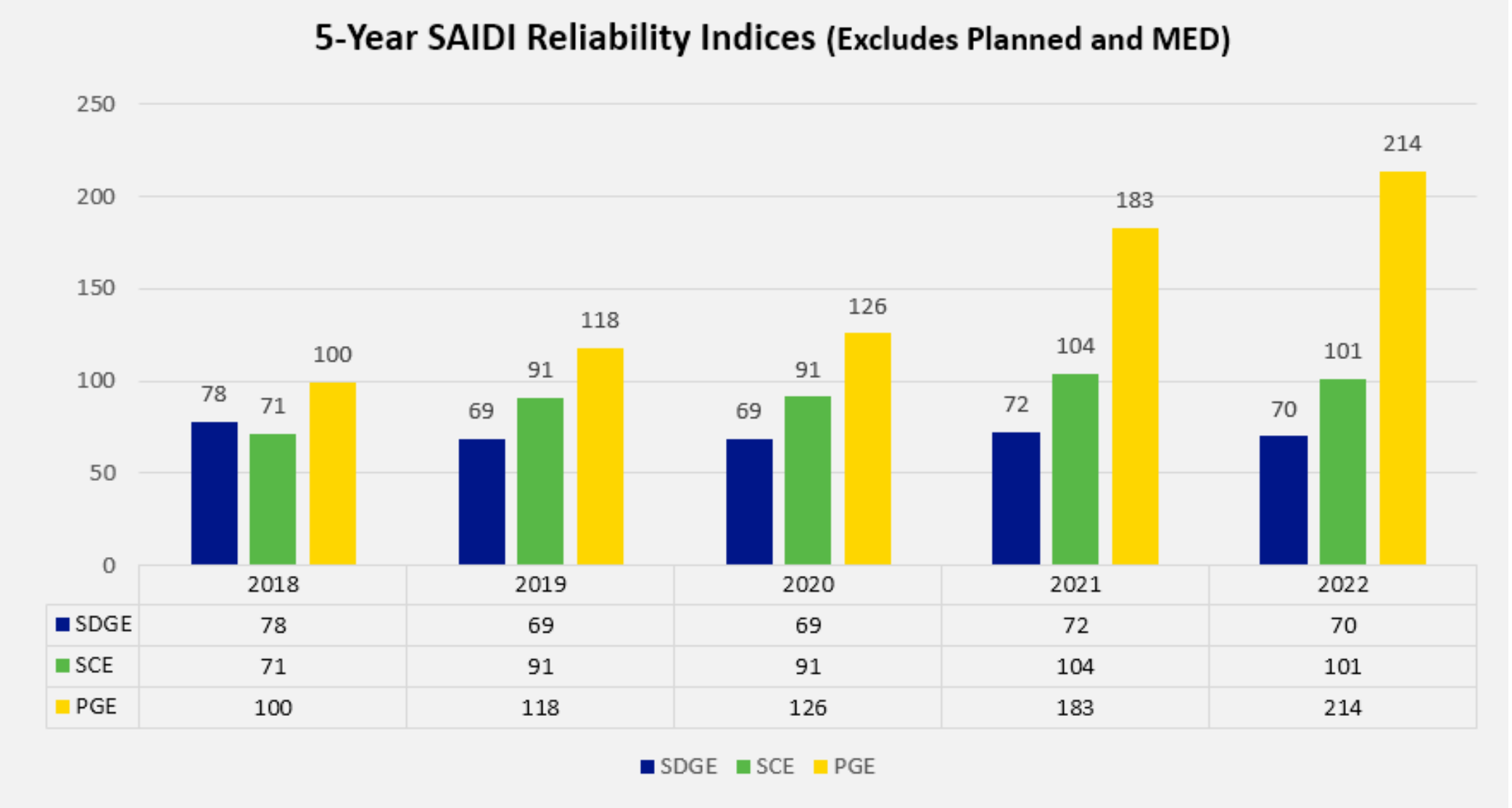
Awards & Recognition

- **PA Consulting ReliabilityOne® Awards** – Leader in Energy and Utilities Consultations
  - Outstanding Reliability "Best in the West" for 18 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

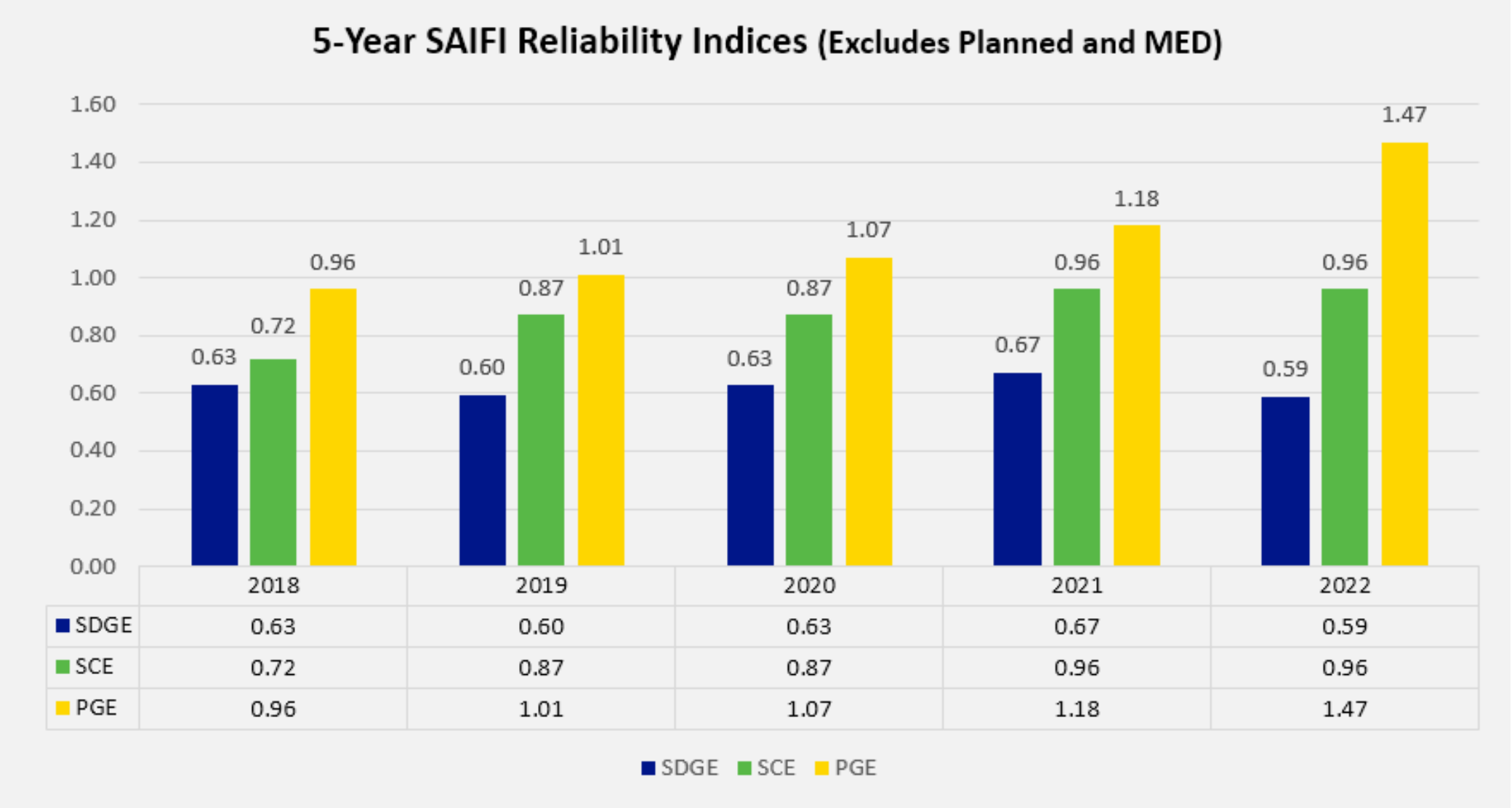
- **Edison Electric Institute** – 2018 Edison Award

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

SAIDI Comparison – Past 5 Years



SAIFI Comparison – Past 5 Years



	2018	2019	2020	2021	2022
SDGE	0.63	0.60	0.63	0.67	0.59
SCE	0.72	0.87	0.87	0.96	0.96
PGE	0.96	1.01	1.07	1.18	1.47

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 past 10 years including planned outages and 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 2013 - 2022**								
MED Included					MED Excluded			
Year	**SAIDI**	**SAIFI**	**CAIDI**	**MAIFI**	**SAIDI**	**SAIFI**	**CAIDI**	**MAIFI**
2013	75.03	0.561	133.84	0.211	59.96	0.472	127.03	0.211
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

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 2-2: Eastern – District Reliability Indices

	MED Included					MED Excluded			
Year	SAIDI	SAIFI	CAIDI	MAIFI		SAIDI	SAIFI	CAIDI	MAIFI
2013	78.39	0.643	121.93	0.223		77.04	0.634	121.58	0.223
2014	91.73	0.574	159.75	0.243		77.80	0.528	147.39	0.238
2015	50.17	0.461	108.79	0.263		50.17	0.461	108.79	0.263
2016	108.24	0.820	132.06	0.326		84.93	0.705	120.41	0.292
2017	177.22	0.637	278.38	0.358		83.72	0.529	158.23	0.322
2018	203.88	0.688	296.39	0.362		108.94	0.654	166.62	0.362
2019	208.02	0.599	347.49	0.288		64.70	0.513	126.02	0.288
2020	400.19	0.888	450.66	0.364		103.07	0.695	148.40	0.355
2021	113.30	0.645	175.64	0.585		84.69	0.623	135.86	0.585
2022	83.08	0.710	116.94	0.413		83.08	0.710	116.94	0.413

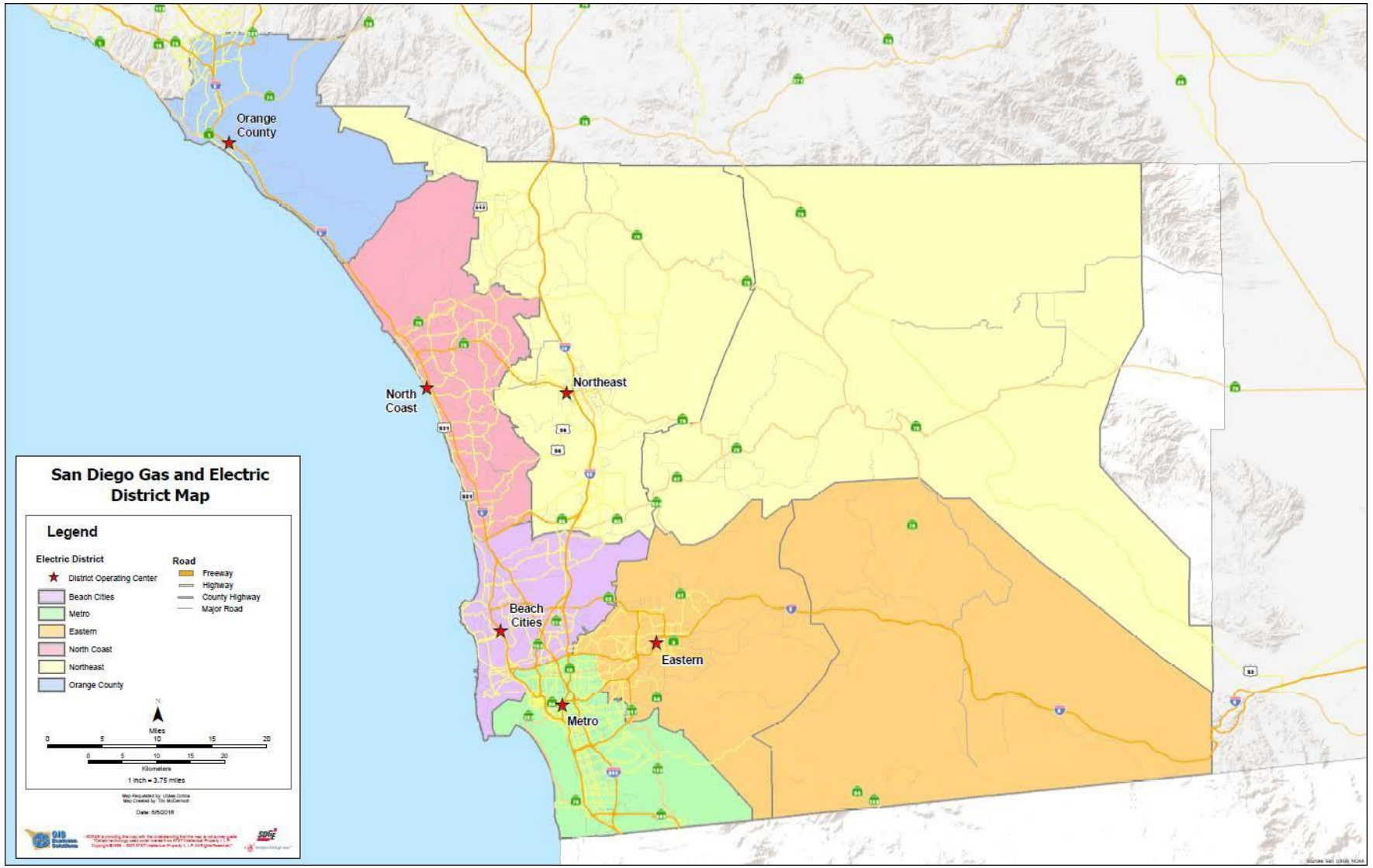
Section 3 – System & District Indices for the Past 10 Years, Including Planned Outages

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 currently available
- Thousands of upgrades performed annually to improve service

System Indices (2013 – 2022) Planned and Unplanned								
	MED Included				MED Excluded			
Year	SAIDI	SAIFI	CAIDI	MAIFI	SAIDI	SAIFI	CAIDI	MAIFI
2013	106.19	0.668	158.96	0.230	91.09	0.579	157.25	0.230
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	170.71	0.339	137.61	0.806	170.71	0.339

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: Worst SAIDI Circuits based on 2021-2022 data (Excludes Planned and MED)

Circuit	District	Circuit Customers	Substation Name	Circuit Miles	% OH	% UG	Annualized Feeder Outage Count	Annualized Total Circuit SAIDI **
*445	Eastern	970	BOULEVARD EAST	110.7	93%	7%	7	1645
CCB1	Beach Cities	171	COUNTRY CLUB	3.3	3%	97%	2	1311
CTL1	Northeast	200	CRESTLINE	5.8	69%	31%	5	828
RA3	Northeast	368	RAMONA	3.6	82%	18%	5	785
*220	Northeast	328	SANTA YSABEL	54.0	95%	5%	2	739
CHA1	Eastern	190	CHALLENGE	2.4	100%	0%	2	737
1233	Northeast	293	PALA	28.2	95%	5%	2	734
212	Northeast	630	WARNERS	113.2	96%	4%	6	726
*217	Northeast	1,170	RINCON	84.7	83%	17%	2	639
442	Eastern	1,127	GLENCLIFF	58.7	66%	34%	6	634

** Circuit appeared on previous years worst performance list*
*** Circuit SAIDI represents all outages: Feeder and Branch*

Section 6 – Top 10 Major Unplanned Outages in 2022

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	12/25/2022	Fire	BC	33,278	0.77	0.022
2	11/3/2022	Tee Connector	OC	18,295	0.79	0.012
3	8/24/2022	Bird Contact	EA	14,003	0.74	0.009
4	9/3/2022	Severe Weather / Heat	BC, CM, EA, NC, NE	13,707	1.95	0.009
5	8/20/2022	Vehicle Contact	OC	8,997	0.09	0.006
6	12/6/2022	Substation Breaker	NE	8,512	0.12	0.006
7	11/19/2022	Arrestor	NC, NE	8,060	0.11	0.005
8	6/29/2022	Balloon Contact	EA	7,747	0.36	0.005
9	8/9/2022	Tee Connector	BC	7,578	0.20	0.005
10	7/18/2022	Tee Connector	CM	7,344	0.49	0.005

Section 7 – Summary List of 2022 Major Event Days (MED)

- SDG&E did not experience any Major Event Days (MED) in 2022
- Last time this occurred was in 2012

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

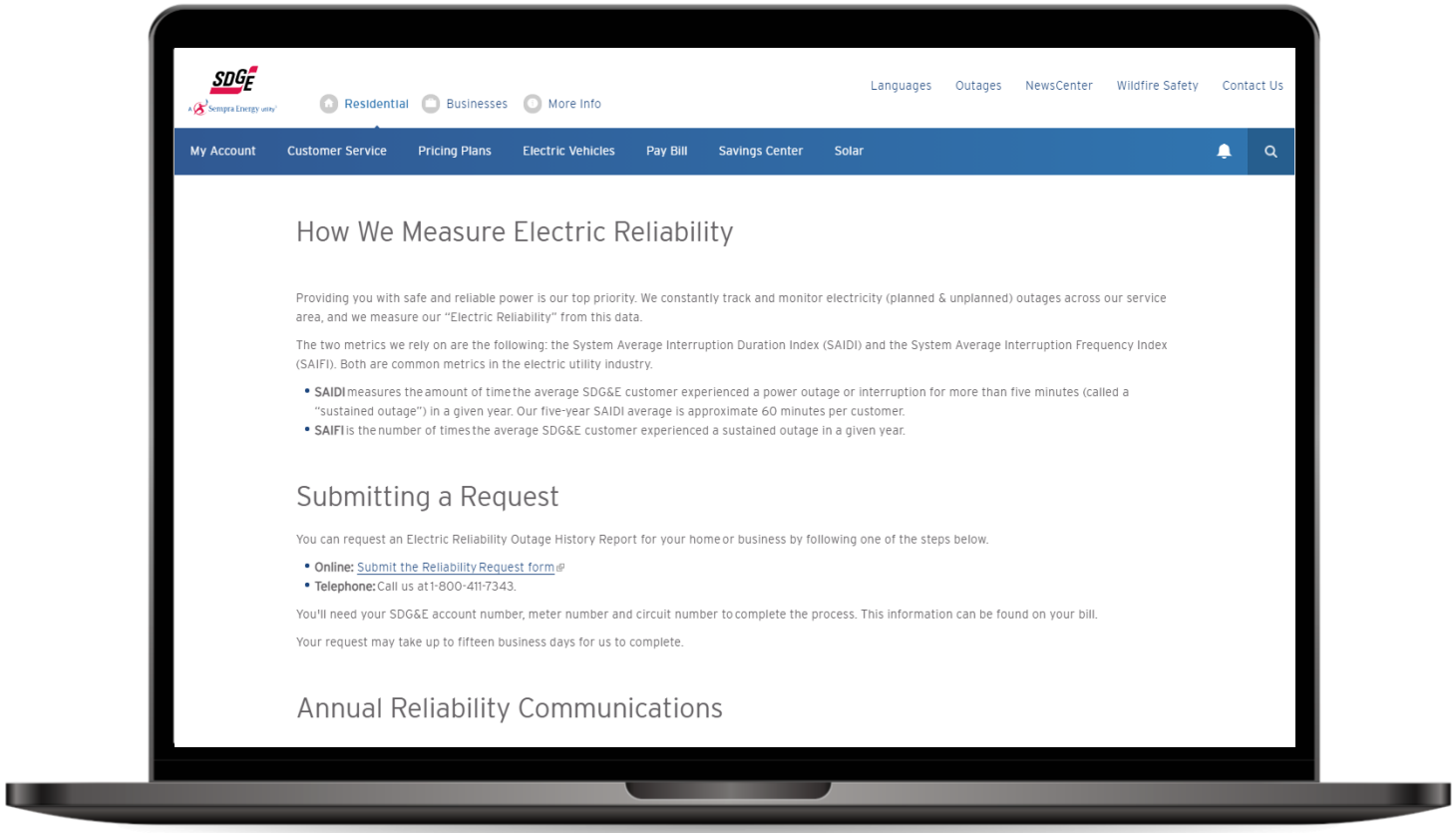
Displays the ten largest unplanned outage events for each of the years from 2013-2022
- Based upon SAIDI impact

Historical 10 Largest Unplanned Outage Events				
Rank	Date	SAIDI	SAIFI	Description
1	9/3/2022	1.95	0.009	Severe Weather / Heat
2	4/12/2022	1.44	0.003	Tee Connector
3	8/27/2022	0.90	0.003	Tee Connector
4	8/23/2022	0.83	0.004	Vehicle Contact
5	10/9/2022	0.79	0.004	UG Cable Failure
6	11/3/2022	0.79	0.012	Tee Connector
7	5/21/2022	0.78	0.004	UG Cable Failure
8	2/4/2022	0.78	0.003	UG Cable Failure
9	12/25/2022	0.77	0.022	Fire
10	11/17/2022	0.75	0.002	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

Twitter.com/sdge

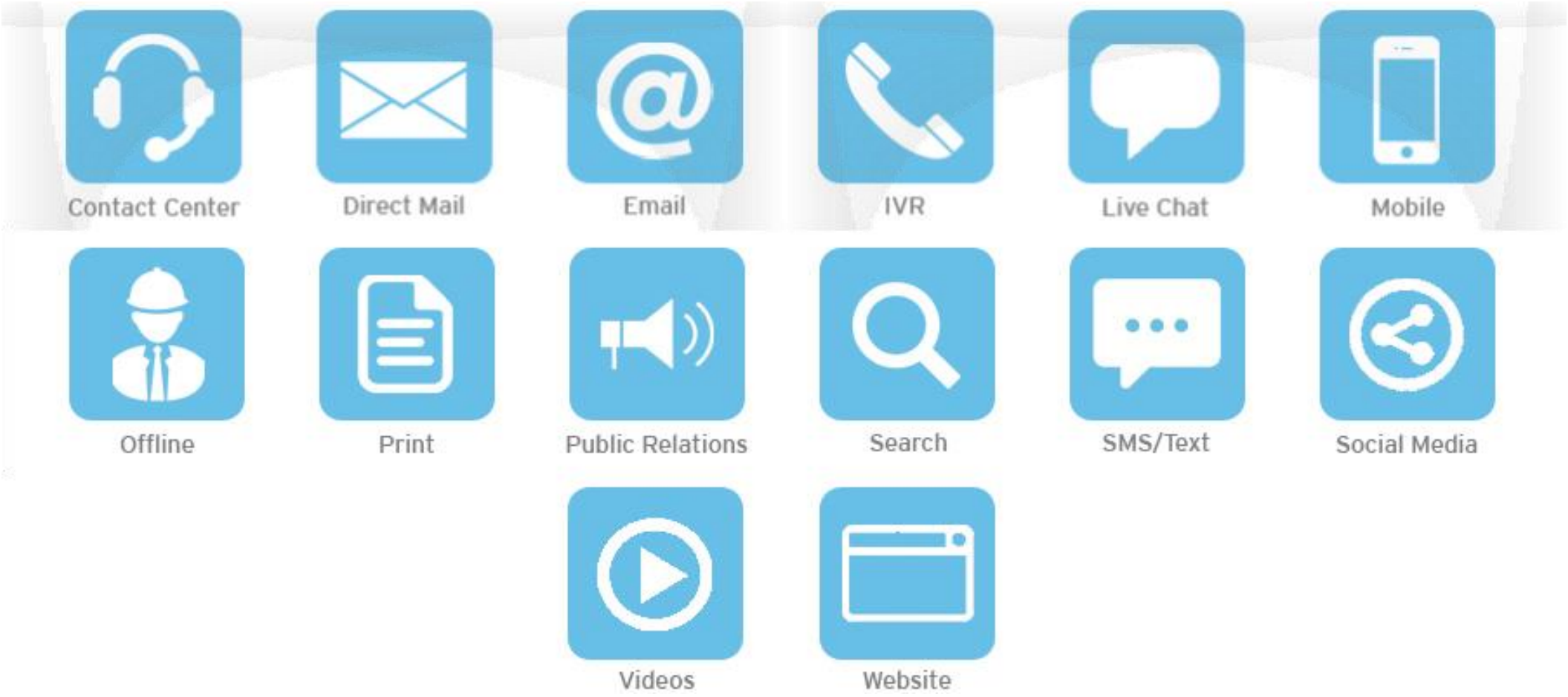
Facebook.com/SanDiegoGasandElectric

Instagram.com/sdge

YouTube.com/SDGEWebmaster

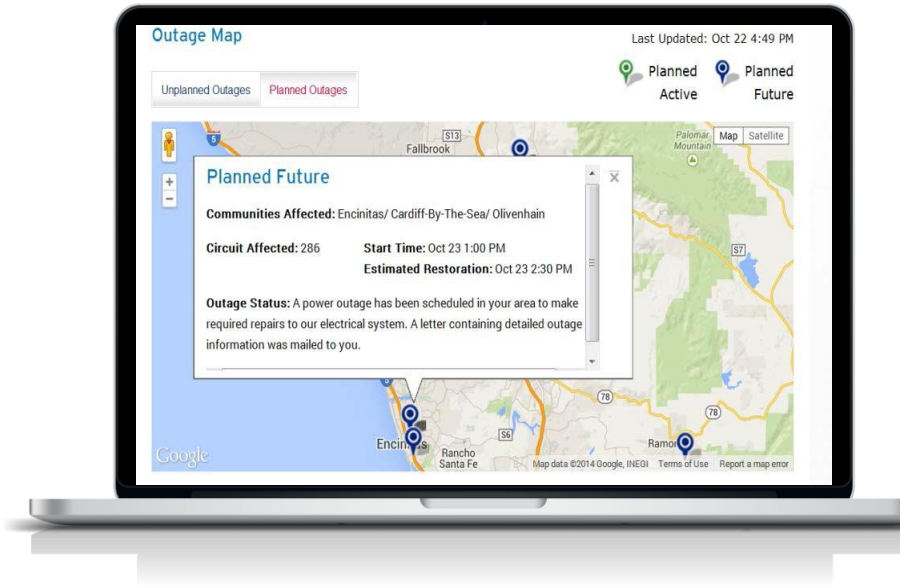
LinkedIn.com/company/san-diego-gas-&-electric

Customer Engagement Channels

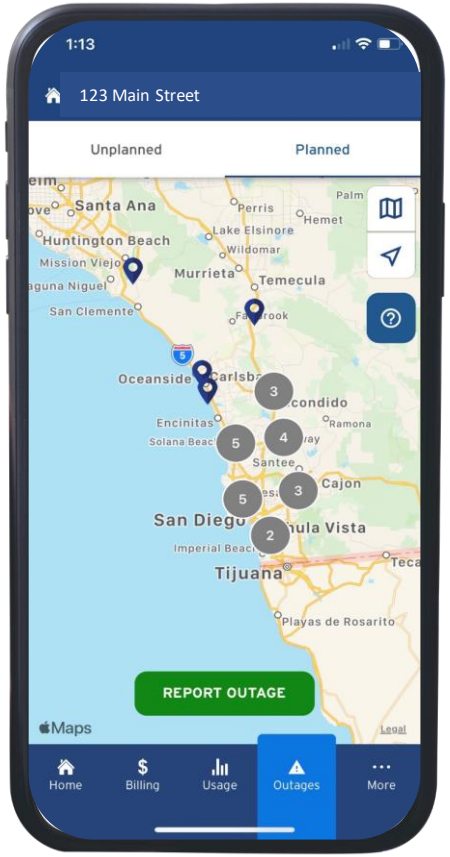


Customer Outage Tools

Outage Map



Mobile App



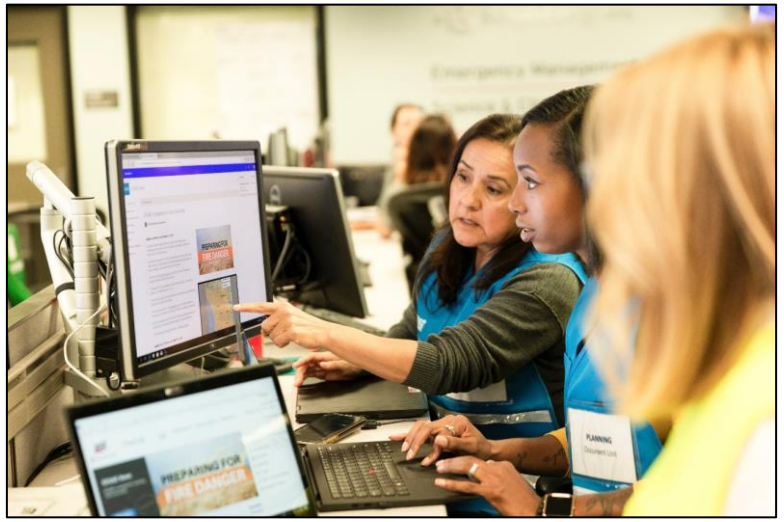
Outage Video

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 2022 Annual Report available on
  - cpuc.ca.gov
  - sdge.com/system-reliability
- Social Media
- Customer Engagement Channels
- Customer Outage Tools

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Thank You