

# High Grade Utilities & Power

## 2023 California Wildfire season: Mildest in years

Industry Overview

### 2023 wildfire season was the mildest in years

The 2023 California wildfire season was one of the mildest in recent years both in terms of total acreage burnt and property destruction. Overall, wildfires burnt ~325k acres in 2023, lower than the ~365k acres scorched in 2022, and substantially below the 1.5mn acres median over 2016-22. Fires this past year also caused a lot less destruction with “just” 71 structures destroyed vs. a median 3,500+ over 2016-22. While the cause of many fires remains under investigation, we note some of the largest fires of 2023 were started by lightning, with no utility equipment involvement confirmed as of now. We think the combination of heavy rains early in the year and lower summer temperatures drove overall moisture up and contributed to lower ignition and spread of wildfires. Overall, we think the 2023 season continues to build the California utilities’ track record of managing wildfires, representing now the fifth season in a row with manageable utility-caused damages since the 2017/18 fires that caused PG&E’s bankruptcy.

### Expecting Moody’s to upgrade PG&E in the near term

As a result of yet another moderate wildfire season, we expect Moody’s to upgrade Pacific Gas & Electric (PG&E) by one notch. We note the rating agency has had the name on positive outlook since last Feb; we think all the conditions for an upgrade are met and we expect Moody’s to upgrade both the HoldCo and OpCo in the near term. We note that with the Moody’s upgrade, the PG&E FMBs will have a median rating of mid-BBB. We think it’ll take another manageable wildfire season for the two other rating agencies to be comfortable with an upgrade – Fitch because it was a first mover and already rated the name one notch higher, and S&P because the agency has been slower to react and just recently revised the outlook to positive last Dec. We rate the PG&E bonds under coverage Overweight.

25 January 2024

High Grade Credit  
United States  
Electric Utilities

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#### Abbreviations:

CPUC: California Public Utility  
Commission

FMB: First Mortgage Bond

IOU: Investor-Owned Utility

PDSI: Palmer Drought Severity Index

PG&E: Pacific Gas & Electric

PSPS: Public Safety Power Shutoff

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Refer to important disclosures on page 9 to 11. Analyst Certification on page 8. Valuation & Risk on page 8.

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Timestamp: 25 January 2024 07:00AM EST

## 2023 was the mildest wildfire season in years

The 2023 California wildfire season was the mildest in recent history. Overall, wildfires burnt ~325k acres in 2023, vs. ~4mn and ~2.5mn acres in 2020 and 2021, respectively. Fires last year also caused a lot less destruction with “just” 71 structures destroyed, vs. a median 3,500+ over 2016-22. We think this was helped by weather, as the combination of heavy rains early in the year and lower summer temperatures drove overall moisture up and contributed to lower ignition and spread of wildfires.

### Exhibit 1: 2023 wildfire season: Comparison to prior years

2023 was the mildest season in years

Fire Season	Total # of Incidents	# of Fires > 1k Acres	# of Fires > 10k Acres	Total Acreage Burnt	Total # of Structures Destroyed	Total # of Fatalities
2016	6,954	43	9	669,534	1,274	6
2017	9,270	77	26	1,548,429	10,868	47
2018	7,948	51	19	1,963,101	24,226	100
2019	7,148	34	4	259,823	732	3
2020	8,648	66	28	4,257,863	11,116	33
2021	7,396	34	16	2,569,386	3,560	3
2022	7,477	19	6	331,360	772	9
<b>Median '16-22</b>	<b>7,477</b>	<b>43</b>	<b>16</b>	<b>1,548,429</b>	<b>3,560</b>	<b>9</b>
<b>2023</b>	<b>7,127</b>	<b>16</b>	<b>4</b>	<b>324,917</b>	<b>71</b>	<b>4</b>
2023 as a % of Median '16-22		37%	25%	21%	2%	44%

Source: Cal Fire, BofA Global Research estimates

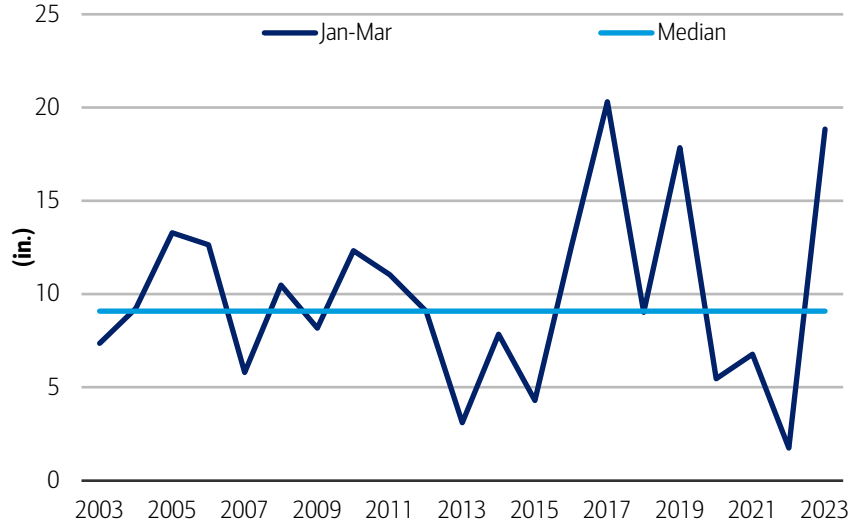
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### Above-average precipitation earlier in the year

Cumulative precipitation amounted to 18.84 inches in 1Q23, more than double the median nine inches over the past 20 years.

### Exhibit 2: Cumulative precipitation in California during the first quarter

1Q23 saw above-average precipitation in California



Source: NOAA

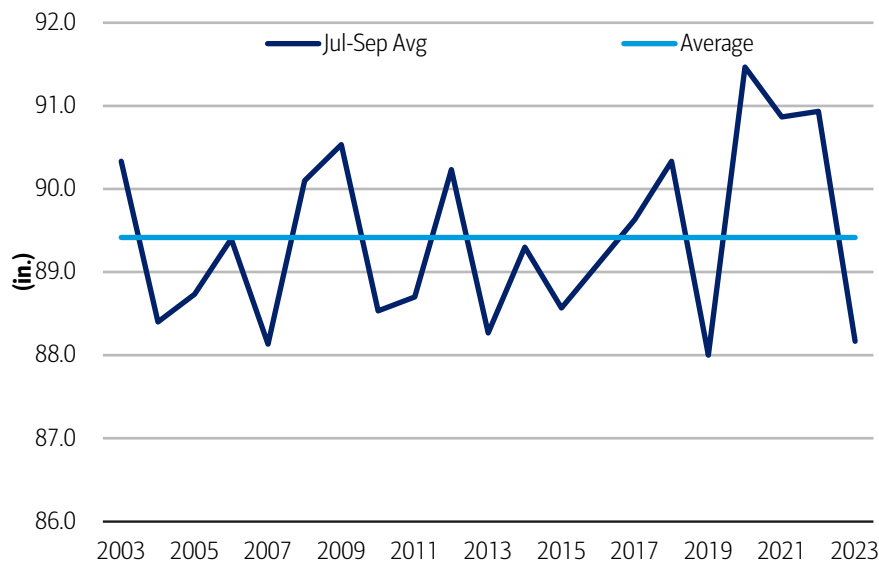
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### Lower max temperature during the summer

Additionally, the weather this past summer was milder than usual, with max temperatures of ~88 degrees on average over Jul-Sep, or ~1.5 degrees lower than the average max temperature over the past 20 years.

#### Exhibit 3: Historical average maximum temperature in the summer

Lower max temperature during the summer



Source: NOAA

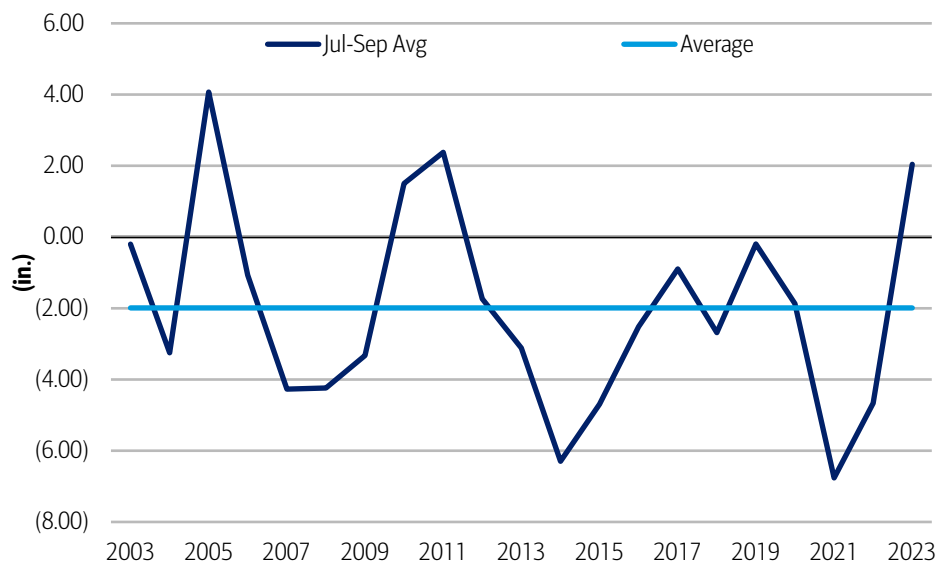
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### Lower relative dryness during the summer

These factors contributed to lower relative dryness as shown by an average PDSI of +2.00 in summer 2023, vs. an historical average of -2.00. A positive PDSI indicates conditions that are relatively wetter, while a negative number shows relative dryness.

#### Exhibit 4: Historical PDSI average in the summer

Lower relative dryness this past summer



Source: NOAA

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### August saw the most burning

The season kickstarted with a mild July in terms of acreage burn yet the number of structures destroyed/damaged came in well above the historical median of 192 at nearly 430 structures impacted. Contrary to prior seasons, August was a relatively quiet month, as most of the normal late season pick-up in wildfire activity was pushed to Sept.

#### Exhibit 5: Acreage burnt by major fires

2023 acreage burnt was similar to 2022 and well-below historical median

Fire	Acreage Burnt (000s)							Total	% of
Season	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jun-Dec	Media n
2016	91	146	237	30	11	5	0	519	51%
2017	30	595	304	53	238	0	308	1,526	149%
2018	141	927	162	79	8	256	0	1,574	154%
2019	12	15	11	95	113	6	0	252	25%
2020	17	193	2,948	865	26	0	10	4,060	397%
2021	62	1,701	505	151	17	0	0	2,436	238%
2022	3	90	69	130	0	0	0	292	29%
2023	1	12	282	0	2	0	3	300	29%
<b>Median</b>	<b>23</b>	<b>170</b>	<b>260</b>	<b>87</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>1,022</b>	

Source: BofA Global Research estimates, Cal Fire

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#### Exhibit 6: Structures impacted by major fires (destroyed and damaged)

Structures impacted in 2023 were the lowest in recent years

Fire	Structures Impacted							Total	% of
Season	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jun-Dec	Median
2016	325	77	761	40	0	0	0	1,203	54%
2017	4	337	74	14	9,591	0	1,636	11,656	524%
2018	69	2,078	73	20	4	20,796	0	23,040	1036%
2019	7	0	1	4	687	0	0	699	31%
2020	6	37	6,715	3,555	25	0	52	10,390	467%
2021	15	1,538	1,430	262	0	0	0	3,245	146%
2022	1	429	21	311	0	0	0	762	34%
2023	4	5	19	0	20	0	0	48	2%
<b>Median</b>	<b>7</b>	<b>207</b>	<b>74</b>	<b>30</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>2,224</b>	

Source: BofA Global Research estimates, Cal Fire

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### Burn occurred mainly in PacifiCorp and SCE's service territories

The 16 major fires we reviewed (either 1,000+ acres burnt or known property destruction) caused ~300k acres to burn (92% of total burn for the full year). Roughly one-third of the burn was in respective PacifiCorp and SoCalEd service territories.

#### Exhibit 7: Major 2023 wildfires by utility service territory

PacifiCorp and SCE's service territory saw the most damage in 2023

IOU Service Territory	# of Fires > 1k Acres	Total Acres Burnt	Structures		Total	Injuries	Fatalities
			Destroyed	Damaged			
PG&E	3	59,656	4	0	4	0	0
TPUD	1	4,198	0	0	0	0	0
PacifiCorp	2	116,832	9	2	11	0	0
SCE	7	113,172	8	2	10	1	0
SDG&E	1	3,137	15	7	22	3	0
Other	2	3,410	1	0	1	1	0
<b>Total</b>	<b>16</b>	<b>300,405</b>	<b>37</b>	<b>11</b>	<b>48</b>	<b>5</b>	<b>0</b>

Source: Cal Fire

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### No indication of utility involvement thus far

Of the 16 major fires we reviewed, the cause of six was determined to be lightning, while the cause of the other fires was still under investigation. At this point, there was no indication that utility equipment caused a major fire in 2023.

#### Exhibit 8: Major 2023 wildfires by cause

Lightning was the leading fire cause in 2023

Fire Cause	# of Fires > 1k Acres	Total Acres Burnt	Structures		Total	Injuries	Fatalities
			Destroyed	Damaged			
Lightning	6	183,440	9	2	11	1	0
Under investigation	10	116,965	28	9	37	4	0
Unknown	0	0	0	0	0	0	0
Vehicle	0	0	0	0	0	0	0
Arson	0	0	0	0	0	0	0
<b>Total</b>	<b>16</b>	<b>300,405</b>	<b>37</b>	<b>11</b>	<b>48</b>	<b>5</b>	<b>0</b>

Source: Cal Fire

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## Another year of mild PSPS use

Like 2022, IOUs continued to make progress last year in terms of how PSPS impacts their customer bases, although the milder season certainly helped. We note PG&E had just two de-energization events this past year that impacted a minimal portion of their customer base.

### Exhibit 9: PSPS summary

Another year of mild PSPS use

PG&E						
	2018	2019	2020	2021	2022	2023
# of PSPS Events	1	7	6	5	0	2
Average # of Customers Impacted	60,086	285,602	107,783	16,078	n/a	2,550
% of Customer Base	1.1%	5.2%	2.0%	0.3%	n/a	0.0%
Weighted Average Outage Hours/Customer	28.2	56.0	40.3	36.0	n/a	21.7
SCE						
	2018	2019	2020	2021	2022	2023
# of PSPS Events	0	6	10	6	3	5
Average # of Customers Impacted	n/a	25,375	22,773	33,363	5,259	6,788
% of Customer Base	n/a	0.5%	0.4%	0.6%	0.1%	0.1%
Weighted Average Outage Hours/Customer	n/a	27.3	19.8	41.9	8.9	15.3
SDG&E						
	2018	2019	2020	2021	2022	2023
# of PSPS Events	2	3	5	1	0	0
Average # of Customers Impacted	12,230	16,004	20,145	5,858	n/a	n/a
% of Customer Base	0.8%	1.1%	1.4%	0.4%	n/a	n/a
Weighted Average Outage Hours/Customer	49.1	27.4	30.0	25.2	n/a	n/a

Source: BofA Global Research estimates, CPUC

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## Appendix

### List of major wildfires in 2023 season

#### Exhibit 10: List of major wildfires in the 2023 season

List of major wildfires in the 2023 season

2023 Fires	IOU Service Territory	Start Date	End Date	Acres Burnt	Cause	Structures		Total	Injuries	Fatalities
						Destroyed	Damaged			
Smith River Complex	PacifiCorp	8/15/23	8/30/23	95,107	Lightning			0		
York Fire	SCE	8/1/23	8/19/23	93,078	Under Investigation			0		
SRF Lightning Complex	PG&E	8/20/23	10/29/23	50,198	Lightning			0		
Happy Camp Complex	PacifiCorp	8/16/23	10/31/23	21,725	Lightning	9	2	11		
Rabbit Fire	SCE	7/14/23	7/22/23	8,283	Lightning			0	1	
Plant Fire	PG&E	8/19/23	8/30/23	5,464	Under Investigation			0		
Almond Fire	SCE	8/6/23	8/7/23	5,229	Under Investigation			0		
Deep Fire	TPUD	8/16/23	9/3/23	4,198	Lightning			0		
South Fork Complex	PG&E	8/15/23	11/1/23	3,929	Lightning			0		
South Fire	SCE	12/9/23	12/12/23	2,715	Under Investigation			0		
Highland Fire	SDG&E	10/30/23	11/7/23	2,487	Under Investigation	13	7	20	2	
Bonny Fire	Other	7/27/23	8/7/23	2,322	Under Investigation	1		1	1	
East Fire	SCE	8/1/23	8/2/23	1,540	Under Investigation			0		
No Name Fire	SCE	8/5/23	8/19/23	1,120	Under Investigation			0		
Geology Fire	Other	6/10/23	6/16/23	1,088	Under Investigation			0		
District Fire	SCE	7/7/23	7/11/23	1,044	Under Investigation			0		
Coyote Fire	SDG&E	8/17/23	8/20/23	466	Under Investigation	2		2		
Bunnie Fire	SDG&E	8/9/23	8/11/23	184	Under Investigation			0	1	
Almond Fire	SCE	8/2/23	8/2/23	95	Under Investigation	4	2	6		
Juniper Fire	SCE	6/27/23	6/29/23	68	Under Investigation	4		4		

**Exhibit 10: List of major wildfires in the 2023 season**

List of major wildfires in the 2023 season

Turkey Fire	PG&E	7/26/23	8/3/23	65	Under Investigation	4		4	
Other Fires Less than 1,000 Acres				24,512		30	4	34	4
<b>Total</b>				<b>324,917</b>		<b>58</b>	<b>13</b>	<b>71</b>	<b>5</b>

Source: Cal Fire

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**List of PSPS events since 2018****Exhibit 11: List of PSPS events since 2018 (Through December 2023) – 1/2**

PG&amp;E had two PSPS events in 2023, affecting only a small fraction of its customer base

Company	Start Date	End Date	Number of Days	Total Customers Impacted	% of Total Cust.	Aggregate Outage Hours	Average Outage Hours/Customer
PG&E	14-Oct-18	17-Oct-18	4	60,086	1.1%	1,693,466	28
PG&E	8-Jun-19	9-Jun-19	2	22,327	0.4%	367,398	16
PG&E	23-Sep-19	26-Sep-19	4	69,627	1.3%	1,220,165	18
PG&E	5-Oct-19	6-Oct-19	2	11,304	0.2%	169,572	15
PG&E	9-Oct-19	12-Oct-19	4	728,980	13.3%	34,258,756	47
PG&E	23-Oct-19	25-Oct-19	3	176,620	3.2%	5,389,188	31
PG&E	26-Oct-19	31-Oct-19	6	941,269	17.1%	69,114,411	73
PG&E	20-Nov-19	21-Nov-19	2	49,086	0.9%	1,373,794	28
PG&E	7-Sep-20	10-Sep-20	4	165,593	3.0%	7,185,409	43
PG&E	26-Sep-20	29-Sep-20	4	64,295	1.2%	1,728,793	27
PG&E	14-Oct-20	17-Oct-20	4	40,573	0.7%	1,621,036	40
PG&E	21-Oct-20	23-Oct-20	3	30,153	0.5%	692,281	23
PG&E	25-Oct-20	28-Oct-20	4	345,469	6.3%	14,799,668	43
PG&E	2-Dec-20	3-Dec-20	2	617	0.0%	12,885	21
PG&E	18-Jan-21	20-Jan-21	3	5,099	0.1%	372,610	73
PG&E	17-Aug-21	19-Aug-21	3	48,155	0.9%	1,702,687	35
PG&E	20-Sep-21	21-Sep-21	2	2,968	0.1%	41,861	14
PG&E	11-Oct-21	14-Oct-21	4	23,504	0.4%	754,940	32
PG&E	15-Oct-21	16-Oct-21	2	666	0.0%	24,454	37
PG&E	30-Aug-23	31-Aug-23	2	3,928	0.1%	91,285	23
PG&E	20-Sep-23	21-Sep-23	2	1,171	0.0%	19,338	17
SCE	24-Sep-19	24-Sep-19	1	85	0.0%	493	6
SCE	9-Oct-19	12-Oct-19	4	24,113	0.5%	644,727	27
SCE	16-Oct-19	21-Oct-19	6	440	0.0%	6,863	16
SCE	26-Oct-19	3-Nov-19	9	126,373	2.4%	3,489,491	28
SCE	17-Nov-19	17-Nov-19	1	49	0.0%	230	5
SCE	25-Nov-19	27-Nov-19	3	1,192	0.0%	14,721	12
SCE	2-Aug-20	4-Aug-20	3	17	0.0%	753	44
SCE	9-Sep-20	11-Sep-20	3	301	0.0%	3,417	11
SCE	16-Oct-20	16-Oct-20	1	86	0.0%	581	7
SCE	26-Oct-20	28-Oct-20	3	36,257	0.7%	769,084	21
SCE	6-Nov-20	7-Nov-20	2	1,327	0.0%	9,306	7
SCE	16-Nov-20	18-Nov-20	3	506	0.0%	7,101	14
SCE	26-Nov-20	28-Nov-20	3	20,619	0.4%	287,503	14
SCE	2-Dec-20	4-Dec-20	3	64,111	1.2%	1,068,089	17
SCE	7-Dec-20	9-Dec-20	3	78,997	1.5%	1,933,089	24
SCE	23-Dec-20	24-Dec-20	2	25,513	0.5%	426,888	17
SCE	14-Jan-21	21-Jan-21	8	116,234	2.2%	6,150,962	53
SCE	13-Apr-21	13-Apr-21	1	78	0.0%	224	3

**Exhibit 11: List of PSPS events since 2018 (Through December 2023) – 1/2**

PG&E had two PSPS events in 2023, affecting only a small fraction of its customer base

SCE	30-Sep-21	30-Sep-21	1	9	0.0%	88	10
SCE	11-Oct-21	16-Oct-21	6	107	0.0%	2,076	19
SCE	21-Nov-21	22-Nov-21	2	5,235	0.1%	73,360	14
SCE	24-Nov-21	26-Nov-21	3	78,514	1.5%	2,162,200	28
SCE	22-Jul-22	23-Jul-22	2	209	0.0%	5,291	25
SCE	19-Nov-22	19-Nov-22	1	5,373	0.1%	39,500	7
SCE	24-Nov-22	25-Nov-22	2	10,195	0.2%	95,424	9
SCE	11-Jul-23	13-Jul-23	3	5	0.0%	189	38
SCE	29-Oct-23	2-Nov-23	5	25,504	0.5%	375,592	15
SCE	9-Nov-23	10-Nov-23	2	338	0.0%	5,128	15
SCE	11-Nov-23	12-Nov-23	2	2,780	0.1%	49,246	18
SCE	9-Dec-23	11-Dec-23	3	5,311	0.1%	90,303	17

Source: BofA Global Research estimates, CPUC

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**Exhibit 12: List of PSPS events since 2018 (Through December 2023) – 2/2**

SDG&E did not resort to PSPS in either 2022 or 2023

Company	Start Date	End Date	Number of Days	Total Customers Impacted	% of Total Cust.	Aggregate Outage Hours	Average Outage Hours/Customer
SDG&E	15-Oct-18	17-Oct-18	3	379	0.0%	2,767	7
SDG&E	11-Nov-18	16-Nov-18	6	24,081	1.7%	1,197,103	50
SDG&E	10-Oct-19	12-Oct-19	3	395	0.0%	8,107	21
SDG&E	24-Oct-19	26-Oct-19	3	20,621	1.4%	575,022	28
SDG&E	28-Oct-19	1-Nov-19	5	26,995	1.9%	730,765	27
SDG&E	8-Sep-20	10-Sep-20	3	49	0.0%	359	7
SDG&E	26-Oct-20	27-Oct-20	2	4,373	0.3%	31,391	7
SDG&E	2-Dec-20	4-Dec-20	3	73,977	5.1%	2,416,516	33
SDG&E	7-Dec-20	9-Dec-20	3	15,528	1.1%	492,040	32
SDG&E	23-Dec-20	24-Dec-20	2	6,797	0.5%	85,574	13
SDG&E	24-Nov-21	26-Nov-21	3	5,858	0.4%	147,767	25

Source: BofA Global Research estimates, CPUC

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## Valuation & risk

### Pacific Gas (PCG)

PG&E has made substantial and consistent progress mitigating wildfire exposure as exemplified by the now three seasons in a row with manageable utility-caused damages. The company is also taking steps to implement its ambitious undergrounding program, which we expect will dramatically reduce the company's business risk profile in the medium-term. While the upcoming wildfire season could put pressure on the name, we emphasize the bonds have already underperformed the index due to higher beta and we see the bonds attractively priced, particularly as we believe the low dollar price and first lien security somewhat mitigates downside risk. We expect positive rating actions across the board should the company navigate the 2022 wildfire season with manageable utility-caused damages and successfully raises the \$7.5 Bn rate-neutral securitization bonds.

We view risks as additional large wildfires which could potentially increase PG&E's liabilities and lead to a faster-than-anticipated exhaustion of the AB1054 wildfire fund, as well as political risks including less favorable regulatory treatment from the CPUC.

### Analyst Certification

I, Antoine Aurimond, CFA, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.



## Security/Loan pricing

## Pacific Gas &amp; Electric / PCG

	Amt		Ratings			Yield	Spread
Security		Maturity date	Moody's/S&P/Fitch	Price	Price date	(%)	(bps)
2.1, Secured, USD, 2027:B	1,000	01-AUG-2027	Baa3/BBB-/BBB	90.04	23-Jan-2024	5.24	109
2.5, Secured, USD, 2031:B	2,000	01-FEB-2031	Baa3/BBB-/BBB	82.32	23-Jan-2024	5.58	150
3.3, Secured, USD, 2040:B	1,000	01-AUG-2040	Baa3/BBB-/BBB	72.46	23-Jan-2024	5.94	156
3.5, Secured, USD, 2050:B	1,925	01-AUG-2050	Baa3/BBB-/BBB	67.99	23-Jan-2024	5.90	142

For pricing information refer to "Other Important Disclosures" below.

B=Bond; L=Loan; CS=Capital Security (Not including Equity Preferred); CDS=Credit Default Swap; EP=Equity Preferred

## Disclosures

### Important Disclosures

## Credit opinion history

## Pacific Gas &amp; Electric / PCG

Company	Date <sup>R1</sup>	Action	Recommendation	
Pacific Gas & Electric / PCG	31-Dec-2020		Overweight	
	18-May-2021	Downgrade	Marketweight	
	29-Sep-2021	Upgrade	Overweight	
Security	Date <sup>R1</sup>	Action	Recommendation	Price
2.1, Secured, USD, 2027:B	31-Dec-2022		Overweight	
2.5, Secured, USD, 2031:B	31-Dec-2022		Overweight	
3.3, Secured, USD, 2040:B	31-Dec-2022		Overweight	
3.5, Secured, USD, 2050:B	31-Dec-2022		Overweight	

Table reflects credit opinion history as of previous business day's close.<sup>R1</sup>First date of recommendation within the last 36 months, if for an issuer or within the last 12 months, if for a security or loan. The investment opinion system is contained at the end of the report under the heading "BofA Global Research Credit Opinion Key."

Pricing information in the table is provided for each action where available. In the case of bonds, loans, capital securities and equity preferreds, the price shown reflects the nominal cash price for the security; and in the case of CDS, the price shown reflects the spread, on the date of the relevant action.

B=Bond; L=Loan; CS=Capital Security (Not including Equity Preferred); EP=Equity Preferred; CDS=Credit Default Swap

### BofA Global Research Credit Opinion Key

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**Buy Protection:** Buy CDS, therefore going short credit risk.

**Neutral:** No purchase or sale of CDS is recommended.

**Sell Protection:** Sell CDS, therefore going long credit risk.

### Corporate Credit Issuer Investment Rating Distribution: Global Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R2</sup>	Count	Percent
Buy	144	37.21%	Buy	119	82.64%
Hold	193	49.87%	Hold	163	84.46%
Sell	50	12.92%	Sell	37	74.00%

<sup>R2</sup> Issuers that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only corporate credit issuer recommendations. A corporate credit issuer rated Overweight is included as a Buy, a corporate credit issuer rated Marketweight is included as a Hold, and a corporate credit issuer rated Underweight is included as a Sell.

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