

**Exh. BAE-8
Dockets UE-240006/UG-240007
Witness: Betty A. Erdahl**

**BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

AVISTA CORPORATION,

Respondent.

**DOCKETS UE-240006 & UG-240007
(Consolidated)**

EXHIBIT TO

TESTIMONY OF

BETTY A. ERDAHL

**STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION**

*S&P Global Rating, "A Storm Is Brewing: Extreme Weather Events Pressure
North American Utilities' Credit Quality", November 2023*

July 3, 2024

A Storm Is Brewing: Extreme Weather Events Pressure North American Utilities' Credit Quality

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Sector: Utilities & Power, Oil & Gas, Infrastructure & Utilities
Tags: Americas, Latin America, APAC, EMEA
Topic: Confronting Credit Headwinds, Seeking Energy & Climate Resilience

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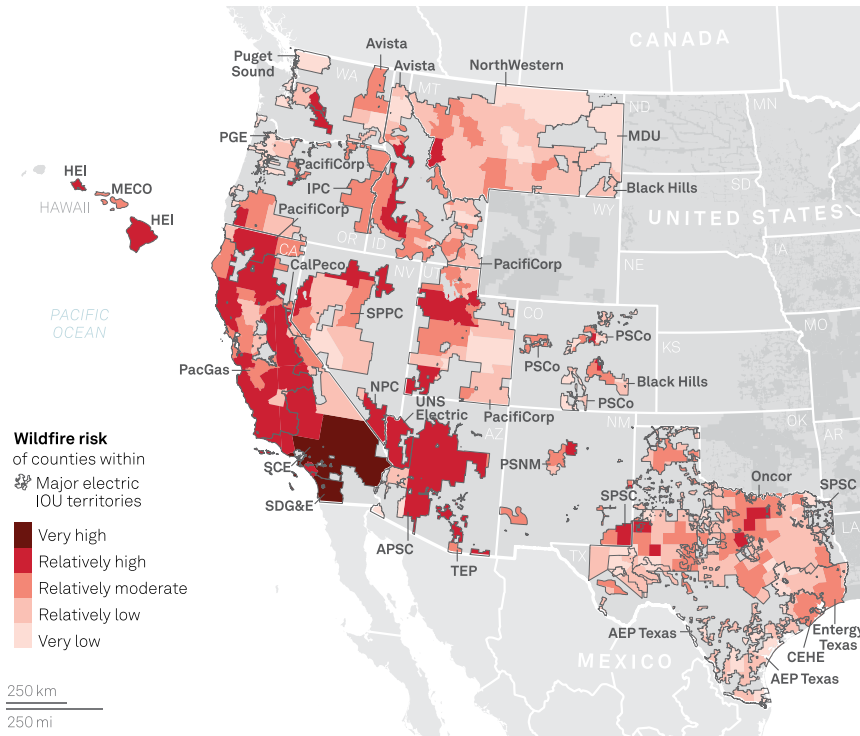
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Key Takeaways

- Climate change is increasing the frequency and severity of storms, hurricanes, wildfires, and other natural disasters, which is escalating infrastructure damage and raising credit risks for North America's investor-owned utilities (IOUs) and publicly owned utilities (POUs).
- To reduce credit risks, we expect IOUs and POUs will limit damages from physical events by leveraging already developed and in-use technologies. We also expect that IOUs will likely enhance civil litigation strategies and expand their cost-recovery capabilities.
- Over the past six years, IOU and POU downgrades directly related to physical risks have significantly increased. The credit quality of utilities with physical risk exposure could come under even more pressure if comprehensive risk-reduction strategies are not effectively implemented.

Damages and related costs from physical risks are escalating in North America as regions designated as high-fire risk expand. Climate change is increasing the frequency of extreme and devastating physical events, including hurricanes, storms, and wildfires, which is heightening risks for North America's IOUs and POUs. Warmer temperatures increase humidity, leading to stronger winds and devastating tropical storms and hurricanes. In other regions, drier and hotter weather conditions are a primary cause for more intensive and severe wildfires. As temperatures rise and the vegetation dries up, the environment becomes more susceptible to the rapid spread of wildfires. When high winds are added to this combustible environment, the probability of a catastrophic wildfire significantly escalates. As such, areas designated as high fire risk have grown across the Western U.S.

Wildfire risk across western electric service territories

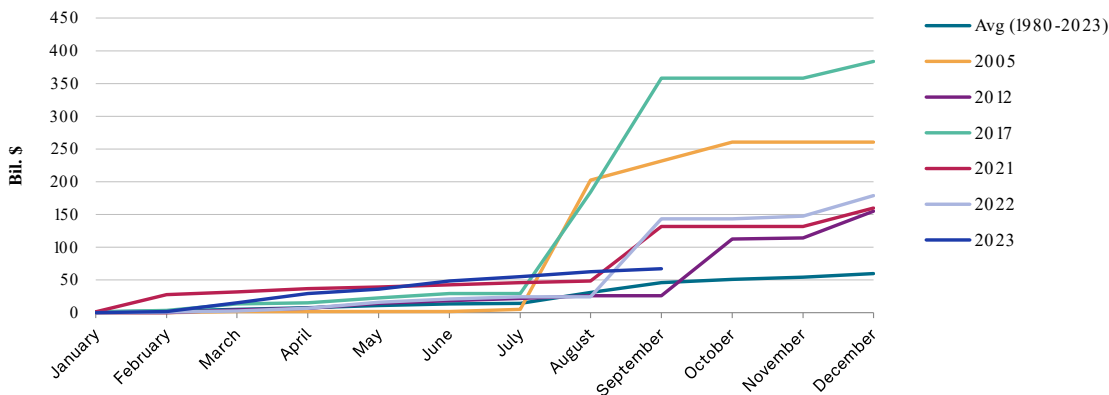


APSC--Arizona Public Service Company, CEHE--CenterPoint Energy Houston Electric, LLC, HEI--Hawaii Electric Industries, Inc. IPC--Idaho Power Company, MECO--Maui Electric Company, Ltd. NPC--Nevada Power Company. PGE--Portland General Electric Company, PSCo--Public Service Company of Colorado. PSNM--Public Service Company of New Mexico, SCE--Southern California Edison Company. SPPC--Sierra Pacific Power Company, SPSC--Southwestern Public Service Company, TEP--Tucson Electric Power Company. Source: FEMA, S&P Global Market Intelligence. Copyright © 2023 by Standard & Poor's Financial Services LLC. All rights reserved.

According to the National Oceanic and Atmospheric Administration (NOAA) on an inflation-adjusted basis, 2021 and 2022 represent two of the top five most destructive years for extreme weather events since 1980. Our base case assumes these trends will persist, magnifying physical risks for the IOU and POU industries.

Chart 1

U.S. billion dollar weather disaster year-to-date event cost (CPI-adjusted)



Source: National Oceanic and Atmospheric Administration. Copyright © 2023 by Standard & Poor's Financial Services LLC. All rights reserved.

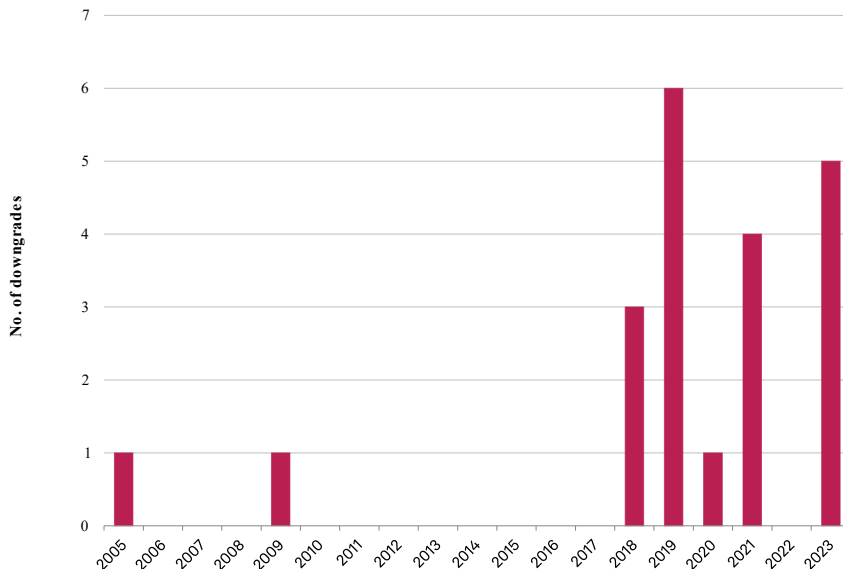
IOU And POU Downgrades Attributable To Physical Events Have Increased

S&P Global Ratings has downgraded more IOUs due to physical events (e.g., hurricanes, storms, and wildfires) over the past six years by nearly 10 times compared with the previous 13 years. From 2005-2017, we only downgraded two North American IOUs because of physical risks, but from 2018-2023 we downgraded 19. Some of the more recent devastating events have led to the latest downgrades, including the 2018 Camp Fire wildfire in California, 2021 Winter Storm Uri, 2021 Hurricane Ida, and the 2023 wildfires in Maui, Hawaii. In addition to the downgrades of PacifiCorp and Hawaii Electric Light Co. Inc. in 2023, we also revised the rating outlooks to negative on Berkshire Hathaway Energy Co. (BHE), Fortis Inc., and Public Service Co. of Colorado, a subsidiary of Xcel Energy Inc., reflecting their rising exposure to physical risks.

POUs have also been subject to an increasing number of downgrades in recent years stemming from physical risks, including actual wildfire liabilities or elevated wildfire risks, and extreme weather events. We lowered ratings on various POU's in 2019 and 2020 as a result of actual wildfire liabilities or high wildfire risks for California utilities: Trinity Public Utilities District Financing Authority, The City of Glendale's electric system, and Los Angeles Department of Water & Power (power system). Wildfire risks have also limited rating potential for newly assigned ratings in the case of two other California electric utilities the past two years. With regard to extreme weather, of particular note is Winter Storm Uri, whereby sustained extremely cold temperatures and wintry precipitation led to extremely high unbudgeted power and fuel costs resulting in reduced liquidity and higher leverage. We subsequently lowered 13 of our 27 ratings on public power and generation and transmission cooperative electric utilities within the Electric Reliability Council of Texas Inc. (ERCOT), mostly by one notch.

Chart 2

North American IOU downgrades attributed to physical risks



Source: S&P Global Ratings.
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"What We Learn From History Is That People Don't Learn From History" – Warren Buffett

In 2004, four major hurricanes hit Florida in a span of six weeks causing \$1.3 billion in IOU restoration costs alone, not including costs for POUs. In 2005, another seven major hurricanes made landfall in the Southeast U.S., resulting in an incremental \$1 billion in IOU damages. Following these events, utilities and regulators developed and adopted broad recommendations to improve vegetation management, wooden-pole replacement programs, flood monitors, communication efforts, aerial drone usage, and the burying of power lines underground, which is commonly known as undergrounding. Since 2006, Florida Power & Light Co. (FPL), a subsidiary of NextEra Energy Inc., replaced almost all of its wooden transmission structures with concrete and steel structures. Other utilities that weren't as decimated by these hurricanes took some steps to harden their systems, but none incorporated the comprehensive approach taken by FPL. For example, Tampa Electric Co. replaced over 85% of its wooden transmission structures with a goal of reaching 100% by 2029. Over the past several years, because of FPL's initiatives to reduce physical risks, it has more quickly restored electricity service to its customers following major storms or hurricanes.

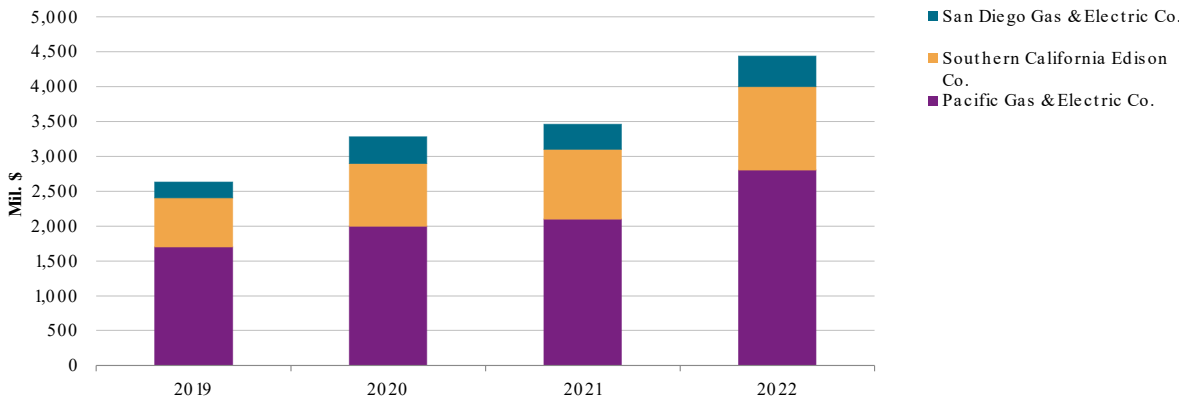
In 2007, San Diego Gas & Electric Co. (SDG&E) caused several wildfires that destroyed more than 1,100 structures, one of which, at that time, was the largest wildfire caused by a utility. Since these incidents, SDG&E implemented a comprehensive wildfire-prevention plan that helped the utility avoid causing another catastrophic wildfire. Similarly, other utilities implemented some aspects of SDG&E's wildfire-prevention plan, but only SDG&E executed such a fully comprehensive plan. These examples of physical risks typify the challenges for the utility industry. Because costly investments are needed to reduce physical risks, which then pressures the customer bill, utilities usually delay these investments until it is too late, and they are directly impacted by a physical event.

Reducing Physical Risks Before A Catastrophic Event Occurs

As climate change continued to accelerate since 2007, Central and Northern California became increasingly dry, and wildfire risks grew more severe. By 2017, Central and Northern California began to experience wildfires on a more regular basis, culminating with the 2018 Camp Fire in the city of Paradise, causing 85 fatalities and destroying more than 18,000 structures. Following this catastrophic event, all of California's IOUs and POUs were mandated to implement comprehensive wildfire mitigation plans, investing billions on system hardening and technology to reduce physical risks.

Chart 3

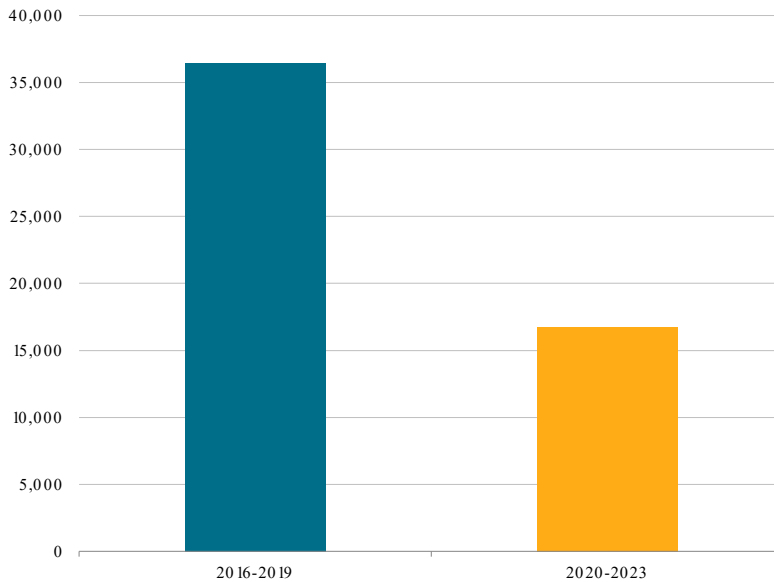
Largest California IOUs wildfire mitigation capital spending



Source: Company documents.
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The number of structures in California destroyed since 2020 has dropped by more than 50% compared to the 2016-2019 period. While weather is an important contributor to this decrease, we also believe California IOUs' and POU's investments in wildfire mitigation is a key factor.

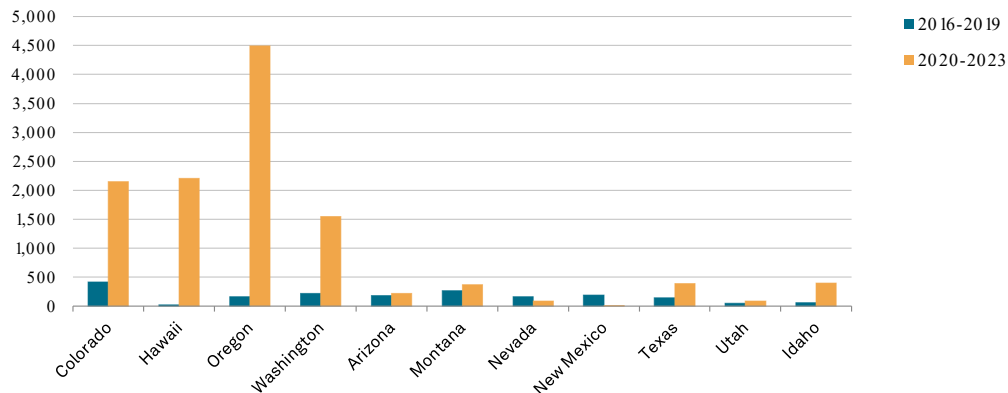
Chart 4
California structures destroyed by wildfires



Source: Headwaters Economics and National Fire and Aviation Management FAMWEB.
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While California's IOUs and POU's have implemented comprehensive wildfire mitigation plans, many utilities in other western U.S. states haven't yet adopted such sophisticated strategies. Since 2020, structures destroyed because of wildfires in Colorado, Hawaii, Idaho, Oregon, Washington, and Texas have all increased by more than 100% compared to the prior 2016-2019 period. Furthermore, Arizona, Montana, and Utah have each experienced increases of at least 20% over this same timeframe. In light of climate change, we believe it's important for IOUs and POU's in the western U.S. states to implement comprehensive wildfire mitigation plans to reduce physical risks, even though many of these utilities have yet to experience a catastrophic wildfire.

Chart 5

Structures destroyed by wildfires in western states*

*Excludes California. Source: Headwaters Economics and National Fire and Aviation Management FAMWEB.
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Three Key Areas To Reduce Physical Risks

We expect IOUs subject to rising physical risks will develop a three-pronged strategy toward reducing risk. This includes reducing damages from physical events, minimizing litigation risk, and expanding capabilities for cost recovery. POUs are also heavily investing in wildfire mitigation and related technology. While it may take some time and significant investments for the industry to fully implement these strategies, the solutions are nonetheless practical because many are predicated on already developed and in-use technologies.

Reducing Damages From Physical Events

System hardening is an important investment that improves resiliency, reducing damages and risk. Because our modern economy is so dependent on electricity, system hardening also allows for the faster restoration of operations, decreasing total economic impacts. While system hardening is often expensive and can take many years to fully implement, its long-term benefits significantly reduce risk typically outweighing its shorter-term costs. Examples of system hardening include the undergrounding of powerlines, cover conductors--which is the insulation of bare electrical wires with durable long-lived materials that reduce the probability of an electrical fault or spark--and the replacing of wood poles with steel and concrete.

Southern California Edison Co. (SCE) is currently aggressively replacing its overhead distribution lines with covered conductors. The utility expects to replace more than 7,200 miles, or the vast majority of its distribution lines by 2025. Pacific Gas & Electric Co. (PacGas) is currently undertaking a long-term system hardening initiative that includes undergrounding 10,000 miles of its powerlines. POUs are also undergrounding or replacing wood poles with steel poles, including Guam Power Authority (particularly for the typhoons it experiences), Sacramento Municipal Utility District (for its most at-risk power lines in elevated risk zones), Brunswick Electric Membership Corp. in North Carolina, and Seattle City Light. Other POUs such as Anaheim Public Utilities' electric system and Central Florida Tourism Oversight District (formerly Reedy Creek Improvement District) have long had most of their power lines underground.

To reduce the likelihood of causing or contributing to a catastrophic wildfire, many utilities have incorporated weather stations that collect data, which it then uses to forecast weather conditions, including high-wind events. Some utilities have incorporated artificial intelligence (AI) and machine learning into their data analysis, enhancing their forecasting capabilities. Other key tools for wildfire detection include high-definition (HD) cameras, satellite and aerial imaging, remote sensing, and drones. As part of these strategies, utilities have improved communication with state agencies and fire departments, coordinating specific locations that have either encountered or could be highly susceptible to a wildfire. Critical to reducing wildfire risks is the implementation of a public safety power shutoffs (PSPS) program. PSPS is the proactive de-energizing of power lines in extreme weather conditions especially in high-wind events. The decision to de-energize is extraordinarily challenging because it could have serious health and safety ramifications for some customers. Accordingly, it is important that a PSPS program establishes a consistent process for de-energizing power lines and is approved by regulators well in advance of a catastrophic event. We view a PSPS program that establishes such a formal process as a credit-supportive tool that reduces risk for IOUs.

For POUs, in particular, most utilities that have significant wildfire risks have adopted protocols and policies to de-energize power lines in advance of threatening conditions. But some utilities are unlikely to pre-emptively shut off power to avoid wildfire risks because those utilities believe doing so introduces other public safety or health risks, particularly for electric utilities located in large urban areas.

Another crucial component of wildfire prevention is vegetation management, which is the removing or modifying of live and dead vegetation to reduce the potential spread of wildfire ignitions. This ongoing maintenance is essential for reducing the likelihood of debris coming in contact with powerlines, causing a spark that could lead to a wildfire. To further reduce wildfire risks, utilities have implemented enhanced power safety setting systems (EPSS) that automatically shut off power within a tenth of a second if they detect a potential ignition source. Such systems include downed conductor detection, early fault detection, open phase detection, and partial voltage force out.

Because of the different service territories and topographies, we don't expect the strategies implemented by utilities to be uniform. As such, we expect that a utility wildfire mitigation plan will be customized but with the consistent goal of reducing risk.

The table below details aspects of wildfire mitigation strategies that have been implemented by various utilities to reduce physical risks. This table is not comprehensive of each utility's strategies, and generalization is used because of space constraints. For more details regarding each utility's wildfire mitigation plan, please see their website.

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Regulated IOU wildfire mitigation plans

Enacted Not enacted

Utility name	Undergrounding	Covered conductor	Poles enhancements/replacements	Public safety power shutoff programs (PSPS)	Vegetation management	Periodic inspections	Situational awareness and forecasting	Aerial surveillance/HD cameras
American States Water Company (BVESI)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: Data governance, ignition detection sensors and systems, fault monitoring								
FortisAlberta Inc.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: Insulator washing, porcelain switch replacement								
Idaho Power Company	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: Satellite imagery, shared stewardship								
Liberty Utilities (CalPeco Electric) LLC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: Wildfire, outreach, communication, stakeholder communication, plans to sponsor 8 cameras to the ALERT Wildfire Network in 2023								
Los Angeles Dept. of Water and Power	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: LAFD notifies LADWP of NWS Red Flag Warnings, block reclosers in certain situations								
NorthWestern Corporation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
NV Energy Inc. (NPC and SPPC)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: AI, FTFM relay settings, installed 65 weather stations and 11 cameras								
PacGas	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: EPSS/downed conductor detection, early fault detection sensors, partial voltage force out, satellite IR imaging, HD video, land-based IR cameras								
PacifiCorp	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: Public safety partner portal, AI and machine learning, downed conductor detection, early fault detection, installed 454 weather stations and 25 cameras								
Public Service Company of Colorado	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: AI and machine learning, early fault detection, open phase detection, unmanned aerial system and LiDAR-equipped helicopter inspection								
Sacramento Municipal Utility District	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: Disables reclosers during wildfire season, installed 14 weather stations								
SDG&E	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: AI and machine learning, early fault detection, public safety partner portal, weather stations, smoke plume modeling, satellite-based remote sensing cameras, AI smoke detection algorithm								
Southern California Edison Co.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Detail: AI and machine learning, early fault detection, open phase detection, HD cameras, aerial suppression, fast curve relay systems, REFCL technology								

*Piloting program, UAS--Unmanned aerial system, LiDAR--light detection and ranging, LAFD--Los Angeles Fire Dept, LADWP--Los Angeles Dept. of Water and Power, NWS--National weather service, REFCL--Rapid Earth Fault Current Limiter, FTFM--Fast trip fire season mode, NPC--Nevada Power Company, SPPC--Sierra Pacific Power Company, Source: Company documents, Copyright © 2023 by Standard & Poor's Financial Services LLC. All rights reserved.

Assessing Litigation Risks

Because utilities operate under potentially hazardous conditions that include safety as well as environmental risks, they have always been susceptible to litigation. However, in recent years, as the climate changes and wildfires increase, litigation and class action civil lawsuits against utilities have increased. Currently, plaintiffs have pending civil lawsuits against nine utilities because of wildfires.

Major Wildfires Since 2019 In IOU And POU Service Territories

Year	State	Subsidiary	Weather event	No. of acres burned	No. of structures destroyed
2019	CA	Los Angeles Department of Water & Power	Getty Fire	745	10
2019	CA	Pacific Gas & Electric Co.	Kincade Fire	77,758	374
2019	CA	Southern California Edison Co.	Saddle Ridge Fire	9,000	19
2020	WA	Avista Utilities Inc.	Babb Road Fire	15,000	220
2020	CA	Southern California Edison Co.	Bobcat Fire	116,000	171
2020	CA	Liberty Utilities (CalPeco Electric) LLC	Mountain View Fire	20,879	80
2020	WA	Avista Utilities Inc.	Road 11 Fire	10,000	0

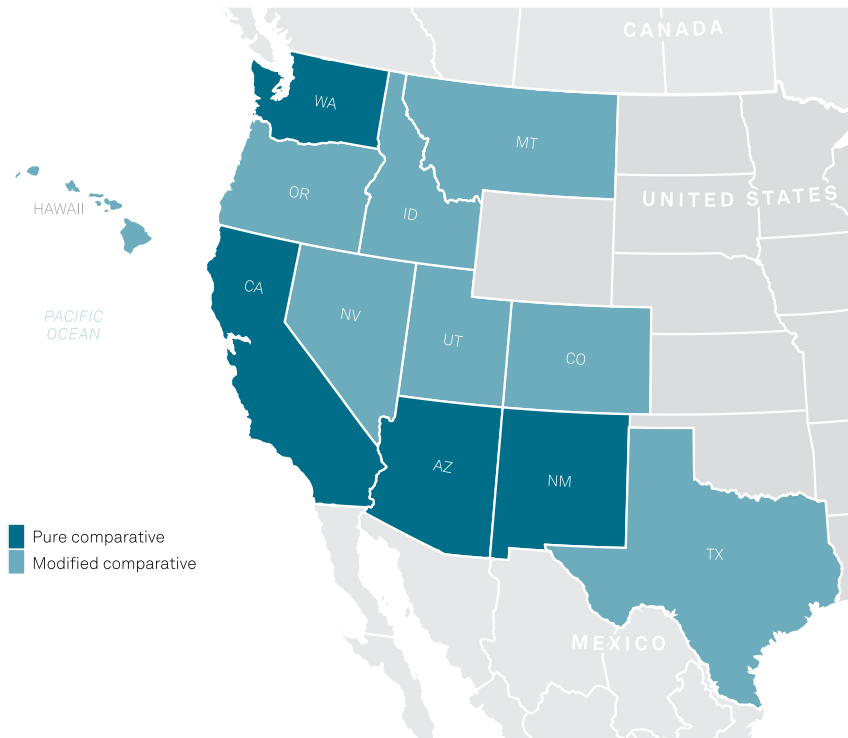
2020	OR	PacifiCorp	2020 wildfires	350000*	1560*
2020	CA/OR	PacifiCorp	Slater Fire	150,000	440
2020	CA	Pacific Gas & Electric Co.	Zogg Fire	56,338	204
2021	CA	Pacific Gas & Electric Co.	Dixie Fire	963,309	1,311
2021	CO	Public Service Co. of Colorado	Marshall Fire	6,000	1,000
2022	CA	Southern California Edison Co.	Coastal Fire	200	20
2022	CA	Southern California Edison Co.	Fairview Fire	28,000	22
2022	CA	Pacific Gas & Electric Co.	Mosquito Fire	76,788	78
2022	CA	PacifiCorp	McKinney Fire	60,000	185
2023	HI	Maui Electric Co. Ltd.	2023 Hawaii Wildfires	17,000*	2,210*

*More than. Source: Company documents and public information.

The degree of litigation risk for a utility depends on the specifics of the statutory law including the standard of negligence, inverse condemnation, caps on damages, and the number of jurors necessary to determine liability.

Standards Of Negligence

The negligence laws for all Western U.S. states require that the plaintiff demonstrates that the defendant is at fault for acting in a deficient manner or for breaching the duty of care. While there are differences between states' standards of negligence, we consider litigation a material credit risk that affects the entire industry. Arizona, California, New Mexico, and Washington operate under a pure comparative negligence standard that can find a defendant liable even if a plaintiff was 99% at fault. Although in such a scenario the defendant's liability is limited to just 1%. Colorado, Hawaii, Idaho, Montana, Nevada, Oregon, Texas, and Utah operate under the modified comparative negligence standard, which limits the defendant's risk. In these states, the defendant can be found liable for damages only if they caused at least 50% of the damages. Because the modified comparative standard of negligence is less onerous on the defendant, we assess utilities that operate in these states as having somewhat lower credit risk.

Comparison of negligence standards by Western state

Source: S&P Global Ratings.
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Inverse Condemnation

In California, IOUs and POUs are held to a higher level of accountability through the state's interpretation of inverse condemnation doctrine--whereby a California utility can be financially responsible for a wildfire if its facilities were a contributing cause of a wildfire, irrespective of negligence. While we assess this interpretation as not credit supportive, to date California remains the only Western U.S. state that supports this interpretation for utilities.

Limiting Damages

For most civil lawsuits, if the defendant is found liable, jurors may assess economic damages, non-economic damages, and punitive damages. Economic damages are the reimbursement of actual monetary losses, while non-economic damages are more subjective and can sometimes include emotional distress, medical expenses, and lost wages. In some instances, punitive damages are assessed if it's determined that the defendant acted in a negligent or gross negligent manner. Punitive damages are essentially a penalty to deter further intentional or reckless behavior.

The maximum amounts for non-economic, and punitive damages are sometimes capped by state statutes, and we view these caps as supportive of credit quality, limiting the total potential damages. For example, in Colorado, non-economic damages are capped at about \$614,000, and punitive damages are limited to 1x total damages; however, both of these caps can be increased under various circumstances. Washington state does not allow for punitive damages but does not have a cap on non-economic damages.

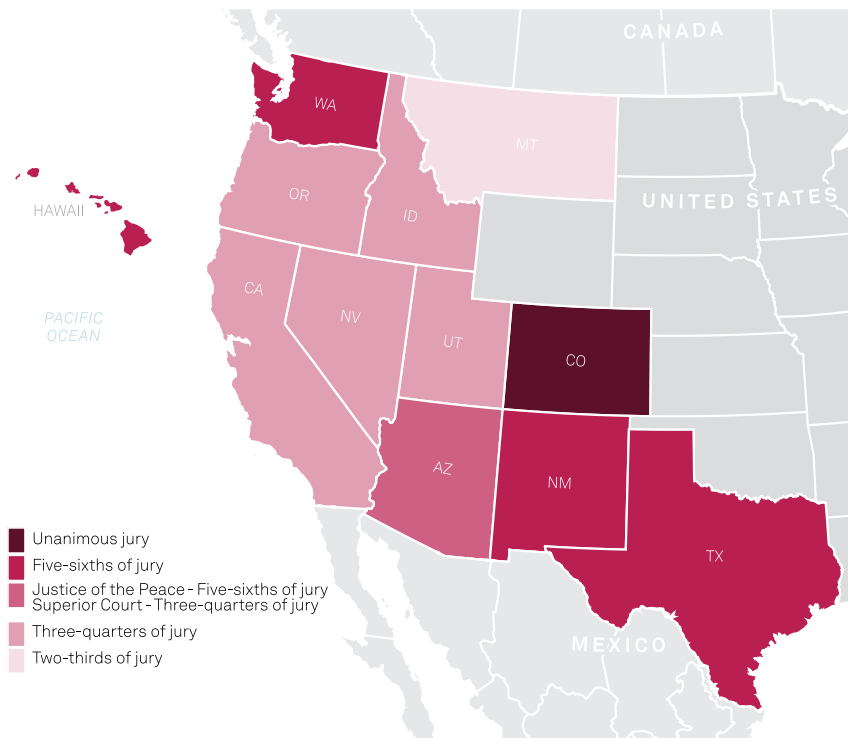
Recently, jurors in a class action wildfire lawsuit against PacifiCorp, a subsidiary of BHE, in Oregon assessed economic damages at about \$4 million for 17 plaintiffs but added non-economic and punitive damages of about \$68

million and \$18 million, respectively. This increased total awarded damages to about \$90 million or about \$5.3 million per plaintiff, significantly higher from our base case of about \$1 million per plaintiff, diminishing PacifiCorp's credit quality.

Jurors Necessary For A Liable Verdict

The number of jurors necessary to determine liability is another critical factor to assess litigation risk. When comparing the Western U.S. states, Montana, which requires only two-thirds of the jurors vote to determine liability in a civil lawsuit would represent the highest risk for a utility, while Colorado, which requires a unanimous jury decision is the lowest risk.

Number of jurors required for a liable verdict by Western state



Source: S&P Global Ratings.
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Expanding Cost Recovery Capabilities

After a utility experiences damages from a physical event or after being found liable for a wildfire, the utility must pay for these costs. We expect that IOUs and POUs will recover most of these costs from ratepayers, which has generally supported the industry's credit quality. However, when the costs become unusually large, regulatory lag--the timing difference between when a utility incurs costs and when it's recovered from ratepayers--increases, the balance sheet leverages, and utilities have even experienced significant disallowances that weaken credit quality. In these instances, we believe the industry hasn't contained the credit risk and the industry is short of protective credit capabilities. As such we believe it's important for the IOU industry to significantly increase and broaden recovery capabilities. This includes implementing storm reserves, increasing commercial insurance levels, incorporating self-insurance, participating in a special wildfire fund, and securitization. While expanding cost recovery capabilities would support credit quality, we believe this alone without reducing damages from physical events or minimizing

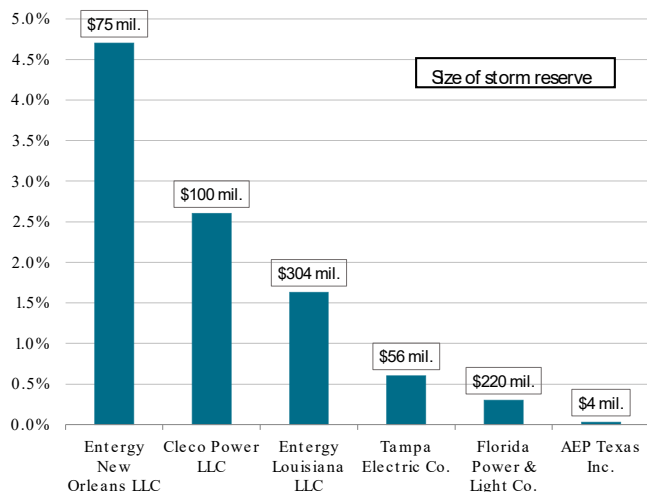
litigation risk, would likely not be sufficient to reduce credit risks. Many POU's carry wildfire liability insurance or maintain self-insurance reserves set aside for potential wildfire liabilities. While POU's may receive federal emergency management agency (FEMA) reimbursement for damage to system infrastructure from wildfires, liabilities aside, FEMA reimbursements often entail considerable lag making internal liquidity or market access critical.

Storm Reserves

Storm reserves allows a utility to prefund from customers storm recovery in advance of a physical event. We view this tool favorably for credit quality because the utility already has the cash reserve that can be immediately used to address the damages following a physical event. We assess a storm reserve as supportive to reduce short-term liquidity needs, minimizes the regulatory lag for IOUs, and reduces balance sheet leverage. Smaller sized utilities with higher exposure to hurricanes and storms such as Entergy New Orleans LLC or Cleco Power LLC typically have a relatively higher storm reserve when compared to their net plant, property, and equipment (PP&E).

Chart 6

Storm reserve as a percentage of PP&E



PP&E--Property, plant and equipment. Source: Company documents.
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Insurance Hurdles

Increasing property and liability insurance coverage decreases a utility's financial exposure to physical risks, and for many years the utility industry has effectively implemented this risk-reduction strategy. However, in recent years, insurance companies have experienced underwriting losses in property lines, driven by a combination of higher inflation increasing repair costs and more severe weather-related events. Insurers have responded by raising rates and reducing their exposure to residential and commercial property risks in areas exposed to natural catastrophes. This has led to higher insurance premiums and deductibles for policy holders--paying more for less coverage--decreasing the viability of this strategy.

Due to more stringent oversight of homeowners insurance rates by state regulators, it's more difficult to increase rates on homeowners quickly enough to offset higher-loss cost trends and return to profitability. In Florida, this has led several insurance companies to exit the homeowners' market, while in California, several large insurers--including State Farm, Allstate, Farmers and USAA--have reduced or stopped writing new homeowners policies, though they continue to provide coverage for most existing policyholders. For commercial property insurance customers, insurers have been raising rates aggressively to offset higher losses and restore profitability. As noted by PG&E in a 2022 advice letter filed with California Public Utilities Commission, it and the other California IOUs have continued to see increases in the cost of excess liability insurance for wildfires as the number of insurers offering such coverage has decreased, leading to an overall reduction the amount of capacity available.

Given the pressure in the insurance market, some utilities are contemplating greater use of self-insurance. Under the self-insurance model, a utility forms a captive insurer or initiates a fund through a customer charge that it uses to pay losses from physical events. PG&E and SCE currently employing such a strategy through the establishment of a customer funded \$1 billion self-insurance fund that will replace the wildfire liability insurance the company has been purchasing in the commercial market. We view the self-insurance model as supportive of credit quality especially when purchasing adequate liability insurance levels becomes uneconomic or simply not available in the commercial marketplace.

Additionally, in 2020, a special wildfire fund was established under Assembly Bill 1054 by California to decrease physical risks for its IOUs. This special wildfire fund excludes POUs. We view the wildfire fund as highly supportive of credit quality for IOUs. California's largest IOUs (PacGas, Southern California Edison Co. and SDG&E) primarily established the \$21 billion wildfire fund that was equally funded by shareholders and ratepayers. Since its inception, to our knowledge, the fund has not yet been tapped, providing significant financial cushion for California's IOUs.

Utility Securitization

Securitization allows for the issuance of debt secured by a non-by-passable charge to the customer's bill, allowing the utility to fully recover its costs at a lower interest rate for customers. In other words, utilities with regulatory approval, can securitize costs associated with the fallout from storms, other weather-related incidents, energy transition, commodity prices, or other events. Because the debt is secured by the high likelihood of customers paying their bills, the associated interest costs are typically lower. We often deconsolidate such debt, resulting in stronger IOU credit measures and view securitization as supportive of credit quality. The use of securitization has recently increased. Following the 2021 Winter Storm Uri, several states including Texas, Kansas, and Oklahoma passed legislation requiring utilities to issue securitized bonds to fund the high costs of deferred natural gas costs incurred during the storm. In March 2022, Rayburn Country Electric Cooperative (Rayburn) securitized \$900 million of its \$920 million in eligible extraordinary costs resulting from Winter Storm Uri and discharged \$637 million in invoices to the ERCOT that had been unsettled for almost one year. During the storm, Rayburn's electricity demand and power costs surged for almost a week, leading to extremely large invoices from ERCOT that Rayburn lacked sufficient liquidity to pay in full.

Credit Quality Could Suffer As The Climate Changes

We believe it's important for IOUs and POUs exposed to rising physical risks to reduce their credit risks by developing and implementing comprehensive risk mitigation strategies. Although many IOUs and POUs haven't yet been directly exposed to a catastrophic event, it's imperative that the industry remains vigilant as the pace of climate change progresses. While a comprehensive risk reduction strategy does not guarantee that a utility is immune from these rising physical risks, we believe it does significantly reduce much of the risk because the strategy is mostly predicated on already developed and in-use technologies. As climate change progresses, we will continue to monitor physical risk hazards across North America. Credit quality for IOUs and POUs that have exposure to physical risks and do not proactively implement a comprehensive risk-reduction strategy could be pressured.

This report does not constitute a rating action.

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