Guidehouse

Modernizing wildfire mitigation and grid resilience

Multi-mission unmanned aerial systems offer a strategic investment for utilities

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Rising wildfire risk and mounting energy pricing pressures demand new solutions. Multi-mission unmanned aerial systems (UAS) are an affordable, effective, and scalable tool for improving grid resilience.

Executive summary

Wildfire risk is rapidly reshaping the electric utility landscape, driving sustained increases in capital and operating costs while intensifying regulatory scrutiny on mitigation programs. In 2026, nearly 1.9 million acres burned in the U.S. through early May—an area larger than the state of Delaware. As utilities expand investments in grid hardening, inspections, and vegetation management, wildfire mitigation has become a material and growing component of the cost of service.

Despite these investments, however, a critical gap remains between ignition detection and suppression. Detection technologies have improved significantly, but response times are often measured in hours, leaving utilities exposed to high-consequence wildfires.

Multi-mission unmanned aerial systems (UAS) address this gap by enabling rapid, targeted response alongside continuous inspection and monitoring. Advances in payload capacity, onboard computing, and communications have transformed multi-mission UAS from inspection tools into operational platforms capable of supporting wildfire detection, suppression, and asset management within a unified system.

This multi-functional capability translates into measurable economic value. By enabling earlier intervention and more efficient, condition-based operations, multi-mission UAS reduce both catastrophic risk exposure and recurring O&M costs. Illustrative analysis indicates potential value of approximately six dollars in avoided mitigation and response costs for every dollar invested over five years.

As regulators increasingly prioritize cost discipline and integrated system planning, multi-mission UAS offer a defensible pathway to improve resilience outcomes while moderating rate impacts.

Key takeaways

- Wildfire risk is a primary driver of rising utility costs and rates.
- The largest remaining wildfire mitigation vulnerability is the delay between detection and response.
- Multi-mission UAS provide rapid response plus continuous monitoring in a single platform.
- Value derives from both fewer catastrophic events and more efficient O&M.
- Multi-mission UAS have the potential to deliver ~6x benefit-to-cost over five years, aligning with regulatory priorities on affordability and efficiency.

Introduction

Wildfires burned nearly 1.9 million acres in the U.S. in 2026 through early May—nearly double the 10-year average for that same period.[1] The average area burned by wildfires annually has more than doubled over the past 30 years; in the late 1980s, wildfires consumed 3–4 million acres per year; now ~8 million acres are at risk each year.[2] In California, the January 2025 Los Angeles wildfires became the costliest wildfire disaster in U.S. history, with insured losses exceeding $30 billion and total economic damages estimated in the hundreds of billions of dollars.[3] And the problem isn't limited to the Western U.S. In 2025, the eastern states saw the largest increases in both wildfire counts and burned acres nationwide, with burned acreage 159% above the 10-year average.[4]

Wildfire risk is a defining operational and financial challenge for electric utilities today, driving billions of dollars in incremental annual investment in grid hardening, vegetation management, asset inspections, and emergency response. For many large utilities, particularly in California and other wildfire-prone states, wildfire mitigation now represents a material share of the total cost of service and a sustained source of regulatory pressures. In extreme cases, wildfire liabilities have proven existential, most notably driving Pacific Gas & Electric (PG&E) into Chapter 11 bankruptcy in 2019 amid ~$30 billion dollars in claims related to the Camp Fire.[5] Even absent catastrophic events, rising liability exposure is increasing investor risk, pressuring utility stock prices, and elevating the cost of capital needed to finance ongoing system investments.

"Multi-mission UAS represent a modern platform that can deliver outsized value relative to investment, with estimated savings mounting to ~6x the cost of the system over a five-year period."

Utilities have responded to this critical threat with growing resilience investments and increasingly sophisticated use of technology. As such, wildfire mitigation spending has become one of the fastest-growing utility investment categories. Berkshire Hathaway Energy has said its wildfire mitigation capital spending would increase at a 33% CAGR between 2022 and 2027—from under $200 million to nearly $800 million.[6]

At a time when energy affordability is a central concern for regulators and the customers they protect, the rapid growth in wildfire mitigation expenses is coming under increased scrutiny. Utilities and regulators must balance near-term affordability pressures with the escalating risk wildfires pose to infrastructure and public safety.

[1] US wildfires burn nearly 1.9 million acres so far in 2026

[2] Congressional Budget Office wildfire report

[3] Insured losses due to California wildfires to exceed $30 billion -- report | Insurance Business

[4] US wildfires had mix of highs and lows nationwide in 2025, new report shows – Wildfire Today

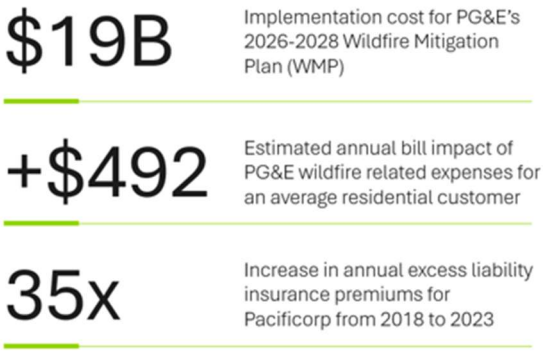
[5] PG&E and the First Climate Change Bankruptcy - Case - Faculty & Research - Harvard Business School

[6] DOE / PNNL utility wildfire mitigation analysis

This dynamic is forcing a more disciplined approach to investment, with a focus on maximizing impact and delivering cost-effective outcomes for ratepayers. In this environment, emerging technologies present an opportunity to improve resilience while making more efficient use of constrained resources. Multi-mission UAS represent a modern platform that can deliver outsized value relative to investment, with estimated wildfire mitigation and response savings mounting to ~6x the cost of the system over a five-year period.

Bridging the response gap

Despite ballooning mitigation investments, a critical gap remains between wildfire ignition detection and effective suppression. While utilities are becoming highly capable at identifying potential wildfire events with fault detection systems, cameras, satellites, and AI analytics, once ignition occurs, suppression still depends on mobilizing ground crews or aerial resources. These deployments can take 1–2 hours or more—even days—depending on local agency availability, geography, and conditions. Delays of just a few minutes can mean the difference between a contained burn and a catastrophic conflagration, particularly under high-wind conditions. This "response gap" represents one of the most significant remaining vulnerabilities in the utility wildfire mitigation framework.



Sources: PG&E Wildfire Mitigation Plan 2026-2028 Volume 1, Enhancing California's Resiliency to Natural Catastrophes Senate Bill 254 (2025) Study Report, 06_Joelle_R_Steward_Direct_Testimony.pdf

Heavy payload multi-mission UAS are poised to introduce a new category of operational capabilities for utilities. Advances in lightweight materials such as carbon fiber, along with improvements in AI-capable edge chips, satellite communications, and high-energy-density batteries, have enabled a new generation of multi-mission UAS with longer range, higher payload capacity, wildfire suppression capabilities, and improved durability compared with traditional drones. These systems introduce a new set of resilience and wildfire response use cases. And with lower-cost economics than traditional mitigation tools and processes, they will provide a more efficient, cost-effective solution available for more frequent use.

Importantly, multi-mission UAS provide a rapid-response solution that complements existing utility fire mitigation systems and resilience investments, enabling faster ignition verification, earlier intervention, improved situational awareness, and targeted suppression in the earliest stages of fire development. These systems are well-suited to cooperative arrangements between utilities and local fire agencies, and coordinated deployment can reduce resource duplication and shorten overall incident response time. Utilities and agencies have already proven that this model works by deploying AI-powered smoke-detection camera networks. For example, APS and the Arizona Department of Forestry and Fire Management jointly use AI-enabled camera systems that

trigger a coordinated response, in one instance allowing firefighters to contain a fire before it grew beyond seven acres.[7] Similar programs are in place across high wildfire risk states.

> ***"Advances in lightweight materials such as carbon fiber, along with improvements in AI-capable edge chips, satellite communications, and high-energy-density batteries, have enabled a new generation of multi-mission UAS with longer range, higher payload capacity, wildfire suppression capabilities, and improved durability compared with traditional drones."***

Beyond wildfire response, multi-mission UAS can also support a broader range of utility operations, including asset inspections, vegetation management, and post-event assessments, reducing redundant spending across utility programs and between utilities and public safety agencies.

Multi-mission UAS are not standalone tools and are in a different mission class than light-duty drones, which perform well for certain use cases such as simple inspections. They also don't replace traditional vegetation management or wildfire prevention, detection, and response investments. Rather, multi-mission UAS represent a way to augment existing capabilities and improve outcomes, acting as a force multiplier on the value of these major investments. Multi-mission UAS position utilities to transition from reactive or prevention-only strategies toward integrated resilience architectures that address both ignition probability and subsequent wildfire consequences. Furthermore, as a multi-functional toolset, investments in multi-mission UAS align well with the growing regulatory focus on grid resilience, cost-effective risk reduction, and affordability.

Wildfire risk is both a CAPEX and an O&M issue

Wildfire exposure today affects utilities across nearly every aspect of their business, from long-term planning and capital investment to real-time operations, vegetation management, and emergency response. This expanded scope has fundamentally changed how utilities must approach wildfire risk. It is no longer sufficient to treat wildfire mitigation as a discrete program; it must be embedded across the operational and financial structure of the utility.

The financial implications are highly visible. Wildfire-related costs are showing up in a range of categories, including large-scale grid hardening investments such as undergrounding, enhanced situational awareness systems, incremental CAPEX due to fire damage, and higher insurance premiums and capital costs. These costs are not isolated. They are interconnected and often compounding—and they all put pressure on customer rates. Undergrounding, for example, is highly effective at reducing ignition risk but operates on a far higher cost scale. Utilities spend ~$2–$6 million per mile for undergrounding and are committing to multi-billion-dollar programs, such as PG&E's nearly $6 billion plan to underground approximately 2,000 miles of lines.[8]

[7] AI cameras help Western states detect wildfires before 911 calls

[8] California regulators approve new program to expedite power line undergrounding | Utility Dive

In one recent proceeding, Southern California Edison (SCE) sought recovery of approximately $113 million in incremental O&M and $136 million in incremental capital expenditures for wildfire mitigation activities. In all, nearly $250 million in additional funds were requested for programs spanning inspections, system hardening, situational awareness, and customer programs.[9] Unsurprisingly, SCE's residential rates have also risen in recent years, climbing 25% from 2022 to 2025, and nearly doubling between 2015 and 2025.[10] In a regulated rate-of-return model, rates are expected to climb with rising expenses and inflation. But as these critical wildfire mitigation investments have accelerated, regulators are placing increased scrutiny on the efficacy of utility solutions and spending, not only in California but nationwide.

"Traditional utility wildfire mitigation approaches remain fragmented within most enterprises. Different departments manage inspection programs, vegetation management, emergency response, and customer-facing initiatives, each with their own tools, budgets, and operational constraints."

While rising demand from AI and data centers often dominates the headlines about rising energy prices, in fact, recent analysis by Lawrence Berkeley National Laboratory shows that utility spending on resilience and wildfire mitigation is a primary driver of recent increases in electricity costs[11]—and the problem is only growing. In the Western U.S., the wildfire season has expanded from roughly 5 months in the 1970s to more than 7 months today.[12]

Nonetheless, traditional utility wildfire mitigation approaches remain fragmented within most enterprises. Different departments manage inspection programs, vegetation management, emergency response, and customer-facing initiatives, each with their own tools, budgets, and operational constraints.

These programs are rarely optimized as part of an integrated system, leading to overlapping investments, inconsistent data, and inefficient resource deployment. In APS's 2026 Wildfire Mitigation Plan,[13] mitigation and response activities span at least five major program categories and more than 25 distinct operational roles, ranging from field operations and vegetation management to incident command, communications, customer outreach, and external coordination, all executed across multiple departments and functional teams.

A top-down approach to planning and investment across utility operational silos—and in coordination with local fire agencies—has the potential to reduce the frequency and severity of wildfires. Shared resources such as detection systems, communication networks, and multi-mission UAS are becoming essential components of a holistic utility wildfire mitigation strategy.

[9] https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M520/K520/520520666.PDF

[10] 2025 Q1 Electric Rates Report

[11] Factors influencing recent trends in retail electricity prices in the United States - ScienceDirect

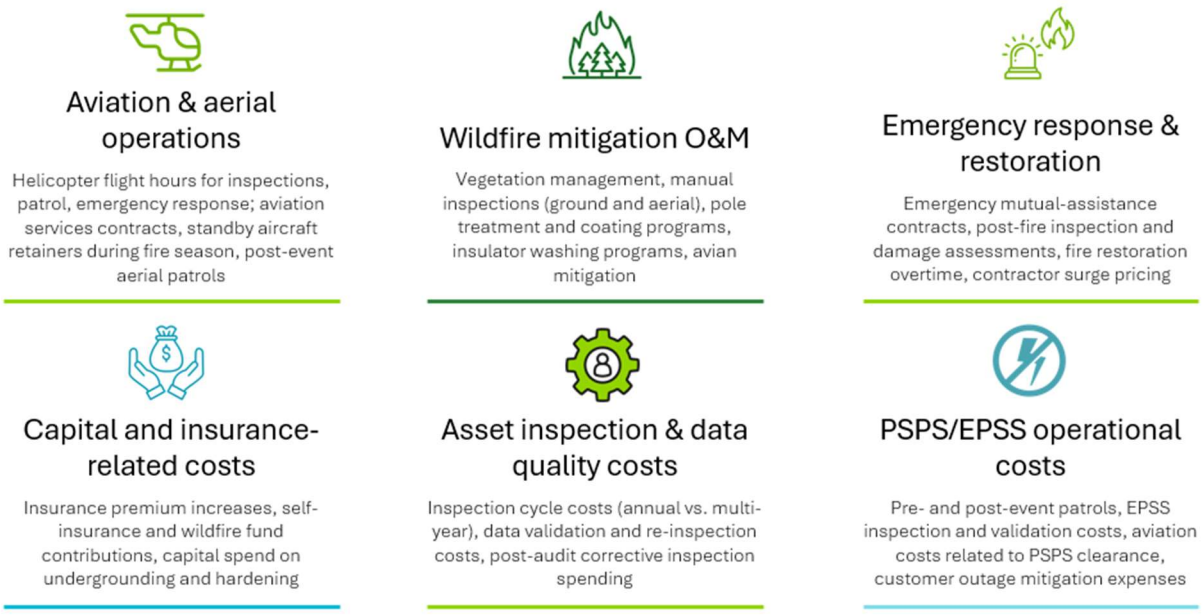
[12] Wildfire | USDA Climate Hubs

[13] 2026 APS Wildfire Mitigation Plan.pdf

The limits of traditional wildfire mitigation and suppression models

As of 2025, utilities have developed over 400 wildfire mitigation plans across 170 entities in 18 states.[14] The traditional wildfire mitigation model relies on a patchwork of tools and approaches, each designed to address a specific function and creating its own cost center. Utilities deploy crewed helicopters for patrols and inspections, ground crews for asset maintenance and vegetation management, and manual treatment processes for infrastructure protection.

Cost centers for utility wildfire mitigation and response



Additionally, utilities typically have agreements with vendors to mobilize specialized resources during and immediately after wildfire events. These may include contracted crews, bulldozers, water tenders, or private firefighting services that can assist with suppression efforts during active incidents; on-call aircraft for water/retardant drops; post-incident patrols to restore service, repair damaged lines, and re-energize circuits; debris removal and restoration services including contractors for clearing burned infrastructure, removing hazard trees, and rebuilding poles, conductors, and substations; and specialized equipment and logistics for mobile staging, temporary generation, fuel supply, and communications support during extended outages or public service power shutoff (PSPS) events. By some estimates, utilities may be spending upwards of $2 billion per year[15] on outside service providers, with tens of thousands of workers needed in the wake of major storm or wildfire events.[16]

These approaches, while established, have clear limitations. They are expensive, often requiring significant ongoing labor and specialized equipment. They are episodic, deployed only at certain

[14] Statistics of WMPs.pdf

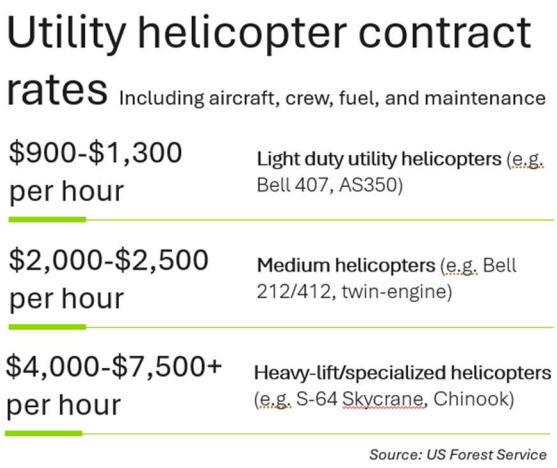
[15] A Look at the 2021 T&D Services Market in the United States - Newton-Evans Research Company, Inc.

[16] Mutual assistance power army continues post-Helene restoration efforts - Daily Energy Insider

times or under specific conditions, rather than continuously. And they are difficult to scale across large service territories, particularly in regions with diverse terrain and varying levels of wildfire risk.

Operational constraints further limit their effectiveness. Many mitigation activities compete for the same crews, contractors, budgets, and narrow time windows, particularly during peak wildfire seasons. As a result, utilities may be forced to prioritize certain activities over others, leaving coverage gaps or delegating important activities to expensive third-party contractors.

Response times in developing situations can be critically impacted. Early-stage ignitions frequently escalate before suppression or inspection resources can be deployed. In Lahaina, Hawaii, in 2023, winds of up to 80 mph turned a small brush fire into a devastating urban wildfire, destroying more than 2,200 structures within hours and resulting in over 100 fatalities.[17]



Utilities typically do not maintain internal suppression capabilities, relying instead on external agencies. That said, as the wildfire threat has grown, some utilities today are investing in their own firefighting capabilities, including, in some cases, their own fire engines or helicopters. Not only are hourly rates for contracted helicopters high, but standby costs can be tens of thousands of dollars per day. In California, SCE spends $35 million annually for the use of four Type 1 helicopters with heavy-lift capacity.

Similarly, inspection practices are constrained by the cost and logistics of traditional methods. Most utilities perform comprehensive inspections on an annual or multi-year cycle. This is not often enough to capture rapidly changing conditions, creating gaps in situational awareness and limiting utilities' ability to make fully informed operational decisions.

These recurring inspection and patrol expenses add up quickly. Public Service of Colorado spends $1.25 million per year on annual inspections of high-risk areas across its roughly 3,500 miles of transmission lines,[18] or nearly $360/mile. Based on approximately 600,000 miles of transmission line across the country, utilities nationwide may be spending more than $200 million a year to get a view of the condition of these critical assets.

And ongoing vegetation management—a critical first line of defense against wildfires—is particularly expensive, costing as much as $42,000 per mile of transmission line. Vegetation-related issues account for more than 20% of power system outages in the U.S.[19]

[17] Fast Fires - Why Speed Defines Modern Wildfire Management | Genasys

[18] Attachment WSP-1, Updated WMP Transmission Costs

[19] Vegetation Management Resilience Investment Guide

Multi-mission UAS have diverse capabilities

While conventional drones are typically limited to short-duration inspection tasks with small payloads and require on-site pilots, heavy-lift multi-mission UAS are designed as long-term infrastructure assets that can support a broader range of operational and wildfire-mitigation activities. Several key characteristics differentiate these systems and drive their value. Multi-mission UAS:

- **Carry significantly heavier and more diverse payloads**, enabling functions beyond inspection. These include high-resolution LiDAR, hyperspectral and thermal imaging for vegetation and risk detection, as well as active treatment and suppression equipment (e.g., sprayers, ignition systems). Lightweight drones are typically limited to cameras or small sensors and cannot perform these intervention-based functions.
- **Operate with greater stability and capability in extreme conditions**, including high winds and rugged terrain, allowing deployment during active wildfire conditions or in areas where crewed aircraft or ground-based methods may be unavailable or unsafe.
- **Enable remote and autonomous operation**, reducing reliance on line-of-sight piloting. Unlike traditional drone deployments that require on-site operators, these systems integrate onboard computing and communications that support beyond-line-of-sight operation, allowing a single operator to manage multiple assets and expand coverage.
- **Provide longer flight times and greater range**, allowing them to cover larger service territories and reach remote or high-risk areas more efficiently, rather than requiring frequent repositioning and relaunch.
- **Incorporate advanced onboard computing and AI**, enabling real-time inspection, navigation, obstacle avoidance, and decision support, shifting from manual data collection to automated analysis and action in the field.
- **Maintain continuous connectivity** through satellite communications, enabling real-time data transmission, coordination, and integration with utility control systems, even in remote or infrastructure-constrained environments.

Taken together, these capabilities shift multi-mission UAS from a tactical, pilot-driven inspection tool to a strategic operational platform. A single system can support inspection, monitoring, suppression, and targeted mitigation activities across the wildfire lifecycle, reducing reliance on fragmented tools and contractor-dependent workflows while improving utilization, response time, and overall cost-effectiveness.

Layered use cases across the wildfire and grid safety lifecycle

The value of a multi-purpose aerial platform becomes most apparent when considered across the full wildfire and grid safety lifecycle. In the context of suppression and emergency response, these systems enable rapid reaction to early-stage ignitions, often before fires have an opportunity to intensify. The Camp Fire escalated from ignition to community-scale destruction in roughly 1–3 hours[20] due to high winds and multiple ember-driven ignitions. An estimated $16.5 billion in economic damage[21] occurred over the 17 days the fire burned—roughly $670,000 in economic loss per minute the fire was active. According to one analysis[22] reducing wildfire response time by just 15 minutes could save billions in annual economic losses.

Additionally, multi-mission UAS can operate in close proximity to infrastructure, enabling precise, targeted suppression and reducing the likelihood of damage to critical assets. And because they can operate remotely and in conditions that may be unsafe for human flight, these systems also reduce risk to personnel.

Inspection and monitoring represent another critical application. Multi-mission UAS can perform high-resolution inspections of transmission and distribution assets, including towers and other hard-to-reach structures. Following major events such as high winds or fire incidents, they can be deployed quickly to assess damage and identify necessary repairs. This capability is also valuable in post-PSPS scenarios, where rapid validation is needed to restore service safely.

Preventive treatment and risk reduction further expand the value proposition for heavy-lift multi-mission UAS. Activities such as insulator washing, nest removal, and pole treatment can be performed more frequently and with greater precision than manual methods allow. By targeting known high-risk areas, utilities can reduce the likelihood of ignition events and minimize the need for more costly interventions later. These capabilities can be summarized as a set of repeatable, high-value operational use cases across utility and wildfire response functions, as shown in Table 1 below.

In short, a single platform does not replace a single cost center, but it can reduce multiple cost categories simultaneously, shifting utilities from reactive spend to earlier, lower-cost interventions and providing dramatically enhanced preparedness on an ongoing basis.

[20] Camp Fire Progression Timeline, National Institute of Science and Technology

[21] sa1162SignedReport.pdf

[22] The economic, fiscal, and environmental costs of wildfires in California

Table 1: Heavy-lift multi-mission UAS use cases and value levers for utilities

Use case	Cost category impact
Integration with early detection systems and rapid initial suppression near utility infrastructure	✓ Avoids escalation into high-cost wildfire events (liability, restoration, insurance) ✓ Reduces emergency response and mutual aid costs
Precision suppression, targeted protective treatment, and maintenance	✓ Limits asset damage and reduces repair/rebuild CAPEX ✓ Lowers vegetation and ignition-risk mitigation costs
Comprehensive asset inspection and condition monitoring	✓ Reduces recurring inspection O&M (crews, helicopters, contractors) ✓ Improves defect detection, avoiding costly remediation later
Post-event assessment and service restoration	✓ Accelerates circuit validation and re-energization (PSPS/storm events) ✓ Reduces outage duration (SAIDI/SAIFI exposure) and restoration costs
Vegetation risk identification and targeted mitigation	✓ Improves precision vs. cycle-based trimming, lowering vegetation management spend ✓ Reduces ignition probability (downstream fire and liability cost avoidance)
Routine patrols and situational awareness across service territory	✓ Replaces portions of helicopter patrols and manual field sweeps ✓ Improves coverage frequency without proportional cost increase
Logistics and field support in remote or constrained areas	✓ Reduces crew travel time and downtime in remote areas ✓ Improves productivity of existing workforce (key under labor constraints)
Integrated utility and fire agency operations	✓ Reduces duplication across utility and public safety resources ✓ Improves response time and coordination, supporting better outcomes at lower system cost

Source: Guidehouse

Multi-mission UAS can reduce cost—and risk

The value of a multi-purpose aerial capability is therefore not fixed in one program or cost center. Rather, the cumulative value of a multi-mission UAS comes from the combined benefits of two key cost reduction trajectories. First, early detection and intervention can reduce utility exposure to catastrophic, high-consequence wildfires that destroy infrastructure, utility reputations, and financial viability, and, too often, lives. Second, more frequent inspections and preventative maintenance activities—where and when they are actually needed—reduce both cost and risk by improving the efficiency of ongoing monitoring and preventive operations.

Reducing risk exposure through earlier intervention

A disproportionate share of wildfire-related costs is driven by a small number of high-severity events. While electric utility infrastructure is responsible for just ~10% of wildfire ignitions nationally, it accounts for a disproportionate share of area burned and the most destructive fires.[23]

> ***"The Camp Fire escalated from ignition to community-scale destruction in roughly 1–3 hours due to high winds and multiple ember-driven ignitions… [R]educing wildfire response time by just 15 minutes could save billions in annual economic losses."***

Increasingly, the industry is focused on preventing high-consequence incidents that trigger cascading impacts: emergency response, infrastructure damage, prolonged outages, and increased insurance and financing costs. As such, regulatory and, therefore, cost recovery focus will increasingly shift toward preventing wildfire *escalation*.

A heavy-lift multi-mission UAS operates directly in this window, providing suppression capabilities with a fleet of aircraft that can travel farther with larger payloads, get closer to ignition points faster than human ground- or aerial-based crews, and respond with precision. Containing events before they escalate can reduce the frequency of high-consequence outcomes. Even modest reductions in the frequency of high-impact events can materially reduce overall utility wildfire mitigation expenses.

Improving cost efficiency in monitoring and preventive operations

As described above, a large share of wildfire mitigation spending is recurring and operational. Programs such as inspection, vegetation management, and situational awareness are typically labor-intensive and cycle-based, limiting their ability to adapt to changing conditions.

A multi-purpose aerial capability enables a more continuous, condition-based model of system awareness. Rather than relying solely on fixed cycles, utilities can target interventions where risk is highest. This improves the precision of preventive maintenance, reduces redundant work, increases system visibility without proportional increases in field labor, and accelerates post-event validation and restoration.

[23] Wildfires and the Grid Fact Sheet | National Caucus of Environmental Legislators

Over time, these benefits compound. Better monitoring leads to better decisions, reducing reliance on reactive interventions and large-scale corrective actions. The result is a shift from episodic, labor-driven programs toward a more scalable, information-driven operating model.

A combined effect on cost trajectory and affordability

Together, these mechanisms address the primary drivers of growth in wildfire expenses. By reducing exposure to high-cost events and improving the productivity of recurring activities, utilities can moderate cost trajectories while continuing to meet safety and reliability requirements—without creating egregious impacts to energy affordability.

Potential cost savings by multi-mission UAS use case

Source: Guidehouse. illustrative ranges are based on publicly reported utility costs and Guidehouse analysis; actual outcomes will vary based on utility size, geography, and deployment model.

Enabling least-cost risk reduction and multi-use infrastructure

From a regulatory perspective, multi-mission UAS align closely with how commissions already evaluate wildfire mitigation and grid-hardening investments. These systems support core elements of existing frameworks, including inspection, monitoring, and emergency response, while operating across multiple program areas and contributing to broader energy system resilience goals.

Regulators are increasingly focused on whether utilities are deploying capital and O&M budgets efficiently—not simply whether they are reducing risk. A multi-use platform supports three outcomes that align directly with commission priorities: measurable risk reduction, avoidance of higher-cost downstream interventions, and improved utilization of utility assets and resources.

This multi-functional performance profile also addresses a growing concern among regulators: duplication of spending. As utility rate cases increasingly include overlapping investments in monitoring, inspection, and operational response tools, commissions are scrutinizing whether utilities are building parallel capabilities rather than integrated solutions. A single platform that consolidates these functions provides a more defensible basis for cost recovery.

Reducing even a small share of a utility's wildfire-related inspection, corrective maintenance, rebuild, and risk-transfer costs can generate material value because these categories are already large and continue to grow. Figure 1 presents an illustrative five-year value creation scenario using publicly reported utility benchmarks and Guidehouse assumptions. While every utility will have unique baseline costs and savings, for most, the value proposition is clear.

Figure 1: Illustrative five-year value creation scenario for a wildfire-exposed IOU

Cost category	Annual baseline cost	Assumed reduction with multi-mission UAS	Illustrative five-year savings
T&D line inspection	~$2.0M	-50%	~$5.0M
Post-event inspection and validation	~$2.5M	-30%	~$3.8M
Event response / aerial patrol staging	~$4.5M	-25%	~$5.6M
Defect correction / escalation	~$40M	-5%	~$10.0M
Major rebuild programs	~$60M	-1.5%	~$4.5M
Insurance / risk exposure	~$10M	-3%	~$1.5M
Total illustrative five-year savings			**~$30.4M**
Illustrative multi-mission UAS deployment cost			**~$5M**
Illustrative net value			**$25.4**
Value multiple			**6x**

Source: Guidehouse. Inspection, rebuild, and insurance benchmarks are drawn from public utility filings and Guidehouse analysis; post-event and patrol assumptions are illustrative and intended to show order-of-magnitude economics. Exact multi-mission UAS pricing will depend on utility needs and the fleet size required to support operations.

It's time to consider multi-mission UAS

Electricity-related wildfires in the U.S. now cost more than $200 billion in annual economic loss[24] and the risks are no longer regional. More than 30% of U.S. housing is now located in the wildland–urban interface, where utility infrastructure exposure is highest.[25]

Wildfires are redefining the way utilities plan, operate, and invest, and putting intensifying pressure on customer affordability, particularly in the American West. The scale and complexity of the challenge require solutions that move beyond fragmented, single-purpose approaches.

Effective wildfire mitigation requires coordinated action across prevention, inspection, and response, and it must be delivered in a way that improves outcomes without driving unsustainable cost increases for customers. Multi-mission UAS can materially improve this cost equation, delivering upwards of six dollars in avoided mitigation and response expense for every dollar invested. Multi-mission UAS offers a range of capabilities that go well beyond the limited capacities of legacy drone technology. They create a pathway to integration of various functions within a single operational framework and set the stage for utilities to reduce duplicative spending, improve the efficacy of mitigation investments, and—most importantly—lower the likelihood that ignition leads to a catastrophic event.

As technology evolves, the argument for rethinking traditional models becomes compelling. Multi-purpose multi-mission UAS represent not just an incremental improvement, but a shift toward faster, more efficient, and more cost-effective wildfire mitigation, supporting both system resilience and long-term customer affordability.

> ***"Multi-mission UAS can…deliver upwards of six dollars in avoided mitigation and response expense for every dollar invested."***

[24] PNNL Releases Database Tracking Wildfire Mitigation Plans Nationwide | American Public Power Association

[25] Wildfire Mitigation: Wildfire Mitigation Plans, State Funding Pools and Public Safety Power Shutoffs

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