



Modernizing vegetation management:

3 essential benefits for utilities

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How much do utilities spend on vegetation management in a year? It's not just millions, or even a few billion — in the U.S., utilities spend a whopping \$8 billion to maintain vegetation in their networks. And yet, despite these massive investments, power outages continue to increase, with nearly a quarter of outages attributed to vegetation.

The problem is an over-reliance on manual inspections, which cannot provide a comprehensive view of network-level vegetation risks and are subject to human error. As Eric Brown at Sacramento Municipal Utility District explained at Distributech, “Even the best forester or arborist with the best laser rangefinder is potentially a couple of feet off. And that’s on their best day, if they’re not in foggy conditions or the batteries in their rangefinder aren’t low.”

The solution is to modernize vegetation management with data-driven technologies to more strategically tackle the challenges of operational resilience and profitability. By combining remote sensing technologies with the power of artificial intelligence, this intelligence enables utilities to optimize operations for accuracy, affordability and speed.

“Satellite data is quicker to obtain than many other remote sensing technologies, and it’s comprehensive of an entire system,” says Karim Al-Khafaji, Head of Business Development with Overstory, a leading provider of actionable vegetation intelligence built on remote sensing data from satellites, among other sources. “Remote sensing technologies and data analysis drive informed decision-making about which locations are likeliest to have an outage, and this information empowers utilities to allocate resources effectively and improve their operations,” he says.

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For utilities, adopting this actionable approach results in three key benefits that will change their operations immediately and drive growth in the future:



Improve cost savings

Data-driven vegetation management saves on costs and makes the most of O&M budgets. Technology providers like [Overstory](#), which specializes in vegetation intelligence, gather data and analyze it with machine learning algorithms to develop risk frameworks that categorize every mile of a utility's network based on encroachment risks and criticality. These data-driven risk frameworks support a more informed allocation of resources for hotspotting and annual maintenance, among other things.

"If you avoid outages by addressing the riskiest hotspots before problems occur, that means you reduce potential restoration costs," Al-Khafaji says. "You also avoid overtime labor costs if outages or incidents happen at night or on weekends — preventing outages proactively saves on the entire cost load of restoration."

It's not just hotspotting that benefits from vegetation intelligence. Better data helps utilities strategically choose where they could make the most impact from trimming each year. It also informs which work can safely be moved to a future cycle. This means O&M dollars are directed to places where they'll make the most impact.

"One of our customers found that 20% of their network scheduled for trimming on a time-based cycle was actually free of high-risk vegetation," Al-Khafaji explains. "By not sending inspectors or crews to those spans, utilities can optimize their budgets by redirecting those resources to higher-value locations."

Understanding exactly which spans require maintenance and which ones can be deferred results in greater budget predictability. Utilities can accurately plan their vegetation management budgets and proactively address the highest-risk areas in their network at the same time.

“We know vegetation management is one of utilities’ biggest expenses — nearly \$8 billion a year in North America,” says Greg Geller, Founder and CEO of Stack Energy and a consultant with Overstory. “Mechanisms that reduce that spend and provide visibility in a more timely manner can be game-changers.” Additionally, utilities can use satellite data to prioritize where LiDAR flights are needed, which optimizes their budget.

Objective vegetation intelligence not only provides information on the distances to be trimmed, but also reveals tree health and vegetation conditions so that crews are better prepared when in the field. All of this streamlines costs and improves worker safety.

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As Al-Khafaji notes, “Avoiding helicopter flights for inspections in remote locations, and being prepared for what you might find out there when you do go into the field, is clearly beneficial for employees.” With labor costs rising and worker shortages persisting, these optimizations are crucial for cost savings and managing crew workloads.

A photograph of a utility pole with power lines and palm trees against a blue sky. The utility pole is in the foreground, with several power lines extending from it. In the background, there are several tall palm trees. The sky is a clear, bright blue. The text 'Align with regulatory requirements' is overlaid on the left side of the image in a large, white, sans-serif font.

Align with regulatory requirements

Vegetation is consistently one of the [leading causes](#) of outages, and when power lines and dry vegetation come into contact, the consequences can be — as we've seen in California, Texas and Hawaii — catastrophic. This is why transmission utilities must meet annual vegetation inspection requirements under [FAC-003-4](#), and all utilities need to reduce their liability risks from encroaching vegetation.

Remote sensing technologies facilitate utilities' inspection processes for NERC and FERC regulations and even state-level regulations. FAC-003-4 does not preclude any type of remote sensing technology, and LiDAR or unmanned aerial systems can inspect an entire network to comply with these requirements. At the state level, California utilities, for example, can satisfy [PRC 4293](#) vegetation clearance regulations by identifying vegetation encroachment with remote sensing technologies, rather than human external cargo in helicopters, and then precisely targeting those areas with trimming.

Their comprehensiveness and speed make remote sensing technologies better for regulatory compliance — satellite technology combined with aerial inspection and LiDAR provide actionable recommendations faster than manual inspections alone. Utilities can then tackle encroachment, outage and wildfire risks before a problem occurs. “This is why timely data is important,” Geller says. “If it takes 10 months to get data back about wildfire risks, that’s of limited use to utilities.”

The up-to-date, comprehensive nature of satellite intelligence also equips utilities with verifiable evidence of their regulatory compliance activities. “When you tell your regulators or even your board that you have risks under control, they’re going to need proof. Objective, transparent data provides that proof,” Al-Khafaji says.

Utilities can demonstrate that they are adhering to or even surpassing industry best practices by using a combination of the different technologies at their disposal. They have defensible, data-based approaches to risk management with actionable vegetation intelligence. This streamlines regulatory compliance and provides utilities with a strong foundation for decision-making.



The value of data for insurance premiums

Demonstrating risk reduction is vital for maintaining insurance premiums and addressing potential liabilities. For example, an Overstory customer in a rural western region utilized satellite data to confirm vegetation was not the cause of a fire in its territory.

By providing data and documenting their granular, repeated remote sensing efforts, the utility showed they were taking all possible steps to monitor risks on their lines.

Optimize grid reliability



Utilities are hyper-aware of the many risks facing their grids today. Changing weather patterns, like those seen in Texas, California and Hawaii, stress grid infrastructure and cause increasingly more outages. Beyond weather concerns, failing infrastructure demands upgrades that many utilities simply aren't prepared to support.

At the same time, decarbonization and increasing electrification are fundamentally changing how grids work. Distributed energy resources (DERs) require connections in ways that traditional power plants do not, and utilities are managing variable generation from solar and wind sources.

Tackling these 21st-century issues requires modern solutions — and a proactive, data-driven approach to vegetation management can address multiple challenges at once. “Greater visibility combined with a risk-based methodology will drive

significant benefits in reliability,” Geller says. By identifying and trimming the highest-risk vegetation, utilities can better protect their infrastructure. That equates to less downtime and fewer outages.

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FOUNDER AND CEO,
STACK ENERGY

Actionable vegetation intelligence also improves resilience when confronting a major weather event. Utilities across geographies are leaning on system-level intelligence to prioritize areas in need of emergency maintenance ahead of and immediately following storms

This technology also facilitates the auditing of maintenance work to ensure that risks have been properly addressed. “With that data, you can pinpoint a high-risk area and then review it again for risk mitigation,” Geller explains. Rather than wait until the next maintenance cycle, utilities can ensure high-risk spans have been trimmed properly and specifications have been met. And if they haven’t, utilities don’t have to wait until there is an outage or a customer call to fix the problem.

Improving reliability and resilience means better customer relationships for utilities. It can also support rate cases at a time when customers’ bills are a significant concern. “Public utilities commissions are advocating for the consumer, so reliability is very important,” Al-Khafaji says.

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For utilities — whose goal is to keep the lights on for their service territory — proactive vegetation management is vital for a strong, resilient grid.

An aerial photograph of a winding asphalt road that curves through a dense, lush green forest. The trees are tall and closely packed, creating a textured canopy. The road is dark grey and has a white line marking. The overall scene is bright and natural.

Benefits to the bottom line

Utilities understand that digital transformation is necessary to manage today's increasingly complex grid. But they also know that digitization doesn't happen overnight — it's a step-by-step process of leveraging technology now to build toward a more optimized future state.

An impactful place to start is by transforming vegetation management programs through digitization, data-driven decision-making and network-wide risk assessment. Taking the plunge with these programs positively impacts multiple profitability drivers, such as optimizing O&M budgets, reducing costly liabilities, and maintaining better SAIDI and SAIFI scores with fewer outages.

“The energy transition requires spending, but we need to keep customer bills as low as possible,” Geller says. “If we can modernize vegetation management and reduce one of the biggest utility expenses, it moves us one big step closer to achieving that balance.”

If we can modernize vegetation management and know how to allocate resources better, that results in more budget available to enable decarbonization.

Greg Geller

FOUNDER AND CEO,
STACK ENERGY

Innovative vegetation intelligence technology and actionable insights build a foundation for profitability in today's constantly evolving landscape. They empower utilities to proactively achieve their greatest goals: improved budgeting, risk management, safer communities, and — most importantly — reliable power.

[Schedule a demo](#) with Overstory to learn how utilities are using actionable vegetation intelligence to provide safer, more reliable power.



An aerial photograph of a mountain valley. In the foreground, a river winds through a town with various buildings and parking lots. A multi-lane highway runs parallel to the river. The middle ground shows rolling hills and more of the town. In the background, large, rugged mountains rise under a clear sky. The lighting suggests late afternoon or early morning, with a warm glow on the right side of the image.

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Overstory provides actionable vegetation intelligence for safer, more reliable power. Our software helps utilities optimize resources, mitigate vegetation risk, and future-proof their operations and maintenance programs for the greatest climate and market challenges of our time. By combining artificial intelligence with remote sensing data around transmission and distribution corridors, we show utilities where they should direct pruning efforts to best minimize the risk of wildfires and power outages across their network.

[Learn more](#)