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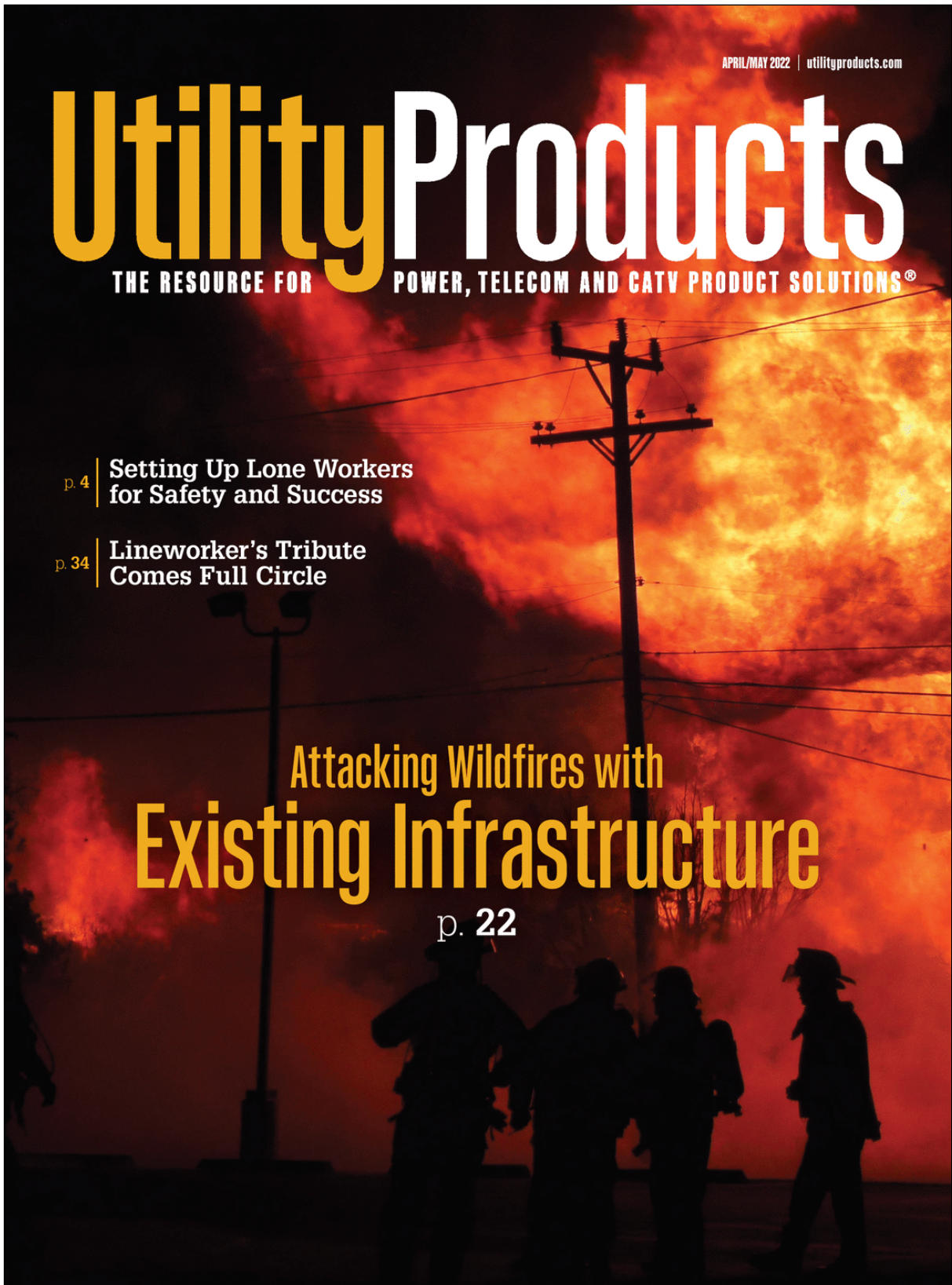
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Leveraging Existing Grid Architecture to *ATTACK WILDFIRES*





BY W. ALAN SNOOK III, GRID 20/20

The idea that wildfires are seasonal is fading, with fires occurring during summer, fall and now even winter months. Urban damage and destruction from fires are no longer an occasional matter but rather recurring events that demand more attention from utilities.

It all starts with a basic understanding of electric grids. Specifically, that existing distribution grid

architecture is ubiquitously deployed throughout local communities. Typically, the density of transformers within a localized distribution grid is commensurate with the density of people, businesses and institutions in the community. Populous areas are precisely where increased wildfire protection is needed.

Each overhead transformer presents a unique opportunity for improved public safety, by capitalizing

on the location, height and density of existing transformer fleets. Specifically, existing overhead distribution transformer fleets present an opportunity to establish a community-wide wildfire sensor network, an emerging solution to help utilities improve public safety protection.

Wildfire Sensor Network

While no single solution is going to solve all wildfire woes, it is important to note that multiple solutions operating synergistically can deliver tremendous value. Increased vegetation management efforts, more frequent electric grid inspections and occasional public safety power shutoff (PSPS) actions have been implemented. However, it is painfully evident every year that more robust solutions are necessary when it comes to increasing public safety protection and reducing wildfire destruction. One emerging solution allows utilities to use their existing grid architecture.

By leveraging the height, location and density of existing overhead transformers, field sensors can be used to create an overarching community-wide canopy that monitors certain atmospheric and environmental conditions (that is, outdoor smoke/gas, ground-level fire, ambient temperature and humidity). One such example, Grid2020 Inc. has developed always-on, outdoor wildfire sensors that can be deployed quickly on overhead transformers to mitigate wildfires.

Using cellular communications, the GRIDWIDE FIRE-SPY sensors simultaneously deliver early detection of wildfires, automated alerts, ongoing situational awareness and certain wildfire prevention capability. By leveraging existing grid infrastructure, this emerging solution not only adds a protection level that benefits the community and local economy, stakeholders and the environment

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Early detection and automated alerts are instrumental to getting timely notification of a potential event.

but also reduces future wildfire cost impacts.

Ask any first responder what the key is to fighting wildfires: Beyond the obvious response of prevention comes the response of timely notification. In other words, time is key, time is money, time is life. Time is everything when it comes to fighting wildfires. A timely notification typically is the difference maker between thwarting a disaster and battling one (and then paying for it). Early detection and automated alerts are instrumental to getting timely notification of a potential event.

With an emerging solution like the community-wide outdoor wildfire monitoring canopy, utilities can capitalize on what they already have at their disposal — a wildfire mitigation framework that leverages their existing transformer fleet for proactive community-wide protection.

Wildfire Season

The seasonality of wildfires is diminishing, as fires have become a perennial occurrence. Recent history has proven ongoing vigilance is necessary and more robust wildfire mitigation

solutions are needed. Following are some notable wildfire impacts that have occurred during different times of the year over the last five years:

2022

- California Big Sur's Colorado Fire burned 687 acres (278 hectares).

2021

- Colorado wildfire incident destroyed 1000 structures and required 35,000+ people to be evacuated.
- California's Dixie Fire was the second largest event in state history, with 700+ homes destroyed and 963,309 acres (389,837 hectares) burned.
- Across all wildfires in California, 3629 structures were destroyed and 2.6 million acres (1.05 million hectares) burned, resulting in three fatalities.

2020

- This was California's largest wildfire season on record, with 4.4+ million acres (1.7+ million hectares) burned.
- Oregon saw at least 11 fatalities, 4000+ structures destroyed, and US\$609 million in losses.

2018

- California's Camp Fire resulted in 85 fatalities, 18,804 structures destroyed and \$25.5+ billion in losses.
- British Columbia has its largest wildfire season, with 3.3+ million acres (1.3+ million hectares) burned.
- California had nearly 100 fatalities and over 22,000 structures destroyed.

2017

- California's Northern Fires resulted in 44 fatalities and 8900 structures destroyed.
- British Columbia's worst wildfire season at the time, with 65,000 evacuated due to fires.

This abbreviated list of wildfire-inflicted disasters is merely the tip of the data iceberg when it comes to wildfire incidents, acres burned, structures destroyed, fatalities and injuries incurred, and related costs. It is now apparent the so-called wildfire season is expanding. In California, the wildfire season increased by upwards of 75 days in 2021, according to the California Department of Forestry and Fire Protection (CAL FIRE). Then came the Colorado Fire on Dec. 30, 2021.



Given the ongoing increases in annual ambient temperature, expanded and extended drought conditions, and more frequent windstorms, it seems there is no longer a conveniently definable wildfire season.

Related Costs

Estimated wildfire costs in the U.S. in 2020 were \$114.2 billion. Annually, wildfire destruction represents billions of dollars in losses. Think about that: Billions of dollars every year are required from somewhere to pay for wildfire aftermaths. A single fire, the 2018 Camp Fire in Paradise, California, resulted in an estimated \$25.5 billion in losses.

Wildfire suppression costs alone require hundreds of millions and sometimes even billions of dollars each year. Oregon's suppression costs topped \$354 million in 2020. The Camp Fire incident exceeded \$150 million in suppression costs.

In addition, tens of thousands of firefighters and first responders are put at risk each year to address ongoing wildfires. For



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example, approximately 5600 firefighters were dispatched to the 2018 Camp Fire event.

Yet, while post-event insurance monies, legal settlement monies, and local, state and federal funding support are helpful, nothing truly replaces what is lost because of wildfires — whether it be human loss, material and property loss, or environmental loss. However, money is always an important element in the wildfire equation because annual wildfire costs are staggering.

(table) Estimated wildfire damages in the billions over five-year period.

Sources: Insurance Information Institute, Choose Energy Inc., Eisenbach Consulting LLC.

Local, state, and federal governments have been burdened substantially by the combination of ongoing wildfire suppression costs and post-event rehabilitation costs. In some cases, wildfire costs and collateral impacts on local economies have demonstrated the potential to severely

impact local, state and even federal budgets. Notably, the economic impact loss and related tax revenue loss that ensues from wildfires.

All these recurring wildfire-induced cost impacts result in tax increases, insurance premium increases, cost of material increases and more. These increases must be factored into the overall costs associated with wildfires. Although, regardless of how helpful it is to receive post-event funds from any source, no amount of money truly restores people's lives, their homes and the environment following a disastrous event.

It is clear additional steps need to be taken to decrease wildfire impacts and try to prevent more wildfires from occurring. Utilities must reduce the size, scope and frequency of these events.

GHG Emissions

Ongoing messaging from federal and state authorities, academia, environmentalists and climate activists



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indicates greenhouse gas (GHG) emissions must be curtailed. From coal plant closures to coal-generated electricity plant decommissioning, to electric vehicles adoption, etc., steps are being taken to reduce GHG emissions, typically in the form of carbon dioxide. Increasing average ambient temperatures, prolonged droughts, increased windstorms and wildfires are now commonly attributed to climate change conditions.

(table) Recent wildfire-induced GHG emission estimates for the U.S.

Sources: Insurance Information Institute, Choose Energy Inc., Eisenbach Consulting LLC, U.S. Department of Transportation.

Using this environmental understanding as a foundation, it is clear wildfire mitigation must be actively addressed at more serious levels. Annually, wildfires churn out massive

levels of carbon dioxide into the atmosphere. Plumes of smoke and ash sometimes travel hundreds of miles and even enter the jet stream to travel greater distances. Think about it: Almost every year, wildfires cause as much GHG emissions as nearly one-fifth to one-fourth of the U.S. auto fleet's annual GHG emissions.

Therefore, it is evident wildfires are part of the challenge in the fight against harmful GHG emissions, given they are substantial annual contributors of these emissions. This reality is yet another critical reason why the electric utility must introduce more robust wildfire mitigation solutions. Emerging technologies, such as GRIDWIDE FIRE-SPY, can help to reduce GHG.

Thinking Bigger

It is time for utilities to start thinking bigger when it comes to wildfires.

Whether it be the massive annual cost burdens, environmental damage, GHG emissions impacts, and loss of life and injuries associated with these events, utilities must now maintain focus perpetually on this problem. Year after year, wildfire events have proven worst-case scenarios are becoming commonplace unfortunately. And, these events are occurring in the summer, fall and even winter. In turn, utilities certainly need to become more vigilant about expanding wildfire mitigation solutions, efforts and awareness.

Once upon a time, people did not wear seat belts. Now, virtually everyone does. Once upon a time, few people had smoke detectors in their homes. Now, virtually everyone does. At present, community-wide outdoor wildfire monitoring canopies are merely an emerging solution.

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However, in due time, as with the adoption of seat belts and in-home smoke detectors, outdoor wildfire mitigation sensor solutions will become commonplace for utilities.

Perhaps the real question is this: How much cost burden, environmental damage and loss of life will justify this proactive approach?

As utilities contemplate where and when to deploy community-wide wildfire monitoring solutions, they also must consider the exceptional mental anguish and anxieties that ongoing wildfire risks present. Given the frequency and magnitude of wildfire events recorded



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to date, surely utilities have seen enough. Now is the time to begin the proactive process of further enhancing wildfire mitigation and public safety efforts by leveraging existing

distribution grid assets to get there. ●

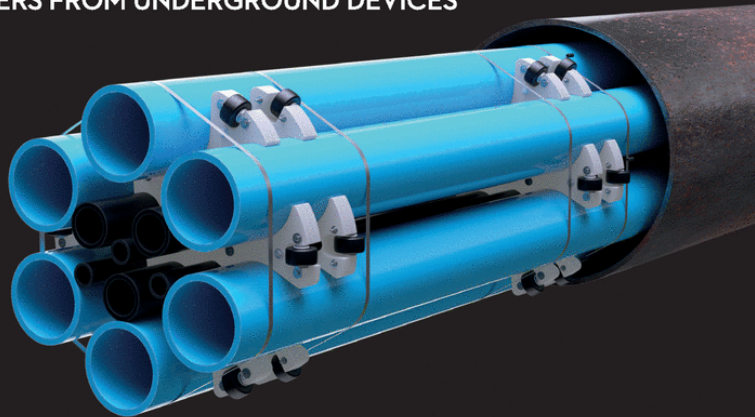
THE AUTHOR: Alan Snook (alan.snook@grid2020.com) is co-founder and president of GRID20/20, Inc. founded in 2011. Under Alan's leadership, the company is now transitioning toward Public Safety Protection Solutions. The company's leading initiative is GRIDWIDE FIRE-SPY; a wildfire mitigation solution that leverages existing grid architecture

and capitalizes on the company's lengthy intra-grid sensor history. GRIDWIDE FIRE-SPY represents an emerging subsidiary movement of the company.

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