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California burning: Inside the quest to power homes—and fight wildfires

The dead trees that make wildfires catastrophic could be a valuable source of renewable energy. But public health groups say it's a risky proposition.

A member of a forestry crew builds a pile of cleared trees to later burn at a fire prevention project south of Truckee, Calif.
Brian Dabbs
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Brian Dabbs @briandabbs
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YUBA COUNTY, Calif.—In 2020, Sheri Elliott, the former Forest Service budget director, looked out from her deck near the Tahoe National Forest to see flames raging from the North Complex fire.

Elliott consulted a map and determined she didn't need to evacuate. The New Bullards Bar Reservoir stood in the way of the encroaching inferno.

Just weeks ago in late June, the Rices fire blazed miles to the west of her North San Juan home, sending flames and huge plumes of smoke into the royal-blue northern California sky. Elliott and her husband, who uses heavy machinery to render their property fire-safe, nearly evacuated before authorities deployed tankers to drop retardant and hotshot crews to stifle the flames.

Retired from the Forest Service in 2017, Elliott is still working doggedly to mitigate the increasingly ferocious fires in northern California that threaten her property and that of countless others.

And she's digging in on one often overlooked area of fire-prevention strategy: the construction of new electricity plants that run on highly-flammable wood removed from the forest. Supporters of biomass electricity say the build-out of new plants like the one Elliott is pursuing will help power homes and strip the forests of the stuff that makes wildfires increasingly catastrophic.

Elliott is a board member of the Camptonville Community Partnership, an organization that seeks to revitalize a remote region west of Tahoe National Forest. In that role, she's shepherding through a new biomass power plant on a 100-acre property purchased recently from Sierra Pacific Industries just around the corner from the New Bullards Bar Reservoir.

Similar to natural gas and coal, biomass plants burn organic material like wood and agriculture waste to boil water, which then produces steam to spin turbines and create electricity.

California's tinderbox fires

The pine-and-fir-forests in northern California and across the West are perilously overstocked due to Forest Service policy dating back generations to suppress fire at all costs in order to allow new towns and cities to thrive. Climate change is fueling rising temperatures and unprecedented drought, making the forests tinderboxes. Four of the 20 largest fires in California history took place last year. Fires are currently blazing in the state from Yosemite National Park to Shasta County.

And now, the Forest Service needs to remove the dead and dying vegetation, known as hazardous fuels, to mitigate the fire risk.

To do that, the Biden administration selected the Yuba River region of the Tahoe National Forest for the first tranche of more than $3 billion in wildfire funding from the bipartisan infrastructure law passed last year. The North Yuba Forest Partnership, an electric mix that brings together the Forest Service, the National Forest Foundation, Elliott's Camptonville organization, and others,

is implementing a laundry list of forest-management projects to thin the forests of millions of tons of hazardous fuels.

Elliott wants to use that waste to power homes and businesses.

“This is literally in the backyard of those projects,” she told *National Journal* from the site just off a local highway where pines, star thistle, dog-tail grass, and sunflowers grow and a Pacific Gas and Electric transmission line runs nearby.

“If you pencil it out, you can make money on these facilities. And particularly this one should be able to make money with the feedstock so close by. But the margins are very narrow,” said Elliott, who wore a Smokey the Bear T-shirt.

The biomass facility is a dozen years in the making. In late June, contractors started to drill on the site to gauge the soil. The goal is to produce biomass power in 2024. Elliott is now courting investors.

Meanwhile, the infrastructure law appropriated $400 million in financial assistance for facilities that “purchase and process byproducts from ecosystem restoration projects.”

Elliott hopes to get a piece of that.

“We might need to start really knocking on some doors and figuring out what the agency is really doing with this because I feel like we fit right in,” she said.

A Forest Service spokesperson, Michelle Burnett, said $7.5 million of that $400 million was deployed in late May to support an affordable-housing project unrelated to biomass power. The agency is now working to roll out new funding opportunities for the rest of the financial assistance, Burnett said. Biomass-power projects could access that funding.

Sheri Elliot and Forest Service employees discuss fire prevention at a high-altitude meadow near Bassetts, Calif. Brian Dabbs

Speeding up forest management

Groups that implement the forest-management work, like the National Forest Foundation, a national nonprofit partner to the Forest Service chartered by Congress in 1990, now have to drive long distances to dispose of hazardous fuels they clear from the forests. And the market for timber has plummeted in recent decades, making it harder to encourage foresters to remove those fuels to begin with.

In November, the NFF contractor Robinson Enterprises, Inc., based out of Nevada City, California, cut down tens of thousands of lodgepole pines as part of the Forest Service's French Meadows project near a small town named Bassetts high in the Tahoe National Forest mountains. The project aims to restore meadows and Aspen populations and mitigate fire risk. Now, NFF is organizing the transport of 16,000 tons of the pines, which lay in a towering pile in the middle of a cleared-out strip of forest, to the Honey Lake Power biomass plant 120 miles away.

“The export of that and the transporting fee of that to Honey Lake is pretty exponential. We just increased their cost to perform this work by another $300,000 just due to the fuel,” Carson Clark, an NFF forestry supervisor, told *National Journal* at the site.

He said the Camptonville facility will be “a lot closer” and “a lot cheaper for transportation.” Elliott’s site is 40 miles from the French Meadows project.

In the 1800s, prior to the industrial revolution that powered homes with coal-fueled electricity, the U.S. relied almost exclusively on wood combustion for heating, cooking, and lighting needs. Now, wood biomass generates less than 1 percent of electricity on the power grid.

“You are seeing massive forest-fire risk out west, that increasing severity of forest fires season over season. And at the same time, you’re seeing biomass power facilities struggle,” said Carrie Annand, executive director of the national Biomass Power Association. “We hope to see things turn around. We believe strongly that biomass is an important tool in addressing wildfire risk and reducing the risk.”

According to Annand, several biomass facilities that use hazardous fuels are on the verge of shuttering in part due to cheap natural-gas electricity and increasingly cheap wind and solar production.

Those include Rio Bravo Fresno in Fresno, California, Biomass One in White City, Oregon, and Novo Power in Snowflake, Arizona. Annand is pushing the Environmental Protection Agency to allow biomass electricity to participate in the national Renewable Fuel Standard, a law that forces biofuel blending into gasoline. An EPA spokesperson, Shayla Powell, said the agency is exploring new rules to expand the RFS. She declined to comment on timing for a new regulatory proposal.

Since 2017, lawmakers in Washington D.C., led by Sen. Susan Collins of Maine, have included language in appropriations bills to designate biomass as carbon-neutral, which can allow facilities to qualify for clean-energy programs.

“Recognizing the carbon neutrality of biomass not only aligns with the science, but also encourages investments in working forests, bioenergy, wood products, and paper manufacturing,” Collins said in a statement.

Boosting biomass

In California, a 2012 law was signed to force utilities to incorporate small-scale biomass, like Elliott’s Camptonville project, into renewable-energy mandates. Experts say PG&E, the power utility that serves the majority of California north of Los Angeles, has frustrated biomass-infrastructure build-out.

“The utilities in California are very, very slow at the process by which these facilities can actually connect to the grid and start selling their power,” said Daniel Sanchez, an assistant professor at University of California (Berkeley) who helps run the institution’s Woody Biomass

Utilization Group. “Pacific Gas and Electric is kind of notorious for this, having 18-24-month timelines to even get a quote about how much interconnection is going to cost. And then there’s no ability to negotiate a quote.

“I think everyone in the state is pretty fed up with the way that Pacific Gas and Electric, in particular, is doing interconnection for these facilities,” he said.

The Camptonville Community Partnership needs to pony up $2.5 million to connect the biomass facility to the grid.

A PG&E spokeswoman, Lynsey Paulo, declined to comment directly on the criticisms voiced by Sanchez.

“PG&E strongly supports California’s clean energy policies, renewable energy goals and efforts to limit and adapt to the impacts of climate change,” said Paulo. “PG&E has over 260 Renewables Portfolio Standard-eligible power purchase contracts including 42 bioenergy contracts, representing over 390 MW of capacity.”

Paulo said the utility typically gives interconnection-cost estimates to new developers within a year after studying necessary grid upgrades in line with California state and Federal Energy Regulatory Commission rules.

“Historically, there have been a few projects that have taken longer than six to 12 months, but in such cases there typically was a back and forth between PG&E and the applicant to ensure PG&E fully understood the operational characteristics of the generator in order to produce an accurate study,” she added.

A separate California regulation, stemming from a 2015 emergency order, requires utilities to bring on some bioenergy produced at larger-scale facilities that use hazardous fuels removed from the forest. Julee Malinowski-Ball, executive director of California Biomass Energy Alliance, said PG&E has been more supportive of that program.

“If it weren’t for this program, those facilities probably wouldn’t be operating today because their contracts would have expired and they would have had to compete … with significantly less expensive wind and solar technologies, which are more subsidized and just simply cheaper,” she said.

A towering pile of cleared pine at the French Meadows project will soon be transported to the Honey Lake Power biomass plant. Brian Dabbs

‘There are other ways to generate energy’

Advocates say biomass power, equipped with pollution controls, emits far less particulate matter—a common cause of asthma, cancer, and other pulmonary health hazards—than wildfires and forest pile-burning, which the Forest Service and its forestry allies often do to dispose of cleared hazardous fuels. A 2011 study published by the *Journal of the Air & Waste Management Association* concluded that biomass produces 98 percent less particulate matter than open pile-burning and 17 percent less carbon dioxide.

In its State of the Air 2022 report, the American Lung Association, a major public-health organization that focuses on air quality and related health impacts, called wildfires a “growing threat to public health” that pollute “the air breathed by millions of people.”

Over recent years and decades, the group has increasingly spotlighted concerns about the particulate-matter threat.

“We’ve seen this transcontinental event that we had in the summer of 2021, where we saw Western wildfires impacting eastern cities and everywhere in between,” said Paul Billings, a senior vice president at the American Lung Association who’s been with the organization for more than three decades. “I’d say the last five to seven years have seen a real marked shift in how much attention we’re paying to wildfire in our report and sort of the day-in, day-out.”

But the ALA opposes biomass for electricity, arguing that the smokestacks at the plants emit harmful pollutants that pose too many health risks for local residents. “We do not want to be creating more biomass infrastructure for electricity generation. We want to transition to clean, non-combustion, renewable electricity,” he said.

“We also know that biomass plants are not well controlled for pollution and they can be a day-in, day-out threat to the communities that are nearby and downwind. And they’re frequently low-income and communities of color,” he added. Biden administration plans to rapidly build out clean energy took a major hit last week after moderate Sen. Joe Manchin quashed budget-reconciliation efforts to give big tax breaks for wind and solar developers.

Jonathan Buonocore, a former researcher at Harvard University who is now an assistant professor at Boston University School of Public Health, has also been sounding the alarm bells about biomass. Last year, he published a paper that argued biomass caused at least 18,000 deaths—far more than the pollution-related deaths linked to coal power plants.

“There are other ways to generate energy that don’t involve burning stuff. And those are probably going to be better for health,” he said.

For utility-scale electricity generation, particulate-matter emissions tied to coal and natural gas far outweigh biomass, according to the EPA.

In 2017, the most recent year for EPA National Emissions Inventory data, biomass electricity produced 1,609 tons of particulate matter. Coal, which makes up 22 percent of utility-scale electricity in the U.S., produced more than 74,000 tons. And natural gas, the leading electricity fuel at 38 percent, produced more than 24,000 tons. Meanwhile, wildfires emitted a whopping 1,655,211 tons of particulate matter in 2017, according to the EPA.

The debate over biomass is likely to continue to rage on from the community level to the halls of Congress. The Biomass Power Association’s Annand says more federal and state policy should acknowledge—and reward—the contributions biomass makes to the fight against wildfire.

“It’s energy production and resource management. But we only get paid for the first part of that,” she said.

But biomass power faces a steep uphill climb to claim more of the electricity market. Elliott said the Camptonville plant will only process 40 tons of woody material annually, just a fraction of the 16,000 tons of lodgepole pine cut down at the French Meadows project site near Bassetts.

“It’s not the answer. It’s just part of the answer,” she said.

This is the second story in National Journal*'s four-part series, "California burning," which explores the federal strategy to tackle wildfires ravaging the western U.S.*