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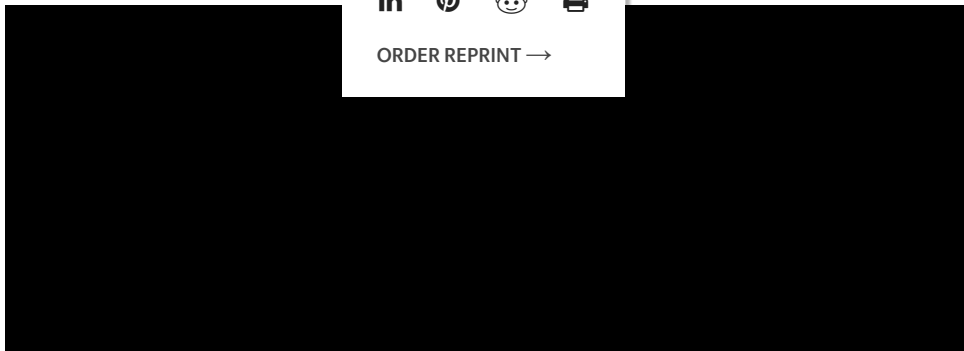
Slow Burn: Europe uses tons of NC trees as fuel. Will this solve climate change?

BY SAUL ELBEIN

JANUARY 03, 2020 10:18 AM



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ACCEPT COOKIES

Maryland-based Enviva opened its first wood pellet plant in North Carolina in 2011. It now has four and produces millions of tons of pellets a year, all for export.

BY ETHAN HYMAN, MICHAEL FRIERSSON WITH THE PULITZER CENTER

More from the series

Wood pellets, climate change and North Carolina

This series on the wood pellet industry and the different views on the role of North Carolina forests in combating climate change took six months to put together, but drew on years of experience and reporting. It was produced in partnership with The Pulitzer Center on Crisis Reporting.

EXPAND ALL ▼

From the outskirts of Selby, a 1,200-year-old former coal-mining town in northern England, you can see the smokestack and the dozen cooling towers of the Drax Power Station, the largest power plant in the United Kingdom.

For much of its 45-year-history, Drax burned coal mined from the nearby Selby coalfield. But the last coal mine closed in 2004 and now Drax says it has gone green — with help from the trees of North Carolina.

Thousands of acres' worth of North Carolina trees have been felled, shredded and baked into wood pellets, which have mostly replaced coal as Drax's fuel.

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In a corner of Drax's 400-acre compound are four metal silos, each larger than London's Albert Hall, according to the company's website. That's where 300,000 metric tons of wood pellets — also called biomass — are stored. A dozen 25-car trains arrive daily, delivering 20,000 tons a day, six days a week.

What makes biomass good for the environment? It has to do with carbon dioxide, the odorless, colorless gas most responsible for climate change.

Wood, like coal, is mostly carbon. The thinking is, if you burn wood and plant a new tree, the new tree will absorb the carbon dioxide given off when you burn the old one. If you burn coal, the CO₂

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written for Nature, Timothy D. Searchinger, a Princeton University forest economist, and a handful of other researchers said that [wood pellets give off 1.5 times as much carbon dioxide](#) as coal per kilowatt hour and three times as much CO₂ as natural gas. Drax disputes that figure, saying that stack emissions of CO₂ at its facility are only about 3% higher than coal.

And even if a new tree is planted for each one burned, the scientists say, it would take decades for a new tree to absorb the CO₂ released by burning the old one. The consensus among climate scientists is: We don't have that much time.

Over the past six months, The News & Observer, with support from the Pulitzer Center for Crisis Reporting, has been examining the wood pellet industry and its effect on North Carolina, which according to the U.S. Energy Information Administration, will soon produce and export [more wood pellets than any other state](#).

THE EU HAS ENDORSED WOOD PELLETS

In 2009, members of the European Union agreed to obtain 20% of their energy needs from renewable sources by 2020.

About half of those "renewables" are the familiar ones: wind, solar, tidal, hydropower. But the other half is biomass: energy derived, ultimately, from plants. In the case of Drax and other converted coal plants in Denmark and the Netherlands, biomass means energy that comes from trees.

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LOCAL

How this project was reported

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For European power plants facing a continental commitment to getting off coal, biomass provided a convenient fix. The EU plan designated biomass as "carbon neutral," meaning it doesn't emit any new carbon into the atmosphere. That declaration was based on the "burn-a-tree, plant-a-tree" equation.

The result was that the wood pellet industry, the main export form of solid biomass, has boomed. Biomass exports have increased tenfold since 2009, according to the U.S. International Trade Commission. In 2010, the U.S. Southeast exported about 500,000 metric tons. By 2018 that had surged to 6.5 million metric tons (about 7.1 million U.S. tons).

And that's only the beginning: The industry has big plans for expansion. Drax owns pellet mills in Louisiana and Mississippi and has two shipping terminals on the Gulf Coast to direct wood pellets to its terminals in England. But it largely relies on Enviva, a Maryland-based company that is the world's largest pellet producer; Enviva says it has [a contract with Drax](#) to supply 650,000 metric tons of pellets a year through 2026.

Enviva built its first pellet plant in Ahoskie, N.C., in 2011. Today it owns eight plants, four of them in North Carolina. When expansions already approved by the state are complete, those four plants will be able to produce almost 2.5 million tons of wood pellets a year.

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Wood pellet manufacturing plants in North Carolina

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In a June investor call, Enviva CEO and cofounder John Keppler announced that the company

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As nations around the world continue to take major steps to combat climate change, Keppeler told investors, “Enviva is addressing the problem today, helping reduce the life cycle of greenhouse gas emissions of major utilities.”

CLOSING THE CARBON CYCLE LOOP

Jason Shipstone is the vice president for innovation at Drax and has led the plant’s continuing conversion from coal to biomass. In an interview in July, Shipstone sat in an office trailer on the Drax compound and pointed to a poster on the wall, a depiction of how logging in North Carolina is supposed to help Europe slow climate change.

“You burn the CO₂ that a tree (absorbed) as it grew,” Shipstone said, his index finger transcribing the closed loop of the carbon cycle, “and then you plant new ones.”

“What’s the stat?” he continued. “Right. What we emit here in an hour, the growing forests in the United States absorb in a minute.”

To many scientists and land activists, however, biomass is a fast train moving in the wrong direction.

Trees cut down on a Wilson County farm are brought to a loading area Tuesday, Sept. 3, 2019. The cut trees are headed to the Enviva plant in Northampton County, N.C. Ethan Hyman EHYMAN@NEWSOBSERVER.COM

“It’s so simple I feel stupid repeating it over and over,” said [Mary Booth](#), a former Woods Hole Research Center and Columbia University ecologist whose [Partnership for Policy Integrity](#) organization has been a principal critic of the biomass industry. “Carbon can be in one of two places: It can be in the atmosphere or tied up in forest biomass. In the atmosphere, it warms the atmosphere just as effectively as fossil fuel carbon.

“So if you want to maximize the amount held in trees, and minimize the amount held in the atmosphere, then stop burning trees.”

ARE FORESTS DAMAGED? OR MANAGED?

Scientists on both sides of the Atlantic point out another cost of using biomass: the trees that were otherwise growing and would have continued to grow, sopping up carbon from the atmosphere. Those trees also would have moderated the local N.C. climate, filtering its water and buffering the state from the effects of a climate that’s already changing, causing more intense storms and worse flooding.

In 2010, as Massachusetts was set to follow Europe in extending renewable energy credits to the state’s nascent biomass industry, Booth and a group of Massachusetts scientists and activists lobbied for a study on biomass and carbon neutrality.

The so-called [Manomet study](#) found that biomass couldn’t always be called carbon neutral: It depended on the kind of materials harvested, how they were replanted, and what they replaced. For example, a forest that grew back exactly as it was, replacing coal, could pay back its “carbon debt” in 21 years, the study found. If it replaced natural gas, it would be more like 90 years.

Subsequent studies have revised these numbers upwards. John Sterman of the Massachusetts Institute of Technology, for example, found that even if forests replaced coal, it would take 80 years to recapture the carbon released when the wood was burned.

Based on the Manomet report, then-Massachusetts Gov. Deval Patrick pulled renewable energy subsidies from the state’s biomass-to-electricity industry. Unable to compete against other carbon-based fuels — coal, fuel oil and natural gas — the state’s biomass market largely collapsed.

In North Carolina, the Cooper administration’s new [Clean Energy Plan](#) cautions against “large scale use of North Carolina natural resources to meet foreign markets’ carbon reduction goals.”

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In Europe, policymakers extended a blanket label of carbon neutrality to biomass, unlocking subsidies for wood pellets. In 2018, [Drax alone received about \\$1 billion](#) in subsidies from the British government, CNN has reported. The second Renewable Energy Directive, approved in 2018, established limited protections for old-growth forests and rules to avoid the conversion of forests into cropland. But that doesn't prevent either the clear-cutting of bottomland hardwood or its replacement with planted stands of pine.

NORTH CAROLINA HAS LOST BOTTOMLAND FOREST

Over the past decade, according to data from the United States Department of Agriculture, North Carolina has lost 120,000 acres of bottomland hardwood — an area about 20 times the size of the Triangle's Umstead State Park.

Where did these trees go? It's hard to say. Logging is a complex business; and determining why any particular stand was logged is almost as hard as saying whether any particular hurricane has been caused by climate change, said University of North Carolina biologist Alan Weakley.

But over that time, the pellet industry has expanded across coastal North Carolina, fueled by the European subsidies and the indirect benefit that EU carbon accounting rules allowed, not having to count the carbon dioxide that came out of their smokestacks.

In 2011, when Enviva established its first plant in Ahoskie, it began buying up all the cheap timber that other industries weren't using, grinding it up into chips and pressing it under heat until it melted into something like kibble. Then it went by truck to the coast where it was shipped to power plants like Drax.

This meant a boom for local loggers. As early as 2013, The Wall Street Journal [found](#) that the pellet industry had brought clear-cutting back to the bottomland forests of Eastern North Carolina, leveling private tracts of 80-year-old trees in regions where forests had been recovering thanks to industries like newspapers moving away from paper and as a result of the overall economic downturn. Those changes cut back the local paper industry, once the prime customer for bottomland hardwoods.

SUBSIDIES HAVE "DISTORTED THE MARKET"

The pellet industry says it uses only what the rest of the wood products industry doesn't, and it is certainly dwarfed in output by the pulp and paper industry. But critics point out that biomass is the only wood-products industry receiving subsidies on the basis of its ostensible carbon benefits.

According to a 2017 report commissioned by the American Forest and Paper Association, [pellet subsidies had "distorted" markets](#) in the Southeast, allowing the pellet industry to pay two-to-five times as much as its competitors for pulpwood. "Without these subsidies," the report says, "pellet plants would lose money given ... current market price."

In 2016, three paper companies filed a formal complaint with the EU about Drax's subsidized conversion to biomass, arguing that the burgeoning pellet industry posed a risk to the American forests their industry depended on, "lead[ing] to unsustainable environmental practices."

Trucks line up to bring logs to the Enviva plant in Northampton County, N.C. Tuesday, Sept. 3, 2019. Enviva is the world's largest producer of wood pellets, Ethan Hyman EHYMAN@NEWSOBSERVER.COM

Pellet industry supporters at Enviva and elsewhere say that their critics have overly simplified a complex issue. They point to [their own efforts](#) to trace where their trees come from and to ensure that property owners plant new trees to replace the ones harvested.

"Enviva itself will not contribute to deforestation," Jennifer Jenkins, the company's vice president of sustainability, said during a public hearing last summer over the expansion of the company's Sampson County plant. "We simply don't purchase wood from a tract that won't be returned

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wrote, land owners would be less likely to plant more trees.

Bob Abt, an N.C. State University forest economist, said Jenkins was conflating a decrease in demand for biomass with a total elimination of demand for *all* forest products — which no one is calling for.

Low-value timber, Abt said, “is an economic category, not an ecological one.” The forest is made of a “portfolio” of products, Abt said, and if — as his models suggest — more products leads to more planting, biomass could, long-term, lead to more trees on the landscape.

PINE PLANTATIONS VERSUS PINE FORESTS

But all forests aren’t equal. The forests that are planted after a harvest are largely pine plantations — they don’t support the diversity of species that a natural forest does. Weakley, the UNC biologist, calls pine plantations “a simplified system,” hospitable to what he called “weed species” like white-tailed deer, and not much else.

To the industry, both “forest” and “deforestation” have precise, technical meanings that are not necessarily the ones understood by the public: According to the U.S. Forest Service, a stand that has been clear-cut still counts as forest, provided that it is not now being used for something else, like houses.

Adam Collette of the [Dogwood Alliance](#), a well-funded advocacy group that has called for an end to foreign carbon subsidies and domestic expansion of the wood pellet industry, said that when [the forest products industry says](#) logging has increased the extent of forests, they often use “inventory” as a proxy for forest size. In the industry, inventory is measured in cubic feet of wood per acre at the time of harvest, not in acres of tree-covered land.

And inventories, in fact, have gone up, thanks to innovations since 1952 in industrial plantations, which pack pine trees into tight rows treated with herbicide and fertilizer. Since trees are made of carbon, an increase in inventory may mean an increase in absorbed carbon as well — as long as the trees remain standing.

But over that time, the size of forest area has stayed flat, according to the USDA, as natural forests are slowly replaced by plantations.

HOW BIG A DEAL IS IT?

Pellet industry advocates often point out they extract a small fraction of what pulp and paper does. And yet, according to Searchinger, the Princeton forest economist who raised an alarm about biomass subsidies in early 2010, wood pellet production has outsized impacts on the land. That’s because wood pellets produce about [16 million Btu per ton](#) — just two thirds as much energy as coal.

Searchinger said that “a small amount of energy requires a gigantic amount of wood. To get up to 2% of additional global energy from wood, you have to double the commercial forestry harvest. So this is just gigantic.”

A worker walks past logs stacked at the Enviva plant in Northampton County, N.C. on Tuesday, Sept. 3, 2019. Enviva turns the logs into cylindrical pellets that will be burned for heat and electricity in Europe. Ethan Hyman EHYMAN@NEWSOBSERVER.COM

Mary Booth and her policy organization, Partnership for Policy Integrity, are coordinating a multinational lawsuit against the EU, charging that the EU’s biomass policy has led to clearing forests critical to slowing climate change. The suit has plaintiffs from six countries, including Kent Roberson, 62, a retired Martin County animal control officer who is the U.S. plaintiff.

He lives in the bottomlands just southeast of Ahoskie, where Enviva established its first plant in 2011. Before the plant went in, Roberson said, his house sat beside a 100-acre forest, much of it the

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The plaintiffs are asking to have wood pellets and biomass removed from the EU list of renewable energy sources, which would dry up the subsidies. The suit was filed in [European General Court](#) in Luxembourg in March. It has not yet been heard.

“The point isn’t that the pellet industry caused all of the forest loss,” Booth said. “But even if it’s just one tree we’re burning and calling it carbon neutral, we shouldn’t be paying people to do it. It’s bad public policy.”

And as Searchinger pointed out, the demands on the land are only set to increase. In 2018, the European Union increased its renewable energy quotas by more than half, from 20% by 2020 up to 32% by 2030. And despite lobbying from such groups as the European Academy of Science, the Joint Research Center (the scientific advisory arm of the European Commission) and nearly 800 scientists, the EU declined to end the blanket carbon neutrality exception for biomass, or to put stricter sourcing controls in place.

LOGGING EXPANDS

So Enviva is expanding to meet that demand. A new North Carolina plant in Hamlet, with a production capacity of 625,000 tons per year, opened in June; another, in Lucedale, Miss., aimed at the rising East Asian market, would produce approximately as much wood as all of North Carolina does now. And in a first-quarter 2019 investor call, Enviva representatives announced plans for a projected additional 13 plants throughout the Southeast.

In the absence of clear guidelines from either the EU or North Carolina on which trees or tracts of land can be harvested, what is left is anecdote, and the land itself.

Jeff Turner is a waterkeeper with the Waterkeeper Alliance on the Blackwater-Nottaway River, which drains into Albemarle Sound. He said Enviva gave a presentation to his organization when it built two mills in 2012 astride the North Carolina-Virginia border. “They said they would only be taking scraps and waste,” Turner said. “That’s what persuaded us not to fight them, for all the good it would have done.”

In the subsequent years, he said, he would drive by the new mill in Franklin, Va., and see piles of whole tree trunks waiting to be fed into the chipper.

A two-inch rain, he said, now spikes floodwaters as much as a four-inch rain did a decade ago—an anecdotal report that mirrors others from the Cape Fear River, downstream from the Enviva Sampson plant, on the other side of the state. There, local river guide Charles Robbins said 2016’s Hurricane Matthew drove stream flows down the Cape Fear to three times what they had been during 1996’s Hurricane Fran. And the flooding after Florence, he said, was twice as powerful as Matthew.

“The storms are getting stronger,” Robbins said, “but there’s also a lot fewer trees to pull water from the river.”

Those forests were not planted for biomass, Booth says. “It’s probably time to do one last clear cut of those lands,” she said, “and return it to natural forest.” Voices as varied as NCSU’s Bob Abt and the Dogwood Alliance have argued that government policies should encourage forest growth over logging.

“Why don’t we subsidize trees like we subsidize corn,” Abt asked, “and just accept there will be some slack in the system?”

On his stand of woods outside of Ahoskie on a recent autumn day, Roberson sat in the horse barn he had built from his own pines, watching the chimney swifts swirl overhead, plucking flies from the sky. Soon the birds would be moving on for the year, he said. “There are a lot of things around here,” he said, “that, give them five years, are going to be gone forever.”

Dead Next

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Saul Elbein is a freelance writer who has spent close to a decade reporting on forests around the world for The Pulitzer Center on Crisis Reporting, which provided financial support for this project.

This story has been edited for clarity since it was first published.

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