2015-10-21-climatecentral-the-american-trees-that-are-electrifying-europe

As the world tries to shift away from fossil fuels, the energy industry is turning to what seems to be an endless supply of renewable energy: wood. In England and across Europe, wood has become the renewable of choice, with forests — many of them in the U.S. — being razed to help feed surging demand. But as this five-month Climate Central investigation reveals, renewable energy doesn't necessarily mean clean energy. Burning trees as fuel in power plants is heating the atmosphere more quickly than coal.

Climate Central reporter John Upton traveled to England and through the U.S. Southeast to investigate both ends of the global trade in wood pellets, interviewing scientists, politicians, policy makers, activists, workers and industry leaders. Europe has long been viewed as the wellspring of climate action. But the loophole that's promoting wood burning is so overlooked, he discovered, that it's unlikely to even be raised during global climate treaty negotiations in Paris this December.

By **John Upton**

Oct. 21, 2015

SOUTHAMPTON COUNTY, Va. - A truck laden with tree trunks pulled into an unloading zone at a dusty mill. The driver stepped out, into the sapping Southern heat. In a single sweep, a crane hoisted the load off his trailer, depositing it atop a much larger stack of trunks. As he drove off for his next load, another truck pulled in behind him, ready to repeat the industrial ritual. This scene plays out all through the day here, day after day. In satellite pictures, the towering mounds of leafless trees — all of them destined to become wood pellets — resemble thousands and thousands of sepia-toned pick-up sticks.

An American company named Enviva, the world's biggest producer of wood pellets for power plants, built this mill near Virginia's border with North Carolina in 2012. It's a noisy amalgam of metal equipment that billows steam over a 120-acre site, which was carved from thick forest. Bulldozers move massive piles of woodchips. Convoys of trucks deliver logs and chips from nearby logging sites. A separate convoy hauls the finished pellets off to a port, to set sail to be burned in foreign lands.

The mill eats through a million tons of wood every year. Mills like it began popping up in rural areas like this in Virginia and North Carolina between 2006 and 2010, spurring logging during an economic downturn. This one opened just outside the city limits of a forlorn town that's home to a modest forest-based industry and a long strip of chain stores. Nearly a quarter of the 8,500 residents of that town, Franklin, Va., live in poverty — double the state average.

But Enviva's young business is thriving. It is now operating, building or acquiring four pellet ports and seven pellet mills, from Virginia to Florida, across to Mississippi and Alabama. The industry's expanding footprint this year reached Louisiana, where a British power company began operating a pellet mill and a wood pellet port. Currently, there are 27 wood pellet mills scattered across the Southeast producing pellets for European power plants, and at least 25 more mills are being planned.

The wood at Enviva's mills, and at all the mills like it, is ground down, heated up, dried out and pressed into hard pellets one to two inches long. So much moisture is baked out of the wood that a ton of tree trunks produces only half a ton of pellets. The wood pellets are trucked from mills to ports along the Eastern seaboard and Gulf Coast, then shipped across the Atlantic Ocean to the U.K., Belgium, the Netherlands and other nations, where they're burned for electricity, pouring carbon dioxide into an overheating atmosphere.

As the world struggles to cope with the flooding, drought, and heat-wave disasters that climate change is amplifying, producing these finger-sized pellets in America and burning them in Europe is throwing fuel on a global climate crisis. The power plants are based in Europe, but it's American forests that are doing the most to feed their boilers.

"The consequences are very serious," said Tim Searchinger, a research scholar at Princeton University whose work focuses on bioenergy. He is a prominent critic of the use of wood energy. "It takes a massive amount of trees to make a very small amount of energy."

Burning wood pellets to produce a megawatt hour of electricity produces 15 to 20 percent more climate-changing carbon dioxide pollution than burning coal, analysis of Drax data shows. And that's just the CO2 pouring out of the smokestack. Add in pollution from the fuel needed to grind, heat and dry the wood, plus transportation of the pellets, and the climate impacts are even worse. According to Enviva, that adds another 20 percent worth of climate pollution for that one megawatt hour.

Felling the trees needed to produce those pellets contributes to climate-changing deforestation. Most of the trees are being cut down in American states where forests lack environmental protections. This is particularly true in the Southeast, one of the planet's most biologically diverse and heavily logged regions.

Scientists and environmentalists agree that wood energy can sometimes help the environment. The main factors that determine whether it could help save the planet — or help destroy it — are the scale of the operation and the source of the wood. Using sawdust and mill leftovers to heat and power a school in a Pacific Northwest timber town may help. Cutting down forests to fuel an international energy market will not.

Take a 360° tour behind the scenes at Enviva

“You do biomass wrong, and you’re going to have big carbon impacts, big ecosystem impacts, big public health impacts,” said Nathanael Greene, director of the renewable energy policy at the Natural Resources Defense Council, an American nonprofit that campaigns against the use of wood pellets in power plants. “It can be every bit as damaging as burning coal.”

The U.S. pellet industry quickly grew too big to rely on logging and sawmill waste. The American logging industry’s ups and downs are rooted in construction sector trends — and experts say it wouldn’t be feasible for Europe’s power plants to depend on an undependable flow of its trash wood. “I can’t see the energy industry having its feedstock affected by a housing cycle,” said Robert Abt, a forestry professor at North Carolina State University. “You just can’t build a significant energy sector from picking up the slash from a cyclical lumber industry.”

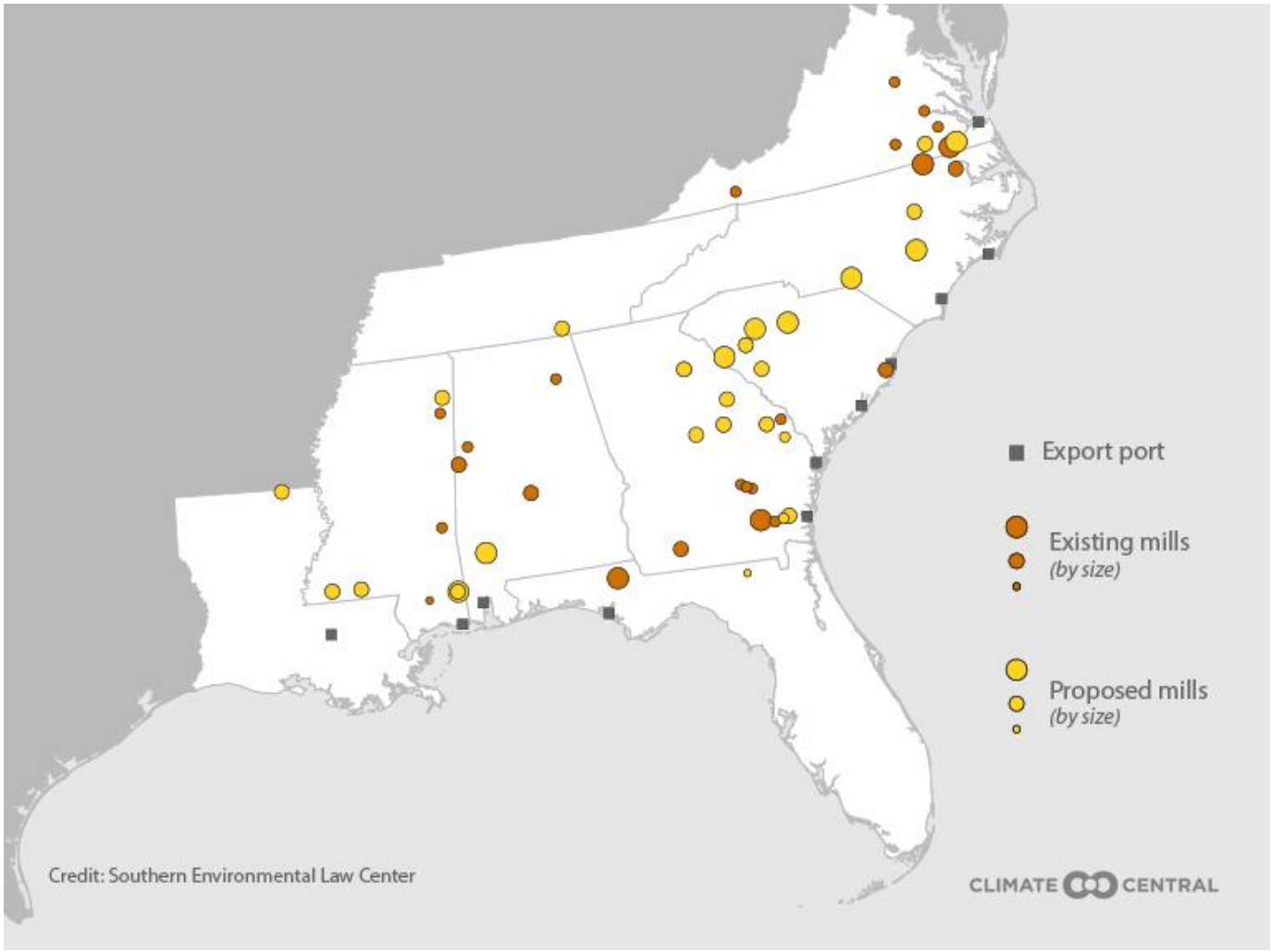
The wood pellet mills are paying for trees to be cut down — trees that could be used by other industries, or left to grow and absorb carbon dioxide. And the mills are being bankrolled by climate subsidies in Europe, where wood pellets are replacing coal at a growing number of power plants.

The subsidies are being spent on wood energy because of an entrenched loophole in European Union energy rules. That loophole treats all wood energy as clean energy, as though it releases no climate pollution.

That artifice is rooted in the fact that trees can regrow, meaning wood energy is considered renewable. Treating wood energy as zero-carbon is an accounting sleight-of-hand, however, that’s plainly rejected by more than 20 years of climate science.

27 Mills Across the Southeast Produce Wood Pellets for Europe

And at least 25 more are on the way



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"The potential consequences of this bioenergy accounting error are immense," a European Union science committee warned in a report in 2011, noting that "more realistic expectations for bioenergy potential are necessary." Exports of U.S. wood pellets have more than doubled since then.

European nations are exploiting the regulatory weak link, sinking hundreds of millions of dollars worth of public subsidies into coal-to-wood conversions at privately owned power plants. That's helping them comply with European climate laws while preserving expensive coal infrastructure — without reducing climate pollution to required levels.

Without the loophole, the pellet mills — which are expanding rapidly south and west of the sector's initial hub in the Southeast — would never have been built. While the growth it's fueling delights many in the forestry industry, it's threatening natural forests in the U.S.

SECTION 2.

Hardwoods = Hard to Replace

Photo by Ted Blanco

The forests of the Southeast have prospered since before the last ice age, spilling over riverbanks and mountaintops in warm and wet conditions, producing one of the planet's richest hotspots of biodiversity. Alligators, black bears, bobcats and other wildlife roam the forests, which cover 200 million acres from Virginia to eastern Texas to Florida.

Those forests are also home to hallmark hardwood trees, from bald cypresses to southern live oaks, flowering dogwoods, red maples, water tupelo and Atlantic white cedar. But to the forestry industry, trees are lumped into two categories: hardwoods and pines.

Treated with pesticides, loblolly pines grow on plantations where natural hardwood forests once grew. The best pines become utility poles. Small and crooked ones, called pulpwood, can become paper or building products. Now, they can also become wood pellets.

Hardwoods are treasured because they're native, fostering the forest wildlife that evolved with them. They grow in the understories of pine plantations. They also flourish on private lands that haven't been planted with pine or vegetable crops or turned into strip malls. Cypresses and other species anchor swampy wetlands. When logged, the finest hardwoods are turned into furniture.

And it's hardwoods that are making up the bulk of many of the wood pellet shipments that are being shipped overseas to burn for electricity. That's not just bad news for natural forests and their ecosystems — it also exacerbates climate change.

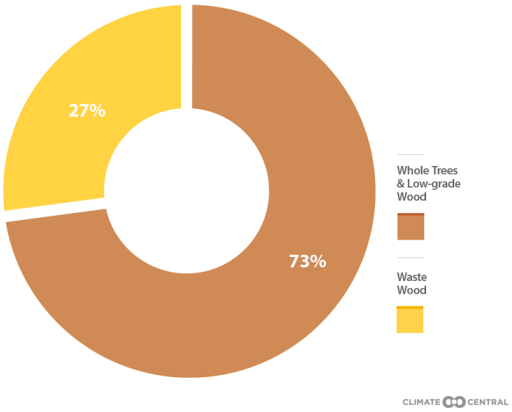
These trees, which were cut down in Virginia, are sorted and sent to nearby mills that produce timber, paper and wood pellets. Photo by Ted Blanco.

Hardwood forests in the Southeast can take a long time to recover; they grow much more slowly than pine. Pound for pound, these hardwoods take longer than pine to absorb carbon from the atmosphere, making the climate impacts worse when they're chopped down and incinerated. To reduce competition with the fluff pulp mill industry — which uses pines to produce the absorbent materials used in everything from diapers to toilet paper and tampons — wood pellet mills across the region are using hardwoods, indifferent to their role in the environment.

The pellets from Enviva's mill are roughly 90 percent hardwood, despite the town of Franklin being surrounded by pine plantations.

"The Southeast U.S. is a tree farm," said Matthew Hansen, a geography professor at the University of Maryland. He led research that used satellite data from 2000 to 2012 that found logging was four times more disruptive in the forests of the Southeast than in South American rainforests. Almost a third of Southeastern forestland was either cut down or regrown during the 12 years studied.[1] "It stands out globally. This is super-intensive use."

Drax Sources Mostly Whole Trees in the U.S. Wood Pellets



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1. Hansen et al. (2013) High-Resolution Global Maps of 21st-Century Forest Cover Change. Source

Many of the hardwood forests being clear-cut in the Southeast now are 40 to 100 years old. Logging for timber and paper increased here in the 1990s when mills were shuttered in the Pacific Northwest after owl habitats received federal protection. No other country or U.S. region produces more wood and pulp every year than the Southeast, where loggers are cutting down roughly twice as many trees as they were in the 1950s.[2]

"These forests haven't been conservation priorities for some of the big national conservation groups," said Stuart Pimm, a conservation ecology professor at Duke University. He worked on mapping research, published in March in Proceedings of the National Academy of Sciences, that identified a "mismatch" in the U.S. between the vast acreage dedicated to parks and other protected areas in the West, and the unprotected Southeast, which needs the parks most[3]. "The biological reality is that the Southeast is extremely important."

Further fueling the boom, some U.S. states are offering tax breaks and other enticements to lure the wood pellet mills. "It's like the movie industry — they offer all sorts of incentives and subsidies," said Louisiana State University agriculture professor Richard Vlosky, who specializes in wood-based products. Government support for pellet mills makes it harder for other members of the American Forest & Paper Association to compete for tree trunks and wood chips, pushing up prices. Those companies, which include chipboard and particleboard manufacturers, say that creates an uneven playing field.

2. U.S. Forest Service data shows 186 million cubic meters of timber was harvested in the Southeast in 2011 — about 60 percent of the U.S. total. In that same year, U.N. data shows Canada, Brazil and China each harvested 140 to 150 million cubic meters.

3. Jenkins et al. (2015) US protected lands mismatch biodiversity priorities. Source

No other country or U.S. region produces more wood and pulp every year than the Southeast

As the wood pellet industry expands across a widening swath of the country, forest owners face few regulatory hurdles in managing their forests and selling to the mills as they see fit. With some exceptions, such as those that shelter endangered species, the forests providing most of the wood pellets being burned

in Europe lack meaningful protections from any local, state or federal agencies. In the U.S., state governments and federal agencies largely view trees as crops.

Most of the forests in the Southeast grow on privately owned land. In the American West, more than two-thirds of forestland is publicly owned, according to U.S. Forest Service researchers, but in the nation's east, 80 percent of forests are owned by families and corporations.

That leaves tremendous swaths of wetlands and forests throughout the Southeast vulnerable to economic trends and to the whims of their owners. Nationally, more than 20 million people own — and control the fate of — an average of 25 acres of forest apiece.

The targeting of hardwoods for wood pellets frustrates groups that have been working to protect and restore the region's native swamps, groves and forests. "We need to be scaling up forest protections," said Danna Smith, executive director of the Dogwood Alliance.

The owners of Southeastern forests prefer to protect their financial interests. "We're always optimistic about new markets," said Dave Tenny, president and CEO of the National Alliance of Forest Owners, a Washington, D.C.-based group representing corporations that own large tracts of forested lands.

Foresters and groups such as Tenny's see increased demand for wood as boons for forest health. Logging provides revenues that can be used to manage land, they say, and property owners are less likely to convert their land to parking lots if a market for wood is strong.

Conservationists and ecologists deride that perspective. "Markets that drive logging create incentives for landowners to manage forests for short-term commercial purposes," Smith said. "Not for long-term ecological sustainability."

SECTION 3.

Mining Brown Gold

Photo by Ted Blanco

Most of the companies making wood pellets in the Southeast are American, ranging from century-old timberland companies to an 11-year old startup. Others are European, including pellet producers from the U.K. and Germany. Of all those companies, none is producing as many pellets as the American startup.

John Keppler was in his early thirties, with a freshly minted MBA from the University of Virginia and a pair of twins on the way, when he and his partners founded Bethesda, Md.-based Enviva in 2004. Their plan was to specialize in burning renewable sources of biomass, such as coconut husks, old fruit baskets and low-value wood, producing heat and electricity in countries rich and poor.

In that same year, Drax Power Station, a coal-fired power plant in northern England as big as a nuclear station, was sold to a newly formed company. The plant had been losing money, and with U.K. policy aiming to phase out coal, the new owners began mixing biomass with its coal supply. Biomass is a catch-all word used to describe wood and other burnable organic material, such as dry grass.

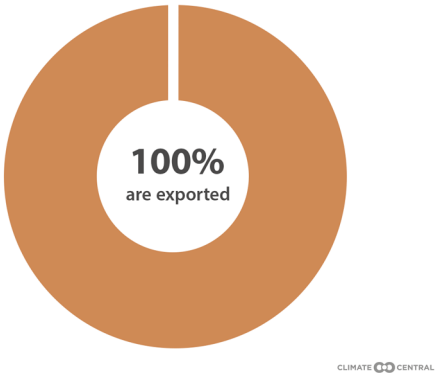
As Drax burned more wood, and as Enviva began specializing in wood pellet production, their businesses became inexorably linked. The success the duo has enjoyed pioneering a new — if environmentally destructive — energy supply chain has been remarkable.

Together, Drax and Enviva have become the public face of an energy industry that's known for tearing down trees on one continent and burning them in another.

Drax now produces half of its nearly 4 gigawatts of electricity, which can collectively meet 8 percent of U.K. electricity demand, by burning biomass — mostly wood pellets. The U.K. now imports more wood pellets than any other country, and Drax is the U.K.'s biggest importer.

Annual U.S. wood pellet exports to Europe more than doubled in the last few years, reaching nearly 4 million tons in 2014. Most of those wood pellets are being shipped to the U.K., and more than three-quarters are being burned by Drax

Where Do U.S. Wood Pellets for Electricity Go?



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Drax officials say they expect to burn more than 6 million tons of wood pellets in 2015. Producing that much wood pellet involves dehydrating about twice that much fresh wood — which is more wood than is cut down every year in all U.K. forests combined.

The three wood-burning boilers at Drax Power Station release more carbon dioxide than the three boilers that still use only only coal (even as they generate roughly the same amount of electricity). Yet that wood energy pollution — which exceeds the pollution of many small countries — will be kept off the company's environmental ledgers.

Drax company officials hope to eventually run the plant entirely on biomass. Enviva is the main wood pellet supplier to Drax, and the main supplier to Europe.

Of the two dozen wood pellet mills operating in the Southeast, according to the Southern Environmental Law Center, six are owned by Enviva. Those mills can churn out more than 5 million tons of product every year. That would involve dehydrating and converting some 10 million tons of so-called green wood into pellets. Total production capacity could more than double after planned new mills begin operating.

Drax gets pellets from about 13 of those mills in the U.S., including two they own, and from eight in Canada and 21 in Europe. It doesn't want to depend on a handful of suppliers for the fuel of its future. "Once you convert these power plants, these pellets have got to show up," Drax Biomass chief executive Pete Madden said. So the power plant company founded its own wood pellet business, which opened offices on the 31st floor of a modern Atlanta office building this year. "We're also trying to drive down the cost."

Drax began operating its own port this year in Baton Rouge, La. It also built pellet mills in Louisiana and Mississippi, which began operating around the clock this year. Each has a similar capacity to Enviva's mill near Franklin, Va., and they could produce nearly a million tons of pellets combined next year.

Still, those two hulking mills are expected to meet less than 15 percent of the power plant's annual pellet needs. That suggests that at least a dozen mills of the same size are needed to meet the demand for wood from England's biggest power plant — one that's still half powered by coal.

Drax is the world's biggest burner of wood pellets, but it isn't the only one. The pellets are also being burned in power plants in Denmark, France, Belgium, Germany and the Netherlands. Conversions from coal to wood are also underway at power plants in Asia.

Trucks deliver logs and wood chips to Enviva's mill in Southampton County, Va., where they are heated, crushed and turned into wood pellets to be exported to Europe. Photos by Ted Blanco.

This spring, with Keppler's twins not yet teenagers, Enviva listed on the New York Stock Exchange. More than 500 employees are expected to produce more than 2 million tons of wood pellets in 2015 — all made in the U.S., and all bound for Europe. The stock market values the company at nearly $300 million.

Both Enviva and Drax rely on European climate subsidies for their profits. Without that financial support, wood energy couldn't compete on price with fossil fuels or cleaner alternatives.

Fat with government support, the industry is eying potential new markets and new forests.

Korean and Japanese power plants have started burning wood pellets to meet climate targets set by their governments. Pellet industry leaders hope China will follow. Keppler says Enviva may start exporting pellets to Asia from the West Coast, made by using wood from the Pacific Northwest's timber and paper industry. "We continue to look for attractive growth opportunities," Keppler said.

SECTION 4.

Fearing An Encroaching Threat

Photo by Ted Blanco

Dean Wilson maneuvered his aluminum boat through the shade of a cypress swamp, back toward a sunny thicket of invasive vines. Around him, the nation's largest river swamp pulsed with fish-hunting spiders, alligators and mosquito-eating dragonflies. Wilson nudged a wayward tree frog off his forearm, into the weedy thicket.

Wilson has spent much of his life on the Atchafalaya Basin, a short drive west from Baton Rouge, La. — the city where Drax opened its pellet port this year. He used to fish these waters for a living. Now he protects them as the Atchafalaya basinkeeper, a full-time job with a small conservation nonprofit. He occasionally gives swamp tours. Wilson's Spanish accent is a legacy of his European childhood. He moved to Louisiana when he was 22. Now a sun-baked 53-year old, he can steer a boat between low branches in these Louisiana backwaters like a ferret through a warren.

A decade ago, Wilson and other locals fought to stop loggers removing cypress trees from the basin to produce garden mulch. The groups prevailed after WalMart, Lowes and other big box retailers agreed to stop selling the mulch, and after some of the logging was halted in 2008 amid claims the logging roads needed water quality permits. This year, state and federal agencies ruled that no permits were required, clearing the way for logging to resume.

Far from Wilson's swamp, an international fight is underway against the use of wood pellets for energy, with environmental groups and scientists warning European leaders of grave consequences for the climate. The fight isn't just about protecting the climate, though. With the wood pellet industry inching closer to the Atchafalaya Basin, environmentalists are fighting there — and in other forests throughout the Southeast — to protect ecosystems with immeasurable natural value.

"We look at what they're doing on the East Coast — they're logging these trees to make wood pellets," Wilson said. "We're very much aware of the threat."

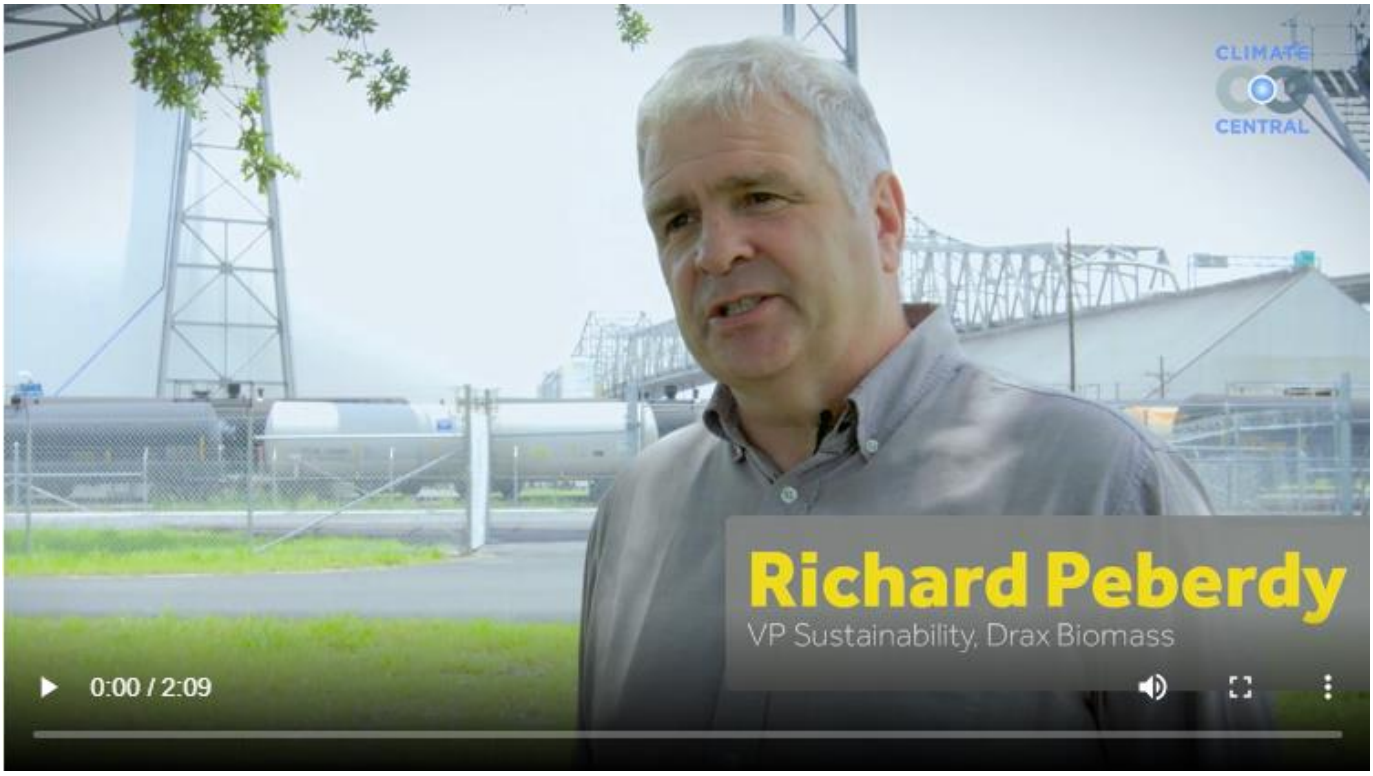
Wilson has read the flyers that Dogwood Alliance produced documenting Enviva's use of cypress wetlands for pellets, and he has agonized over their tales. He helped organize a group of Louisiana activists into the Save Our Native Forests Coalition, which works to protect the cypress trees that dominate Louisiana's remaining coastal wetlands from pellet mills.

Not only did Drax open a pellet port near the Atchafalaya Basin this year, it began operating pellet mills in Morehouse Parish, La., and just over the Louisiana border in Mississippi. The nation's largest pellet mill is being built by a German company in the small town of Urania, La. It will use about 2 million tons of wood every year to produce more than 1 million tons of wood pellets, with many of them destined for Drax's boilers.

After the Civil War, the Atchafalaya Basin was extensively logged for its valuable cypress lumber. The forest has been slowly regrowing since. Wilson calls the trees that fill the basin "hundred-year old babies." Because the trees take such a long time to grow, Wilson says it would take "hundreds and hundreds of years for this forest to mature again" — if it could at all.

With the annual arrival of a wet season, snails, spiders, lizards, snakes, minks and raccoons move into trunks and canopies of cypress forests to escape the seasonal waterway that forms beneath. When the grounds dry, the cypress trees cast their seeds on fertile soil. Now, a network of levees keeps great patches of the basin flooded year-'round, preventing cypresses from regrowing after they're cut down. That's why the weed thicket upon which Wilson deposited the frog was so sunny — stumps of cypress trees could be seen, but none had regrown.

Wilson and his coalition have held meetings with Drax, aiming to prevent prized forests from being processed for wood pellets and incinerated. "I'm trying to explain to them that it's in the best interest for the industry to leave these forests alone," he said. "It would be used by us to attack the industry in Europe."



Cypresses and other hardwoods taken from Southeastern swamps and wetlands are already being used to produce pellets used as fuel by Drax. "It's only a very small proportion of our feedstock," Drax Biomass sustainability vice president Richard Peberdy said.

Wilson says Drax seems to be listening, and it told the group it has no plans to use cypress trees from the Atchafalaya Basin in either its Mississippi or Louisiana pellet mills, which use pine and not hardwoods, or in its power plant. But the company hasn't put the assurance in writing, nor can it speak for other pellet producers or power plant owners.

If loggers begin harvesting Atchafalaya cypresses for pellets, it would be "controversial," said Louisiana State University's Vlosky. But controversies have done little to protect similar wetland forests from pellet producers in Virginia or North Carolina.

"People who have private land down there — they could cut cypress trees," he said. "There's absolutely nothing to stop that from happening."

Source: https://reports.climatecentral.org/pulp-fiction/2/