

Greenwashing

A Report on the Corporate Selling of Polluting Wood Pellet Production



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Introduction

“I have had many precious moments in these woods, and this past fall as I walked there the feeling became overwhelming that something must be done.” – Rachel Carson

Greenwashing: A Report on the Corporate Selling of Polluting Wood Pellet Production is the Rachel Carson Council’s (RCC) third comprehensive report exposing the wood pellet industry, following *Clear Cut* and *Bad Business* which respectively explore the “forces driving the wood pellet industry’s hold in the United States” and the “money behind the wood pellet industry.”¹ Each report in the series discusses the environmental damage caused by wood pellet production in the United States (U.S.), but *Greenwashing* offers a new perspective, shedding light on the deceptive claims made by and misinformation surrounding the industry. It makes a compelling case for the U.S. to abandon the practice of burning wood pellets for fuel. These reports stem from RCC’s mission to continue the environmental vision and legacy of Rachel Carson in contemporary times. Carson’s groundbreaking exposé, *Silent Spring*—about the destructive impact of the insecticide DDT on animals, humans, and ecosystems—played a major role in laying the groundwork for the modern environmental movement.^{2,3}

Less known is Rachel Carson’s deep attachment to woodlands, especially around her home in Southport, Maine, where she worked to prevent their development and clear-cutting while founding the Maine chapter of The Nature Conservancy. As Carson wrote at the time, after describing the surrounding scents and scenery, “I have had many precious moments in these woods, and this past fall as I walked there the feeling became overwhelming that something must be done.”

Something must be done, indeed. This report is designed to investigate, educate, and promote action. It compiles the main research from prominent environmental groups, universities, and research institutions about the consequences of exploiting woody biomass for energy, including its effects on local communities and the environment. Organizations which have been integral to the production of this unique RCC examination of corporate misinformation include the Dogwood Alliance, the Natural Resources Defense Council (NRDC), the Southern Environmental Law Center (SELC), Blue Orca Capital, and many others.



Rachel Carson on the deck of her summer home, West Southport, ME, 1961. Photo credit: Robert Hines.

RCC's *Clear Cut* analyzes the science behind wood pellet biomass, revealing that U.S. pellet manufacturing not only uses the leftovers of the lumber industry, but also clear cuts whole, immature, and mature trees in forests across the Southeastern U.S. These clear cuts result in an immense loss of carbon sinkage, or absorption of carbon dioxide from the atmosphere, an essential and naturally occurring bulwark against climate change. Similarly, RCC's *Bad Business* examines the economics of the industry and how investments in it are not financially viable over the long-term. By penetrating the fog of corporate misinformation, building on the findings of previous RCC woody biomass reports and the legacy of Rachel Carson, *Greenwashing* conclusively determines that a clean energy future cannot continue to burn wood for energy.

What is Woody Biomass?

Biomass energy is defined as any organic material coming from plants or animals used as energy. Wood pellet biomass (or woody biomass) refers to wood from whole trees and compressed forest residue that after many stages of development are combusted for fuel.⁴ Burning wood for energy is not a new practice, recently having been used predominately for cooking and heating households in developing countries. Corporations claim that only residue or ground cover plants that are left in forests after wood harvests are harvested to produce these pellets. But, as many independent investigations and this report reveal, mature hardwood trees are also clear cut and used. Because of hefty economic subsidies and legal frameworks that encourage woody biomass production and a robust effort by the industry to brand itself as sustainable, its use has surged in wealthy countries as an appealing, money-saving switch from non-renewable energy sources like coal and other fossil fuels. In fact, the majority of modern wood pellet burning facilities are former coal or fossil fuel plants.^{5,6}

Woody biomass: A form of energy that comes from burning wood pellets. These wood pellets are produced from clear cut tree logs and compressed "residue," or plant and wood waste, from forests. Also called wood pellet biomass.

History of Greenwashing

In the 21st century, consumer demand has caused a growth in eco-friendly and sustainable products.⁷ Eco-friendly label programs have increased drastically in the past 30 years, from 12 in 1990 to 463 programs as of 2018.^{8,9} Yet, despite advertising, many products are not as "green" as they seem. Corporations place a heavy burden on consumers, feeding them incomplete or inaccurate information, leaving them to fact-check bold environmental claims.

Greenwashing: A strategy used to advertise/present a certain action as environmentally beneficial or sustainable, when the strategy is, in reality, economically motivated or environmentally damaging.

The term "greenwashing" was first coined by ecologist Jay Westerveld in a research paper he published in 1986.¹⁰ Westerveld used it to describe a hotel's policy to reuse towels in the name of environmental protection, when it was actually a change the hotel made to save money while it planned an expansion.¹¹ The term has grown to describe a tactic companies employ to falsely market their products as eco-conscious. Popular greenwashing strategies include vague, unsubstantiated

claims of pro-environmental impacts, like carbon neutrality, referring to net-zero carbon dioxide emissions through offsets that counteract the emissions, or imagery of nature and inclusion of the color green in packaging to make the company appear environmentally friendly.¹² With demand for sustainable products on the rise, well-intentioned consumers must closely examine companies' claims of sustainability and be wary of greenwashing.

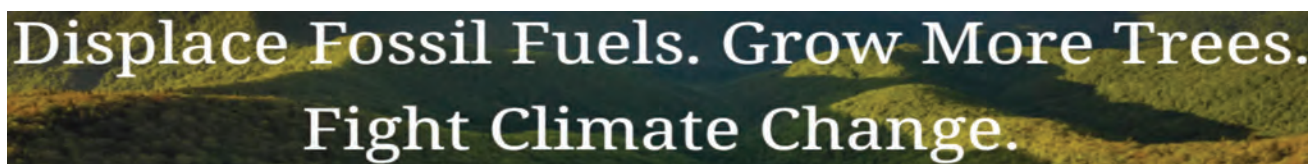
Some of the worst greenwashing offenders are the major players in the fossil fuel industry whose entire modus operandi has been to deceive the public about the pernicious impact of their product, energy

Decarbonizing: An effort to reduce some or all carbon dioxide emissions.

sources derived from fossils, on the climate. A study from Texas A&M University analyzed 12 years of keywords in annual reports, actions taken to decarbonize, divestments from fossil fuels, and investments in clean energy from BP, Chevron, ExxonMobil, and Shell. In the years following their commitment to decarbonization, words like "climate," "low-carbon," and "transition" grew exponentially.¹³ However, GHG emissions reduction pledges, like those from Shell in 2017 and BP in 2019, have rarely materialized.¹⁴ Companies retained economic "dependence on fossil fuels," with few investments in clean energy. Chevron's "People Do" campaign shows that even when companies support environmental efforts, the campaigns are often economically motivated.¹⁵ After illegally dumping thousands of pounds of pollutants into lands surrounding the Santa Monica Bay and racking up \$1.5 million in penalties, Chevron's People Do campaign built a preserve on that same plot of land.¹⁶ Despite this, the preserve cost the \$290 billion corporation a mere \$5,000 annually, while advertising that the preserve "cost millions of dollars to produce and broadcast."¹⁷ Throughout the duration of the campaign, Chevron was found violating the Clean Water Act and spilling oil onto wildlife refuges.^{18,19}

Wood pellet industry actors mirror fossil fuel companies' greenwashing, presenting themselves as a sustainable alternative to coal and fossil fuels. Focusing on Enviva and Drax, two of the world's largest wood pellet-based energy distributors, and addressing the role of international governments, this report discusses how companies and governments alike advertise wood pellets as a source of clean, renewable energy, when the environmental and economic consequences of wood pellets prove otherwise.^{20,21} Enviva, Drax, and other greenwashing wood pellet manufacturers demonstrate how corporations touting solutions to climate crisis can be some of the most complicit in its acceleration.

The Story of Woody Biomass



Displace Fossil Fuels. Grow More Trees.
Fight Climate Change.

"Grow more trees" and "fight climate change" reads the large text on Enviva's homepage, atop a background photo of green, tree-covered mountains.²² Enviva, like other biomass firms, advertises "sustainable wood pellets" as a renewable alternative to coal, claiming that wood pellets reduce fossil fuel use and carbon emissions, all while protecting forests. Drax promotes the same narrative, claiming biomass decarbonizes industries like fossil fuel and transportation sectors.²³ Both corporations claim wood used for pellet manufacturing "comes from sustainably managed forests."

Though biomass is classified by governments, including the United States, as renewable, it is not a clean energy source. The harvesting and burning of organic matter, including trees, releases carbon dioxide — the single-most abundant anthropogenic greenhouse gas — back into the atmosphere.^{24,25} Through careful wording on their websites, sustainability reports praising their work, donations to environmental protection funds, and other public relations techniques, Enviva and Drax try to convince consumers and governments that they are the energy source of a carbon-free future.

According to the U.S. Energy Information Administration (USEIA), use of woody biomass has increased to reduce “carbon dioxide emissions from fossil fuel use.”²⁶ However, this statement ignores the role of wood pellets in the carbon cycle; it is just one example of how governments fortify claims made by the industry. Ignoring concerns from over 170 nongovernmental and environmental organizations and 800 scientists, the United Nations (UN) corroborates the U.S.’s classification of woody biomass as “renewable.”^{27,28}

Beyond endorsing biomass as renewable, the U.S. actively funds and subsidizes woody biomass through an extensive list of federal programs. Potential renewable energy subsidies through the U.S. government exceed \$100 billion dollars while the U.S. Department of Agriculture (USDA) provides hundreds of millions of dollars in funding for biomass projects annually.²⁹ Through governmental support and the power of greenwashing, biomass is continually rising as a popular energy source, with an expected compound annual growth rate of 5.73% between 2023 and 2032.³⁰

Wood pellet companies claim:

- Material used for wood pellets comes from “sustainably managed forests,” and only woody waste is used to source pellets.
- Woody biomass reduces carbon dioxide emissions and costs compared to fossil fuels and coal.
- The industry increases forest cover, thereby mitigating climate change.
- Local communities benefit from the industry and their pellet plants.

Major Players in Woody Biomass

Enviva: “Supporting Local Communities” While Risking Forests and Human Health

Enviva is the world’s largest producer of wood pellet biomass, exporting worldwide while exclusively harvesting and producing pellets in the Southeastern U.S. The firm’s largest plants are in North Carolina, Georgia, and Virginia, with pellets shipped out of ports in Virginia, Alabama, Florida, Mississippi, Georgia, and North Carolina.³¹ Until 2022, Enviva exclusively shipped internationally, but in January of 2022, the company landed its first U.S. customer and plans to increase its production capacity by rapidly expanding the number of plants in the U.S.³² This will require building two new plants in Georgia, Mississippi, North Carolina, and Virginia every year.³³ As of 2022, Enviva produces nearly 6.2 million metric tons of wood pellets annually, but its expansions will give rise to a projected 13 million metric tons by 2027.³⁴

The company continues to grow rapidly, despite coming under fire for greenwashing last year. Touting itself as a leader in the renewable energy world, Enviva’s mission statement is to “Displace Fossil Fuels. Grow More Trees. Fight Climate Change.”³⁵ However, after years of maintaining the facade

that the company was not contributing to fossil fuel emissions, several environmental mishaps were brought to light in 2021, including six fires across several years at its wood pellet plants. The fires led to air quality violations and fines that culminated in a demand from the North Carolina Department of Environmental Quality (NCDEQ) to install filters for carcinogen pollutants, unveiling the fact that Enviva's emissions were contaminating local communities' air.³⁶ Later that same year, in March 2022, a report commissioned by the Southern Environmental Law Center (SELC) on a satellite image analysis by Clark University revealed that as pellet plant operations in North Carolina and Virginia began, hardwood forest harvesting nearby increased rapidly.³⁷ The researchers created a map of forest harvesting using satellite data of Enviva's pellet mills. Additionally, the researchers visited the sites to collect photographic data that confirmed the map's analysis. Ultimately, they found a net loss in forest cover, with little regrowth despite Enviva's claims of increasing forest cover in areas of operation.^{38, 39}

Enviva's response to potential backlash for greenwashing was to present an environmentally conscious narrative, launch multiple philanthropic programs, such as the Enviva Forest Conservation Fund, and initiate community outreach, all of which are promoted on the company's blog. The Enviva Forest Conservation Fund is a \$5 million program that the U.S. Endowment for Forestry and Communities implements across Virginia and North Carolina.⁴⁰ The fund matches grants by non-

profits for enhancing ecosystems and promises to protect sensitive ecosystems by improving "forestry practice for working bottomland forests." Enviva's blog also highlights community outreach programs, with headlines including positive, recycled language in the titles such as "Enviva Welcomes...," "Enviva Celebrates...," or "Enviva Thanks..." One blog post shares how Enviva's port in Chesapeake, Virginia, received a "Sustained Distinguished Performance



Photo: Dogwood Alliance, Enviva Harvest Site, May 2015

River Star Business" recognition by the non-profit Elizabeth River Project, for its "energy saving efforts, metal recycling, and increased oyster gardening projects."⁴¹ The port ships wood pellets produced at the Ahoskie, Northampton, and Southampton Enviva plants to Europe.⁴²

Enviva's environmental degradation was revealed again in October 2022, when Blue Orca Capital, an activist investment firm, published a report uncovering the company's falsified sustainability claims, exposing increased deforestation and ecosystem destruction, but also predicting the firm would not be able to pay its promised shareholder dividends.⁴³ The Blue Orca report opened the door for a legal complaint filed by Enviva shareholders against the wood pellet firm in November, which accused the company of false marketing and misleading sustainability statements.⁴⁴ The complaint cites Enviva's false statements that its wood pellets come from wood waste "such as ... tree tops and limbs, understory, brush, and slash," instead noting that Enviva's wood pellets come from clear cuts.⁴⁵

For Enviva, scandals continued in December of 2022, when a whistleblower who formerly worked in management provided damning information to Mongabay, an environmental news platform.⁴⁶

The whistleblower confirmed Clark University's report finding that Enviva uses entire trees for its production rather than only the woody byproducts. It also noted that Enviva contracts with loggers rather than employing them directly to escape blame for tree harvesting practices that do not live up to Enviva's claims of sustainable harvesting. The article also alleged that forest clear cuts were turned into development sites instead of regrowth sites after harvest, contrary to the company's assurances.

Drax: Investing in Local Conservation Programs to Excuse Air and Forest Degradation

Drax was founded in 2012, when the U.K. based coal energy provider Drax Group transitioned to wood pellet production.⁴⁷ Today, Drax is a global biomass superpower. The largest Drax plants in the U.S. are located in Alabama and Louisiana, with ports in both states. The firm plans to double production to eight million metric tons by 2027.⁴⁸

An article by an investigative journalist published in the *New Yorker's* December 2021 issue described an informational tour at Drax's facility in Drax, England.⁴⁹ The journalist, Sarah Miller, traveled there in 2019 to visit the plant, which offers public tours. On the Drax website, it is noted that those who attend the informational tours may also visit the Skylark Centre and Nature Reserve, a natural preserve maintained by Drax and frequented by outdoor education classes in local schools, an example of one of the biomass company's conservation efforts.⁵⁰ Miller notes that Drax's tour guide stated that its wood pellets are derived from woody byproducts, not whole trees. Though after the tour, Miller was presented with aerial photos of clear cut forests licensed to Drax by the Canadian government from Conservation North, a community group from British Columbia affected by Drax's forest clearings.



To maintain its reputation, Drax leads engagement endeavors to strengthen relationships with communities that neighbor their plants in the U.K., the U.S., and Canada and claims it contributes to the local economies.⁵¹ The firm has three main philanthropic outlets: the Drax Foundation, the Drax Community Fund, and the Drax Communities in Crisis Fund. The Drax Foundation provides grants for educational and green space enhancing purposes between £10,000 and £50,000. The Drax Community Fund provides small grants to local projects up to £2,000 in areas near Drax plants. The Drax Communities in Crisis Fund provides humanitarian relief and support for natural disasters and conflict. The company additionally estimates that its contribution to GDP throughout the U.K., U.S., and Canada in 2021 was £3.1 billion.⁵²

Despite Drax's contributions to communities and commitments to sustainability and conservation, the firm's environmental impact on the local level has been decidedly disruptive. In February 2021, the firm was fined \$2.5 million for breaking Mississippi's air quality standards for Volatile Organic Compound (VOC) emissions.⁵³ Then again, in September 2022, Drax was forced to pay \$3.2 million for breaking Louisiana's air quality regulations in two separate settlements, amounting to the highest fine paid to the Louisiana Department of Environmental Quality since 2012.⁵⁴

Not long after the news broke about Drax's U.S. fines, a CBC News investigative article published in October 2022 showed Drax had been primarily logging in "old growth and primary forests" in British Columbia, Canada.⁵⁵ The article also exposed numerous Canadian politicians who were aware of the environmental degradation and remained silent, including Premier John Horgan and his administration. The journalists analyzed Drax's fine print, which admits to logging in old growth forests, despite the company's adamant facade of "environmental conservation and protection."^{56,57} Further evidence has shown that while the company presents itself as a leader in clean energy, Drax's U.S. mills produce atmospheric carbon that will remain in the Earth's atmosphere beyond the year 2059.⁵⁸ Following the series of scandals, Drax was removed from the S&P Global Clean Energy Index, an index of the "world's greenest energy companies."⁵⁹



Biomass on the Rise

Between 2012 to 2021, the U.S. produced about 66.9 million metric tons and exported 51 million metric tons of woody biomass.⁶⁰ Exports have increased nearly four times since 2012, and the growing demand has paved the way for the construction of new plants and expansion of current plants, many of which were former coal plants that transitioned to biomass energy.^{61,62} With more plants producing biomass energy, the U.S. sector of wood pellet energy generation is expected to skyrocket, jumping from 53 billion kWh in 2022 to a projected 218 billion kWh in 2030, which is enough to power 80 million homes for one year.^{63,64,65}

Though the U.K., EU, and U.S. all pledged to oppose forest loss and land degradation, [their] investments in biomass come at the cost of investing in clean and renewable sources, such as solar energy, wind energy, and hydropower.

Both Enviva and Drax harvest most of their wood in the U.S. and compress the yield into pellets to sell to international consumers, such as the U.K. and the EU, who purchase wood pellets as an alternative to coal as a strategy to decarbonize. The U.K. is the primary consumer of U.S. biomass exports, and claims that the biomass "offsets high generation costs" of other forms of energy.^{66,67}

However, the U.K. subsidizes billions of taxpayer dollars for wood pellet biomass, primarily to Drax, and spent £2.1 billion on them in 2020 alone.⁶⁸ The U.K. Department for Business, Energy, and Industrial Strategy labeled biomass as renewable and low-carbon emitting, while conceding that its use "requires an understanding of the life-cycle [greenhouse gas] emissions, biodiversity, ecosystem

services, and social issues.” In that same public statement, the Department admitted that biomass “sustainability criteria do[es] not cover air pollutant emissions as these are primarily associated with the use of biomass in heat and energy generation rather than with production.”⁶⁹ Despite this problematic evaluation, in 2021, the U.K. approved £26 million for domestic biomass production to “slash carbon emissions.”⁷⁰

The EU is the U.S.’s second greatest consumer of wood pellets, purchasing over 23 million metric tons on pellets in 2021.^{71,72} The transition to wood pellets is part of the EU’s efforts to meet its target of 32% renewable energy sourcing by 2030.⁷³ Under the first Renewable Energy Directive (RED), woody biomass was classified as a renewable energy source, which authorized billions of dollars in subsidies for pellets produced in the U.S.^{74,75} Controversy around wood pellet biomass inspired the drafting of Article 29 of the EU’s Renewable Energy Directive II (REDII), which requires wood pellet producers to meet stricter sustainability standards at the sourcing level to account for the entire supply chain in an effort to prevent deforestation.⁷⁶ The EU has failed to set a date to vote on the EU REDII Amendment, in a move which some believe is intentional, as it would reduce biomass consumption by redirecting the Union to clean, renewable energy sources, solar and wind power, which are demonstrably less expensive and use subsidies more efficiently.^{77,78}

Continued international investments in biomass are a direct result of the 2022 United Nations Framework Convention on Climate Change (COP27; UNFCCC), which also classified biomass as “renewable energy.”⁷⁹ Biomass was bookmarked as sustainable because “the level of carbon stocks on these land areas does not systematically decrease over time;” yet the same assessment notes that “carbon stocks may... decrease due to harvesting.”⁸⁰ The UNFCCC failed to include a time frame for these forest carbon stocks to rebound, which leaves the standard for sustainability unclear. Governments around the world benefit from “a carbon accounting loophole” wherein the UN Intergovernmental Panel on Climate Change (IPCC) guidelines recognize wood pellets as a carbon neutral energy source.⁸¹ Though the U.K., EU, and U.S. all pledged to oppose forest loss and land degradation at COP27, they continue to approve grants and subsidies to biomass companies.⁸² These investments in biomass come at the cost of investing in clean and renewable sources, such as solar energy, wind energy, and hydropower, all of which offset carbon emissions on a short time scale.⁸³

Fortunately, the Netherlands and Australia have begun to push back against the false narrative of sustainable woody biomass. After the Enviva whistleblower article was published, the Netherlands stopped paying subsidies to wood pellet manufacturers that provide misleading information about how they source their wood, including Enviva, due to its practice of clear cutting entire forests.⁸⁴ The Netherlands explained that current standards for pellet manufacturers, such as the EU’s Sustainable Biomass Program (SBP) standards, do not hold biomass companies responsible for unsustainable sourcing methods.⁸⁵ Australia followed suit, changing its renewable energy policy to remove woody biomass from the list of renewable energy sources.⁸⁶

By comparison, the U.S. incentivizes the wood pellet industry as international investments in biomass continue to drive production. Various departments and legislation continue to provide tax breaks for wood pellets and label pellets as sustainable, including the U.S. Department of Energy (DOE) and the USDA. Annually, the DOE and the USDA spend about \$13 billion in tax breaks and program implementation on woody biomass.⁸⁷ Through the U.S. Treasury, woody biomass is eligible for two other programs that provide tax breaks — Sec. 45 Credit for Electricity Produced from Certain Renewable Resources and Sec. 48 Energy Investment Tax Credit.⁸⁸ Enviva itself has received millions

in tax breaks.⁸⁹ Additionally, Congress' Build Back Better Act of 2022 includes a \$50 million grant for old-growth forest protection, but classifies biomass as sustainable and approves grants for biomass forest management practices.⁹⁰

Enviva has thrived because of U.S. incentives and has received billions of dollars from the government to remain in operation in the form of federal, statutory, and local grants and subsidies. For example, since 2011, the Enviva plant in Northampton County alone has received nearly \$3 million from various governmental and nonprofit organizations, namely the Economic Development Administration, the Northampton County budget, the North Carolina Department of Commerce Industrial Development Fund, and the North Carolina Department of Commerce One Carolina Fund.⁹¹ The state of North Carolina has financially supported Enviva with over \$6 million in subsidies to establish facilities. Federal woody biomass funding from the Biomass Crop Assistance Program (BCAP) cost taxpayers \$243 million throughout 2009 and 2010.⁹² Drax benefitted from \$1.15 million in governmental subsidies in 2021 and 2022.⁹³

Beyond subsidies and tax breaks, plants receive multi-million-dollar bailouts. Other companies and the government have had to bail out Enviva, Drax, and other pellet plants that have exceeded initial budgets. Eversource, a New Hampshire utility company, purchased woody biomass energy for its consumers; estimates show that consumers paid \$100 million more than market rates in just eight years, as of 2020, compensating for the plant's inefficiency.^{94,95} Across the state, four plants closed as they could not compete with market electricity prices. A representative of one of the few remaining active plants testified in front of New Hampshire's legislature in fall of 2022, asking for the state to use taxpayer money to cover above-market prices with no cap or limit, or else the plant would close; the state legislature then passed a bill, approving the proposal.⁹⁶ Similarly, Maine allocated \$13.4 million of tax revenue to cover above-market electricity prices from four troubled woody biomass plants in 2016, in an effort to recover its collapsing wood pellet biomass industry.^{97,98,99}

Though biomass provides poor returns on investments, company executives continue to cash in. Enviva's CEO, Thomas Meth, has an annual salary of \$1.85 million^{100,101,102} and the company's revenue continues rising, reaching \$1.1 billion in 2022.¹⁰³ Drax's CEO, Will Gardiner, has an annual salary of \$5 million. Companies and executives profit even amidst numerous greenwashing scandals.¹⁰⁴

The Environmental Reality of "Sustainably Managed Forests"

Forests are one of the world's most effective tools in fighting climate change because of their ability to sequester carbon. During photosynthesis, trees remove carbon dioxide from the atmosphere to produce glucose, which is used as a source of energy for the tree's growth. The carbon dioxide is used to build the tree's roots, trunks, and branches, and larger amounts are stored as carbohydrates, another product of photosynthesis.¹⁰⁵ According to Robert Keen, forester and CEO of Forests Ontario, an 80-year-old tree can sequester 200 kg (440 lbs.) of carbon in its lifetime and will deposit that



carbon into the soil of a developed forest if it dies naturally.¹⁰⁶

Wood pellets are often manufactured from forest residue or waste products, like sawdust and shavings, left by other lumber industries, as well as from whole trees that have been clear cut. Wood pellet companies claim that managing forests through removal of forest debris provides environmental benefits, like increased protection against wildfires, but several studies



suggest otherwise.^{107,108} While forest residue can be a source of fuel for wildfires, several other factors like humidity, temperature, vegetation and fuel moisture, and wind all influence the development and behavior of wildfires.^{109,110} Forest thinning, including selective logging and forest waste removal practices, can actually exacerbate wildfire intensity, by changing the structure of forests to increase fire-prone formations that are vulnerable to severe fires, like large, similar-sized and even-aged tree plots.¹¹¹ A study published in *Ecosphere* analyzing 1,500 wildfires between 1984 and 2014 in western U.S. forests found that state- and federally-protected forests generally experienced less severe fires than highly managed forests despite having greater fuel levels.¹¹² Likewise, thinned forest plots in California experienced greater fire severity, as measured by tree mortality, than unthinned plots during a 2021 wildfire.¹¹³ Because forest thinning in the long term reduces trees' capacity to absorb carbon dioxide and reduce greenhouse gas emissions, this practice can exacerbate climate change impacts like wildfires.¹¹⁴

Carbon sequestration: The process in which atmospheric carbon dioxide is removed and stored in other ways, often in soil, plants, or trees.

Apart from inconclusive research concerning the efficacy of harvesting forest residue for wildfire prevention, removing this residue can disrupt ecological processes. Forest residue plays an important role in nutrient cycling in forest ecosystems. Removal of forest litter can reduce soil organic matter and nitrogen, and limit tree growth.¹¹⁵ Unlike prescribed forest burns which nourish the soil, biomass companies remove understory materials and dead and felled trees, which are important components of nutrient cycling in forest ecosystems and provide habitat for organisms like woodpeckers, bats, squirrels, and fungi.^{116,117,118,119,120} Additionally, the impact of debris removal may last decades as dead tree ecosystems take many years to form after harvest.¹²¹ Therefore, overly intensive thinning procedures, including clear cutting, can severely degrade ecosystems.¹²²

The European Academies Science Advisory Council conducted a deep analysis of wood pellet production and found that the "only scenario" that did not emit high amounts of carbon dioxide and impact biodiversity would be to burn small tree twigs, but even then, significant material should be left unharvested to maintain soil carbon and fertility.¹²³

“Enviva wants everything now... and has added to the possibility of selling every stick, trunk, etc. [With Enviva’s demand], it’s cheaper to clearcut.”

Interview with Charles Robbins, Cape Fear River Adventures.

Wood pellet companies claim their biomass is exclusively harvested from forest residue or byproducts from the logging industry, but that is untrue. Enviva, for example, uses up to 90% of some forest harvests, which includes trunks, in production.¹²⁴ Enviva and Drax cut down healthy trees to support the demand for wood pellets, which has outgrown the supply of woody residue in forests.^{125,126}

The Rachel Carson Council’s previous report on wood pellet usage, *Clear Cut*, found that Enviva alone clear cuts 50 acres of forest each day.¹²⁷ Additionally, in North Carolina, at least 164 acres of forest are lost each day to the biomass industry.¹²⁸ This number will only grow. The Energy Information Administration (EIA)

of the DOE predicts that biomass energy could provide up to 15% of the country’s energy by 2035, which would require each pellet plant to harvest an average of 6,000 acres of forest.¹²⁹

Clear cuts: A logging practice that many companies use, in which entire trees are cut at the same level. Oftentimes, these ecosystems are left devastated, as this practice does not take measures to avoid habitat, animals, or soil destruction.

Carbon sink: An environment that can absorb more atmospheric carbon dioxide than it emits, contributing to net-negative carbon dioxide emissions. Examples include: forests, oceans, and coastal habitats.

Species Under Pressure in Bottomland Hardwoods

Swainson’s warbler

Migrates through bottomland hardwood canopies

U.S. Fish and Wildlife Service
Northeast Region



Saint Francis’ Satyr butterfly

Endangered

Wikimedia



Mountain Sweet Pitcher Plant

Endangered

U.S. Fish and Wildlife Service
Southeast Region



Black bear

Found in hardwoods of North Carolina mountains and coast

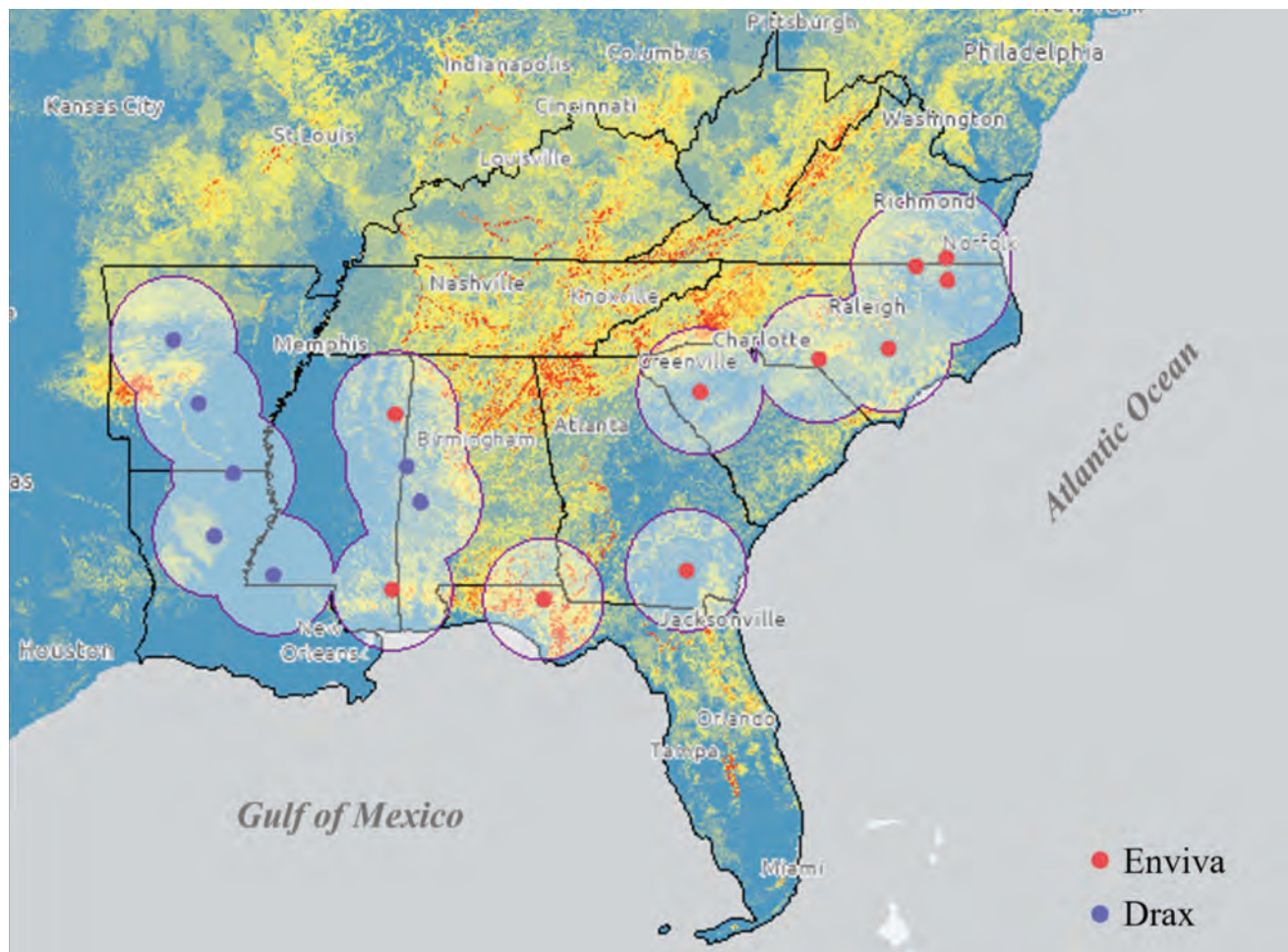
Creative Commons



A number of beautiful and necessary species depend on North Carolina’s bottomland hardwood forests. Many are already under significant pressure from the instability and destruction of their traditional ecosystems. Turning these forests into industrial sites will deny these species access to the complex forests they depend on, even if individual trees grow back.

Research has consistently found that wood pellet plants target forested lands of high biodiversity and high productivity, which provide vital ecosystem services. A 2013 study commissioned by the National Wildlife Federation and SELC that reviewed locations of all U.S. woody biomass plants found that every single major plant was located in a “high impact” location for biodiversity that provides “important ecosystem services.”¹³⁰ The U.S. Department of the Interior reported that about 40% of critically endangered ecosystem types were found in regions now populated with wood pellet plants.¹³¹ The Southeastern U.S. boasts some of the highest concentrations of biodiverse ecosystems in the nation, including wetland forests, coastal plains, and mature forests, many of which are target areas for pellet harvesting.^{132,133,134,135} The region provides habitat for over 150 mammal species, 170 amphibian species, and 500 bird species, many of which are vulnerable to species decline.^{136,137} According to the EPA, about 60% of the forest areas that were once in the coastal plains of the Southeast are degraded, threatening the vast number of species dependent on those forests.¹³⁸

The map below of the Southeastern U.S. shows concentrations of endangered species and species at risk of extinction, with red zones indicating high species richness and blue zones indicating fewer species, along with their proximity to sourcing areas for Drax and Enviva pellet plants, represented by blue and red dots, respectively. The buffers surrounding the dots represent a potential sourcing radius of up to 75 miles.^{139,140} The map demonstrates that high biodiversity regions are at risk of degradation driven by the wood pellet industry, particularly the Apalachicola National Forest on the Gulf Coast of Florida and the Ouachita National Forest in Arkansas.



Clear Cuts

Not only does the wood pellet industry target and harvest wood from areas of high biodiversity, but clear cuts release enormous amounts of carbon dioxide into the atmosphere. Biomass companies are contributing to increasing carbon dioxide emissions despite their pro-environmental messaging. Clear cuts interrupt the natural carbon cycle and decomposition process, depleting carbon storage both in forest wood and soil, damaging a forest's capacity to sequester carbon.¹⁴¹

Rebutting Replants

Wood pellet producers will stamp their corporations as carbon-neutral by attempting to compensate for clear cut forests with newly-planted tree farms. The former forest cover is converted into a monoculture plantation, acres of land exclusively used to grow single-species tree farms. Monoculture tree plantations serve as carbon credits, inexpensive credit purchased from a third party that "offsets" the amount of carbon pellet manufacturers emit in production, theoretically.¹⁴² Enviva has two such partnerships with GreenTrees and Finite Carbon who hire small forest landowners to plant trees on their property.¹⁴³ Enviva has described this process as one that "[enables landowners] to be a critical participant in addressing the global climate crisis," thus shifting the burden of climate change mitigation onto small landowners.¹⁴⁴ Strategies to attain carbon-neutrality rather than decarbonization do not address the root cause of the climate crisis but, instead, contribute to its worsening.

The transition from a forest to a monoculture plantation for the purpose of biomass causes permanent damage to both migratory and sedentary wildlife.¹⁴⁵ Both old growth and mature forests hold significant ecological value, providing habitat for a range of biodiversity that newer forests do not have the complexity to support. Range of biodiversity depends on decades of species interaction and multi-layered canopies that older trees provide.¹⁴⁶ Wildlife that lives in developed forest habitat, like the spotted owl and caribou, could not live in replanted tree farms.¹⁴⁷ Even wildlife in ecosystems adjacent to forests depend heavily on forest species, with an interconnected food web and nutrient transfer. UNIPCC has stated that expanding existing forests is vital to increasing carbon uptake to fight climate change. The only catch? It is effective only "as long as forests are fully functioning ecosystems, rather than monoculture plantations."¹⁴⁸ A group of international scientists went so far as to claim that "multiple centuries of natural succession without human disturbance" is necessary to restore a tree plantation to an established forest.¹⁴⁹

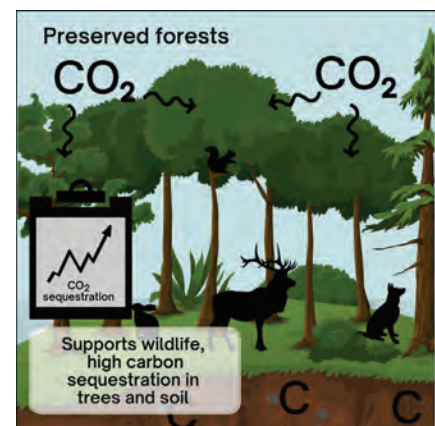
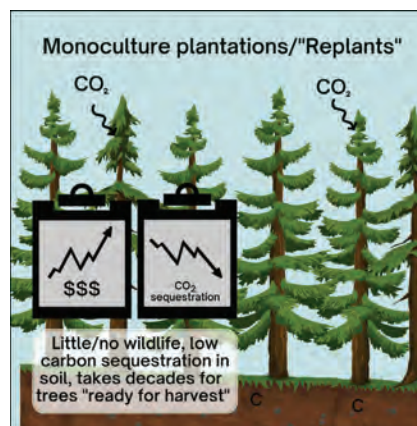
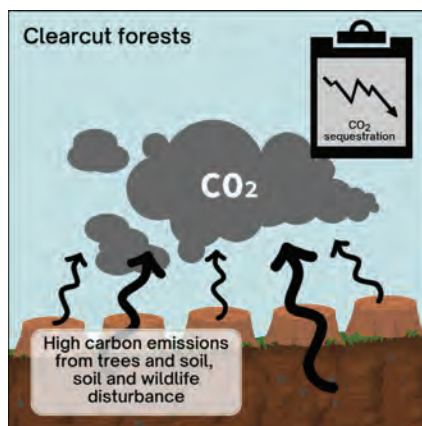
When it comes to carbon dioxide emissions and their impact on the climate crisis, planting new trees in exchange for harvesting forests is not a fair trade. It takes decades for newly planted trees to sequester comparable amounts of carbon as mature trees.¹⁵⁰ Even after twenty years when trees begin to sequester comparable amounts of carbon, the stress of continuous harvesting on the soil, where forests store most of their carbon, irreparably reduces its sequestration capacity.^{151,152} A developed forest ecosystem can store twice as much carbon as a replanted tree farm.¹⁵³

In addition to the dubious efficacy of offsetting wood pellet industry emissions with carbon credits, it is not guaranteed that companies meet their replanting goals. The Kyoto Protocol, the international climate agreement that preceded the Paris Agreement and extended the UNFCCC, mandated the replanting of trees impacted by the deforestation and logging practices of the wood pellet industry though the U.S. never signed it. Domestically, there is no legal process by which wood pellet corporations are required to plant new trees — corporate replants are entirely self-regulated.¹⁵⁴

Clearcuts, Climate, and Costs

Single-species plantations are not equipped to handle the developing climate crisis or sustain quality harvests. Mixed-species forests have a diversity of root lengths and therefore use water from different depths in the ground, while monoculture forests draw water from the same soil layers, making them more susceptible to drought.¹⁵⁵ Additionally, because they have lower genetic diversity, single-species tree plantations are more vulnerable to pest and disease outbreaks which spread more easily under warmer temperatures.^{156,157,158} Drought and warmer temperatures are two major threats associated with climate changes in the U.S. Southeast.

With each harvest, forest monocultures damage the soil and interrupt carbon and nutrient cycles, causing subsequent replants to produce less wood. The diminishing wood supply then increases pellet prices. Monoculture tree plantations are not just less resilient and ecologically damaging, but also bad business.¹⁵⁹



Forests Support Water Quality

When forests are razed for the production of wood pellets, their abilities to provide clean water and protect ecosystems are diminished. Mature forests provide the highest quality drinking water.¹⁶⁰ As streams and rivers feed into reservoirs or groundwater aquifers, forests can regulate the flow of water and reduce soil erosion by intercepting rainfall to reduce its speed.^{161,162} As water seeps through the forest floor, the soil filters out contaminants like heavy metals and suspended sediment while plants absorb excess nutrients from agricultural fertilizers.^{163,164,165} Forests also support aquatic ecosystems and habitats by stabilizing river banks with their root systems and regulating stream temperatures by providing shade.^{166,167,168}

The Cost of Damaged Water Infrastructure

“When the trees are gone, the water table rises” - Charles Robbins

As healthy, biodiverse forests regulate water quality, deforestation invites rising water filtration and treatment costs. It is estimated that for every 10% loss of forest cover, the expense of chemical water treatment increases by 8.7%. For the average treatment plant, that translates into an additional cost of \$65,000 each year.¹⁶⁹ Conversely, it is expected that every 10% increase in forest cover is associated with a 20% decrease in water treatment costs: forests are integral to high water quality.^{170,171}

In one of the most successful watershed protection projects in history, New York City spent \$1.5 billion on forest restoration and conservation in the Catskills.¹⁷² The one-time investment saved the city the \$6 billion cost of building a new water filtration plant and the annual operational cost of \$300 million.¹⁷³

In a personal interview, Charles Robbins, the captain at Cape Fear River Adventures in North Carolina, emphasized the importance of transpiration, which is the evaporation of water through leaves, and the impact of clear cuts on flooding.¹⁷⁴ According to Robbins, a single oak tree can transpire anywhere from five to 50,000 gallons of water a day, cooling both the surrounding environment and releasing groundwater back into the atmosphere. He also shared that upstream along the Northeast Cape Fear River, the impacts of clear cuts were immediate. The same season that a forest was clear cut near Burgaw, North Carolina, the surrounding towns flooded for the first time in history.

“That’s because when the trees are gone, the water table rises,” Robbins explained. With no forests to regulate the water table through transpiration, the land more readily floods with rainwater.

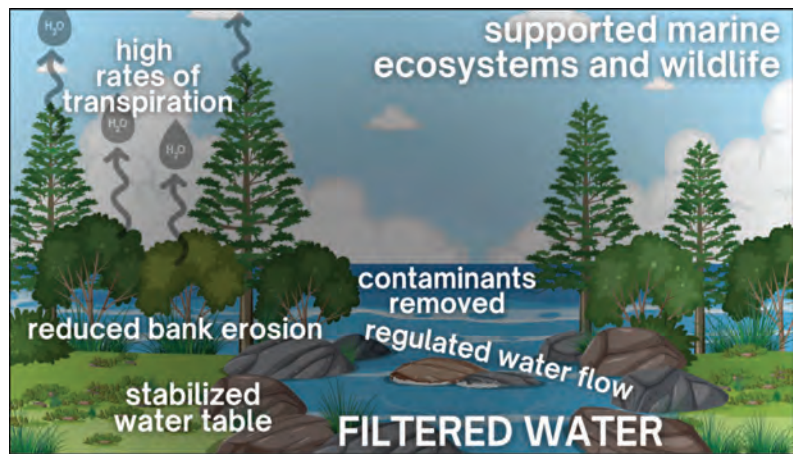


Disaster Relief

Forest removal invites growing demand for programs that stabilize riverbanks and streambanks. Without natural filtration and water flow regulation from forests, streambanks are eroded and filled with sediment. According to Vincent Cotrone, an urban forestry expert at Penn State University, streambank stabilization efforts cost nearly \$1 million per mile in taxpayer revenue, money that could be spent on taxpayer services instead being channeled into addressing environmental degradation for industrial activity.¹⁷⁵

As forests shrink, disaster relief costs and damage will escalate. Because forests stabilize coastal ecosystems and streams, their decline is associated with greater damage from climate-

related storms. The climate crisis has accelerated the frequency and increased the scale of storms and extreme weather, especially in coastal areas. Deforestation forces communities to experience the destabilization of slopes, leading to more landslides, increased flooding and sediment runoff, and rising riverbeds.^{176,177} It is estimated that if forests and wetlands are protected, at-risk coastal communities will save \$23 billion annually.¹⁷⁸



Environmental Justice Concerns

“... Respiratory health impairments can be directly tied to pollutants emitted from wood pellet plants”

A review of the wood pellet industry would be incomplete without addressing its impact on low-income communities, communities of color, and indigenous communities.¹⁷⁹ Wood pellet plants, ports, and incinerators are consistently located in and around these communities, causing residents to suffer from environmental health risks and noise pollution, disproportionately. A 2018 study of biomass facilities in the Southeastern U.S. found that environmental justice (EJ) communities, defined by the study as a county with above-median poverty levels and more than 25% of nonwhite residents, were 53% more likely to contain a biomass plant than non-EJ communities.¹⁸⁰

Enviva has constructed four major plants in North Carolina, all of which are located in counties experiencing high economic stress and poverty rates.¹⁸¹ The national rate of poverty is 11.6%, which is far lower than the rates in Hertford County (24.5%), Northampton County (23.6%), Sampson County (20.4%), and Richmond County (26.2%).¹⁸²

Drax has three sites in Alabama — Aliceville, Demopolis, and Mobile. The poverty rates in these cities are much higher than the national average, with nearly one-fifth of the populations of Demopolis and Mobile and approximately two-fifths of that of Aliceville living in poverty.¹⁸³

Wood pellet plants disproportionately impact ethnic and racial minority groups, as well. For example, the biomass firm, Active Energy operates in Robeson County, North Carolina, where the population is 37% Native American and 22% Black.¹⁸⁴ The plant polluted the local river without a permit. The Southern Environmental Law Center (SELC) sued the company on behalf of Robeson County residents, as Active Energy had taken advantage of systemic inequities that constrain residents' access to information and resources that would have empowered them to take action.¹⁸⁵ The damage to public health and the environment that Active Energy wrought on the county is not an isolated incident, but the industry norm.

Enviva's sites are consistently placed in counties with higher Black populations than the national average of 13.6%. Hertford County, where its Ahoskie plant is located, and Northampton County have majority Black residents while the populations of Sampson County and Richmond County are 25.8% and 32.3% Black, respectively.¹⁸⁶ Drax biomass plants are similarly located in primarily Black communities.¹⁸⁷ Drax's three Alabama plants in Aliceville, Demopolis, and Mobile, each have over 40% Black populations.¹⁸⁸ Louisiana also hosts a number of Drax's plants in cities like Bastrop and Monroe, which have respective 78.5% and 59.7% Black populations and poverty rates approaching three to four times the national average.¹⁸⁹ Companies like Enviva and Drax target marginalized communities at the expense of their health and wellbeing.

The U.S. Department of the Interior is also complicit in targeting communities of color, including indigenous groups, for woody biomass development. The U.S. Department of the Interior's Tribal Biomass Demonstration Project claims biomass plants in Native communities provide "effective and accessible... energy resources [for tribal groups], generate revenue and improve the well-being of their communities."¹⁹⁰ However, these claims ignore the long-standing significance of forests for practices steeped in indigenous cultures such as canoe-carving, totem pole and mask making, as well as providing food and medicines.¹⁹¹

Gloster, Mississippi and Drax: Environmental Injustice on Display

Mississippi residents have spoken out numerous times since 2014, when Drax built a new plant in Gloster. Black residents make up 77% of Gloster's population and 41% of residents earn an income below the poverty line.¹⁹²

Resident Myrtis Woodward spoke out against the wood pellet giant on behalf of the community, asserting that the Drax plant had caused serious health problems among residents since arriving in town.¹⁹³ Woodward herself has had to resort to using "medical oxygen, a nebulizer, an inhaler, and a nasal spray to treat asthma, chronic obstructive pulmonary disease (COPD) and chronic bronchitis."¹⁹⁴ A number of community members now rely on inhalers and oxygen, and experience dizziness, eye irritation, nosebleeds, rashes, and other ailments from time spent outdoors.¹⁹⁵ These health impairments can be directly tied to pollutants emitted from wood pellet plants that severely burden human respiratory function.¹⁹⁶ Even cities that border towns with wood pellet plants have experienced more trouble breathing and occurrences of asthma, with residents forced to escape the thick air, dust, and air pollution by holing up inside their homes.¹⁹⁷

People living near wood pellet plants have also had to endure disturbing smells and noises. Another Gloster resident, Carmella Wren-Causey, said that the air surrounding pellet plants is comparable to "rotten flesh."¹⁹⁸ Residents nearby pellet plants succumb to "round-the-clock noise" from plant operations, delivery trucks, and trains.¹⁹⁹

How Do They Get Away With It? The Myth of Carbon Neutrality

Why Wood Pellets Are Not Carbon Neutral: A Supply Chain Analysis

U.S.-sourced pellets burned in the U.K. emitted 13 to 16 million metric tons of carbon dioxide from production to combustion in 2019, the equivalent of annual emissions from about three million cars.^{200,201} However, existing international and domestic government policies treat biomass as a carbon neutral energy source without accounting for lifetime carbon dioxide emissions. These institutions ignore three stages in which carbon dioxide is emitted: (1) tree cutting, (2) transportation of pellets, and (3) combustion of pellets. After obtaining wood pellets through clear cuts, which, as previously established, is a carbon-intensive process, woody biomass firms like Enviva and Drax have high transportation emissions, as most of their clients are international. The combustion of fossil fuels from container ships transporting pellets across the Atlantic Ocean releases considerable greenhouse gas emissions which are excluded in carbon emission totals.^{202,203} Finally, carbon emissions from biomass burning are not included in U.S. national greenhouse gas inventories, as most burning is done outside of the country by international clients.²⁰⁴ Conversely, the EU and U.K. exclude emissions from deforestation and transportation, and only include emissions from burning pellets.²⁰⁵ Current policy frameworks do not account for lifetime carbon dioxide emissions, which has empowered governments to invest in and expand the biomass industry, increasing net carbon emissions.²⁰⁶ Because a wood pellet plant's emissions do not include those from the entire lifecycle, carbon accounting is skewed and wood pellet producers can more easily obtain carbon neutrality on paper.

Weak Sustainability Standards in Certification

Similar to overlooked lifecycle emissions in carbon accounting, shortcomings in certification systems substantiate biomass companies' false claims of environmental stewardship and carbon neutrality.

All certifications are voluntary and there is currently no legal requirement for biomass facilities to meet any sustainability criteria. Additionally, most small landowners from whom pellet plants source their wood do not obtain these certifications because of the cost and length of the process.²⁰⁷

A common criticism of the standards set forth in such certifications systems is that these "sustainability stamps" are, in the words of David Gehl of the EIA, made "by the industry for the industry" in other words, they do not meet any rigorous sustainability standards.^{208,209,210} The following table shows some of the most common certifications in the wood pellet and logging industries, and the major shortcomings of each.

	SBP	ACR	FSC	SFI	PEFC
	<i>Sustainable Biomass Program</i>	<i>American Carbon Registry</i>	<i>Forest Stewardship Council</i>	<i>Sustainable Forestry Initiative</i>	<i>Programme for the Endorsement of Forest Certification</i>
<i>Role of Certification Shortcomings</i>	Assures “that woody biomass is sourced both legally and sustainably.” ²¹¹	Promises planting new trees for carbon offsetting. ²¹²	Certifies that wood “comes from responsibly managed forests that provide environmental, social and economic benefits.” ²¹³	“Allows organizations to show the raw material in their supply chain comes from legal and responsible sources.” ²¹⁴	Guarantees that forests are managed “in line with challenging environmental, social and economic requirements.” ²¹⁵
<i>Shortcomings</i>	<p>Does not measure lifecycle emissions of carbon dioxide and other GHGs.²¹⁶</p> <p>Risk assessments are conducted by biomass producers who also “choose their own verifiers and data sources.”²¹⁷</p> <p>Does not include “concrete thresholds” or “data collection methods.”²¹⁸</p>	<p>Does not define requirements for lifecycle carbon emissions.</p> <p>Sustainability field evaluations may be substituted with photographs or employee interviews.²¹⁹</p>	<p>The compliance requirement is “flexible,” to account for landowners making mistakes in “implementing management practices.”²²⁰ Landowners are only forced to correct these mistakes after attaining “full knowledge.”</p> <p>“Forests of recognized importance,” can’t be used as sourcing material, but this term is undefined.</p> <p>Does not require any consultation with tribal representatives.</p> <p>Does not require a search for threatened and endangered species or regulate pesticide use.²²¹</p> <p>Does not contain water quality standards.</p>	<p>Recognizes indigenous rights but doesn’t require consultation with tribal representatives. Recommends reduced waste and encourages sustainable harvesting without setting any requirements or specific procedures.</p> <p>Requires documentation on biodiversity, soil, and social impacts. However, there are no requirements for the level of protection for forests and species.</p>	<p>To increase forest certification in the forest industry, the PEFC implements lax standards.</p> <p>Third party companies certify sustainability, but the agencies hired “often display a lack of expertise on visits to logging operations.” These agencies downplay environmental concerns and turn a blind eye to “fraud and misreporting of information.”²²²</p>
<i>Does Enviva Have This Certification?</i>	✓		✓	✓	
<i>Does Drax Have This Certification?</i>	✓		✓	✓	

Sustainability Loopholes in the Clean Air Act

Enviva, Drax, and other biomass plants exploit allowances in the Clean Air Act to their advantage. To protect citizens from industry-emitted “nitrogen oxides, VOCs, hazardous air pollutants (HAPs), and microscopic dust particles” that impede human respiratory function, the Clean Air Act requires plants to obtain air permits prior to construction.²²³ There are two types of air permits that biomass facilities can obtain prior to construction: the Title V permit and the synthetic minor source (SMS) permit. Based on the permit obtained, different limits are set for pollutant emissions at a facility. North Carolina, a state with a high concentration of wood pellet plants, sets the following limits for these permits:²²⁴

A North Carolina synthetic minor source permit sets the following emission limits:

- Less than 100 tons per year for each criteria pollutant.
- Less than 10 tons per year for each individual hazardous air pollutant (HAP)
- Less than 25 tons per year for the sum of all hazardous air pollutants (HAPs)

A North Carolina Title V permit is for those plants exceeding emissions of:

- 100 tons per year of a single criteria air pollutant,
- 10 tons per year of a single hazardous air pollutant (HAP)
- 25 tons per year for a combination of singular hazardous air pollutants (HAPs)

There are several benefits of attaining SMS permit plants in exchange for the guarantee of fewer emissions. SMS permits do not require the holding of public hearings or include public participation in the permitting process, unlike Title V permits.^{225, 226} The Title V application process is much more complicated than the SMS permit process. Applicants complete more paperwork and obtain multiple signatures from various offices, which are not publicly named.²²⁷ The SMS permit is approximately a tenth as expensive as the minimum fee for a Title V permit. A Title V permit cost can increase corresponding to the volume of annual pollution and is charged on a per-ton basis compared to the SMS permit, another strong incentive for obtaining the latter. In North Carolina, the SMS fee is \$1,900, while the Title V Permit fee costs a minimum of \$17,856.²²⁸ After completing the initial permitting process, SMS permit holders can continue production with little to no oversight from the EPA or the public.²²⁹ As a result, wood pellet plants operate under fewer regulations than coal plants.²³⁰

Note: Carbon dioxide is not considered a VOC (volatile organic compound) or HAP (hazardous air pollutant) and is exempt from consideration in air quality permitting.

SMS permits, including construction permitting, are expedited under the Clean Air Act, and rely on the company to voluntarily limit their air pollution to qualify as a “synthetic minor source” of VOCs. VOCs reduce air quality and can lead to eye and throat irritation, and, in extreme cases, lung and heart disease.^{231,232,233} Additionally, the Environmental Integrity Project, a nonprofit watchdog organization, found that a SMS-permitted Drax plant in Amite County, Mississippi, emitted four times the predetermined acceptable level of VOCs.²³⁴ An internal EPA report suggests that there is insufficient enforcement at the minor source level, stating that additional communication and enforcement is necessary from the agency.²³⁵

In the near future, Georgia expects construction of three major pellet plants, two of which will be located in Adel, Georgia.²³⁶ Dogwood Alliance has been actively monitoring plans for one of them, the Renewable Biomass Group's Spectrum Energy wood pellet plant.²³⁷ The plant was approved for construction and has an annual production capacity of 450,000 dry metric tons.²³⁸ It is expected to begin production in 2024, and is not required to hold public hearings as Georgia's Department of Natural Resources has labeled the plant as a "minor" source of carbon emissions. This designation flies in the face of the fact that the plant will emit "nearly 800 tons of regulated air pollutants each year, including nearly 100 tons of fine particulate matter, 250 tons of nitrogen oxides, and 216 tons of volatile organic compounds."²³⁹ Public hearings about the status of these plants are only required by law if they are deemed "major" sources of pollutants.

Spectrum Energy is constructing a plant in Adel with a maximum capacity of 1.2 million dry metric tons per year, which will be about 1.5 times the size of the current largest wood pellet plant in the U.S.^{240,241} Spectrum's plant obtained a Title V permit, which required the plant to hold public hearings for community members. The company's agreement with the public included more air quality monitoring and set high penalties for violation of air quality provisions, as pointed out by the RCC.²⁴² Wood pellet firms have historically been complicit in public health crises of Black and Hispanic communities, and Adel's residents already suffer a number of health problems as a result of emissions from the biomass plants.²⁴³ Therefore, Council is closely monitoring Spectrum's activity to hold the company accountable to the terms of their permit.

In Northampton County, North Carolina, an Enviva plant violated its SMS permit, but did not face appropriate consequences. The plant obtained an SMS permit, then emitted 200 more tons of VOCs than allowed for SMS sites. If these sites breach the emissions limit, they are required to implement technology to control emissions and obtain a Title V permit. However, the state of North Carolina allowed Enviva to continue producing pellets without VOC controls. Thus, Northampton County's Enviva plant does not have to not comply with North Carolina's Clean Air Act standards, enabling it to emit up to 456 tons of VOCs per year.²⁴⁴

Carbon Capture and Storage: Technology of the Future?

Another "carbon-neutral" workaround strategy implemented by the wood pellet industry is carbon capture and storage. Carbon capture and storage removes carbon dioxide from the atmosphere, and typically liquefies it into a form that can be stored underground. Drax rolled out its bioenergy with carbon capture use and storage (BECCS) program in 2018.²⁴⁵ The program, into which Drax is investing \$2.5 billion, is expected to create numerous plants and expand existing plants, while being funded almost entirely by subsidies.²⁴⁶ Drax's BECCS program promises to store carbon dioxide emitted by the company's plants, allowing it to turn a profit by receiving payment for each metric ton of carbon capture.²⁴⁷ However, Almuth Ernsting, co-director of the environmental organization Biofuelwatch, has warned that Drax achieved this carbon-neutral status despite having yet to sequester a single pound of carbon.²⁴⁸ Additionally, BECCS has not stood up to tests of reliability or sustainability as it cannot keep up with the size of forests that are lost.^{249,250}

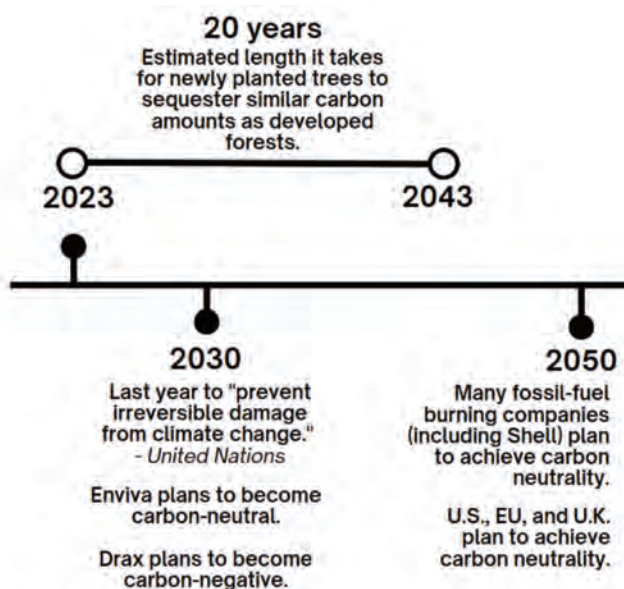
Furthermore, despite carbon-neutral commitments, wood pellet companies retain unsustainable and high-carbon-emitting practices, like clear cutting.²⁵¹ The U.S. Securities and Exchange Commission (SEC) has stated that biomass pellet burning plants emit more carbon dioxide per megawatt-hour than fossil fuel plants because of differences in energy content per carbon unit and

moisture content that degrades the efficiency of pellets.²⁵² A report from the Partnership for Policy Integrity estimates that biomass plants emit almost 50% more carbon dioxide per megawatt than coal.²⁵³ Even when plants have accurately adjusted for these emissions with offsets, it takes decades to neutralize the emissions released from wood pellet production and burning.²⁵⁴

Carbon Neutrality Timelines

Perhaps the biggest deceit of carbon neutrality is that most companies are rewarded for declaring carbon neutrality plans that will not be implemented in time to prevent the most severe consequences of climate change. Shell, like many other fossil fuel-emitting companies, has set its carbon-neutral goal for the year 2050.²⁵⁵ These carbon-neutral proposals, by fossil fuel corporations and wood pellet manufacturers alike, are not in line with the 2030 deadline set by the UN to avert permanent environmental degradation, and its recommendation is that nations begin cutting carbon emissions by 2021.^{256,257} However, in 2021, carbon emissions grew six percent to 36.3 billion metric tons, the highest recorded amount in history.²⁵⁸ Though emissions dropped the next year by 1.5%, current trends indicate that “global temperature is on track to rise by 2.5 °C to 4.5 °C by 2100,” which is well over the recommended two-degree threshold.^{259, 260}

Despite the alarming timeline, the U.S., EU, and the U.K. have all set their carbon neutrality goals for 2050.^{261, 262, 263} Enviva does have goals to become carbon neutral by 2030, and Drax boasts an ambitious goal of “carbon-negativity” by 2030, using BECCS. Yet, both companies plan to continue current harvesting strategies, whose carbon emissions will take decades to neutralize. Considering this timeline, the only way for the woody biomass industry to achieve net-neutral carbon emissions by 2030 is through carbon capture technology, like Drax’s BECCS, while conserving existing forests. Continued forest degradation and replanting do not align with the rigor of this timeline. Endorsing biomass companies as carbon neutral gives them the green light to continue contributing to a climate crisis by implementing solutions that will not address carbon dioxide emissions in time.



Why Haven’t We Called Their Bluff?: The Wood Pellet Industry and Greenwashing Strategies

To bolster their environmentally friendly image, wood pellet companies use greenwashing marketing strategies. For instance, they employ environmental imagery, like pictures of trees and other natural ecosystems, to influence public perception. A study published in the *Journal of Cleaner Production* found consumers in Italy associate the color green with eco-friendly products. In surveying consumers

of chocolate bars, the same study found the preference for a chocolate bar increased when the color of the label was green instead of the original packaging.²⁶⁴ Consumers have also been found to associate advertisements featuring vibrant ecosystems, such as rain forests or creeks, with positive emotions, as compared to ecosystems like deserts or urban settings.²⁶⁵

Enviva and Drax are both intentional in their public marketing, using these tactics to their advantage. Enviva, for instance, emblazons a green color scheme throughout its website and an infinity sign as its logo. Website images include scenes of smiling faces, full, brightly shining forests, parents or grandparents with small children, and the Appalachian Mountains. Additionally, when a consumer goes on the website, the first call to action they see encourages “fight[ing] climate change.”

Drax markets similarly. It sports a modern font and logo on its website and a blue/green color scheme. The firm’s homepage displays press releases, which include Drax’s donations, photographs of smiling workers, and aerial shots of farms and cities. As viewers scroll down, they can read about Drax’s “ambitious decarbonization goals” and how the company is innovative in reducing carbon emissions and see appealing images of shipping vessels that, in reality, heavily contribute to the company’s carbon footprint.²⁶⁶ Drax also uses confusing wording and excludes statistics when making environmental statements. For example, the firm states that it does not use “biomass that increases harvesting above the sustainable capacity of forests,” a statement that fails to define “sustainable capacity” and excludes harvest percentages.²⁶⁷ It’s comforting to think that national governments, international institutions, and investors are immune to the cheap marketing tactics of Big Biomass, but their continued propagation of the industry calls their good sense into question.

Conclusion

In a personal interview, biogeochemist Dr. William Schlesinger highlighted how greenwashing and vetting inconsistencies can influence government agencies. Schlesinger is President of the Cary Institute of Ecosystem Studies and former member of the EPA’s Science Advisory Board (SAB), which has stated that it does not have an “approach for consistently assessing” net carbon dioxide emissions for wood pellet biomass.²⁶⁸ He did not seek renomination to the board as he was “horrified” after the committee did not accept comments or revisions to a report endorsing biomass energy as carbon neutral.

Since 2015, Schlesinger has been investigating common greenwashing topics in his blog, *Translational Ecology*. The blog covers various topics subject to misinformation, including the workings of wood pellet energy. Two major aspects of checking for misinformation are finding consistency and replication in peer-reviewed literature making dubious claims such as “. . . biomass energy is better than coal.”

Though consumer demand for renewables is increasing, the U.S. has a long road ahead in providing clean energy for all. It’s easy to get lost when looking through a green-tinted windshield, making it difficult to distinguish the polluters from the eco-conscious. But we must remember that not all “renewable” energy is clean. Along the way, there will be some logs in the road, but the U.S. should steer clear of the misleading directions disguising clear cuts as sustainable forestry. Speed bumps in the form of legislative loopholes and biomass marketing make it tempting to turn back around, but the scenic route is worth it.

If the nation stays on the right path, the windshield will wipe clear, allowing it to realize that biomass is not carbon neutral. Outside the window can be seen the many environmentally degraded communities left behind as the biomass industry expands and the U.S. continues on the path with a

carbon emitting vehicle. But little did the nation know, the road forward leads to a station where you can switch onto a carbon neutral train!

Despite advertising from the wood pellet industry, pellets emit more carbon dioxide than coal.²⁶⁹ Coal overtook woody biomass as the global primary energy source in the 19th century, due to its energy density, which is three times that of biomass, and its record-high levels of energy efficiency.²⁷⁰ The Drug Enforcement Administration affirmed this analysis, and stated that woody biomass is “not cost competitive with existing fossil fuels, except when generated in large quantities as a waste product.”²⁷¹ An EU-funded report published in 2021 agreed that woody biomass will become less competitive over time, as it is not a sufficient form of energy, demand is too costly, and supply is insufficient for it to become widespread, not to mention the “major [environmental] trade-offs.”²⁷²

Recommendations

“I don’t believe anything that the industry puts out, because their bottom line, their motivation, is making money” – Dr. William Schlesinger

The Rachel Carson Council makes the following recommendations to policymakers to prevent the continued greenwashing campaign of the wood pellet industry and curb the potential for climate crisis at the hands of the wood pellet-to-energy scheme:

- 1. Streamline and standardize sustainable label program requirements:** Governments and certification programs should require explicit emissions thresholds and adherence to strict regulations for wood pellet plants to earn the label, “sustainable.” Certification administrators, like the Forest Stewardship Council, should directly address flaws, such as vague definitions and standards creating loopholes, in evaluations of forest removal. The Sustainable Forestry Initiative should address water quality monitoring, and the American Tree Farm System should include southeastern U.S. forests as “high conservation value forests.”²⁷³
- 2. Mandate RSB certificate for all U.S. plants:** The Roundtable on Sustainable Biomaterials (RSB) sets global standards for sustainable biomass production. The RSB limits forest residue collection to reduce GHG emissions by 50% or more than the fossil fuels required to produce the same amount of energy but has yet to be widely adopted. To truly achieve emissions reduction goals, the U.S. should mandate an RSB certificate on all pellet plants.²⁷⁴
- 3. Introduce larger fines and suspensions for repeated pollution violations:** For Title V and SMS permit violations, facilities must face severe consequences to prevent further offenses, such as loss of subsidy eligibility, responsibility for cleanup and restoration to a standard determined by the latest Society for Ecological Restoration standards,²⁷⁵ and providing compensation for impacted communities. Facilities must also automatically obtain Title V permits if found to be in violation of an SMS permit.

4. Support small forest landowners in forestry certification processes: Only about 17% of Southeastern U.S. forests are protected or certified sustainable, due to the difficulty of achieving these statuses.²⁷⁶ Policymakers should integrate a framework to provide small landowners financial assistance and guidance to protect their forests, while maintaining high standards for forest harvesting. Increasing forest protections will help limit sourcing materials for woody biomass companies. Funding programs should prioritize environmentally vulnerable and marginalized communities and landowners.

5. Revise and legally mandate Federal Trade Commission “Green Guides”: The Federal Trade Commission’s “Green Guides” for environmental marketing states that a “marketer should not make unqualified renewable energy claims, directly or by implication, if fossil fuel, or electricity derived from fossil fuel, is used to manufacture any part of the advertised item.”²⁷⁷ As trees can grow back within much shorter periods than fossils take to form, woody biomass is considered renewable. This careful wording separates biomass from nonrenewable energy, failing to consider substantial carbon dioxide emissions and allowing wood pellet companies to masquerade their products as sustainable and carbon neutral.²⁷⁸ Revising and mandating these Green Guides to distinguish clean renewable energy, such as solar and wind, from high-carbon-emitting energy like biomass would force biomass firms to adjust their advertising, encouraging transparency and honesty.

It is important for both citizens and policymakers to recognize greenwashing in the energy sector and make informed decisions to restrict policy that keeps harmful, polluting companies in business. Dr. Schlesinger said it best: “I don’t believe anything that industry puts out, because their bottom line, their motivation, is making money.” Rather than trusting statements from profit-hungry biomass corporations, the policymaking institutions must return to scientific and corroborated evidence of sustainability. Additionally, policymakers’ energy legislation must reflect the needs of their constituents under the increasing threats of climate change. In *Greenwashing*, the Rachel Carson Council reaffirms Rachel Carson’s message from over 61 years ago in *Silent Spring*:

“We stand now where two roads diverge. But [...] they are not equally fair. The road we have long been traveling is deceptively easy, a smooth superhighway on which we progress with great speed, but at its end lies disaster. The other fork of the road — the one less traveled by — offers our last, our only chance to reach a destination that assures the preservation of the earth.”

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The Rachel Carson Council is the national environmental organization envisioned by Rachel Carson and founded in 1965 to carry on her work after her death. We promote Carson's ecological ethic that combines scientific concern for the environment and human health with a sense of wonder and reverence for all forms of life in order to build a sustainable, just, and peaceful future.

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