Global Markets for Biomass Energy are Devastating North American Forests

DOGWOOD ALLIANCE

NRDC

SELC SOUTHERN ENVIRONMENTAL LAW CENTER

CUT EMISSIONS NOT FORESTS

CLEARCUTTING NORTH AMERICAN FORESTS IS NOT A CLEAN ENERGY SOLUTION

Global demand for wood pellets to burn for biomass energy – primarily in the UK and Europe – is devastating forests in the Southeast United States and in Canada. Investigations by media, independent watchdogs, and NGOs over the past decade expose the damaging logging practices used by Enviva – the world's largest wood pellet manufacturer – to supply wood pellets to the biomass industry, including the clearcutting of iconic wetland forests. Enviva then ships pellets from these ravaged forests to utilities overseas, such as the UK's Drax Power Station.

Climate and energy policies in Europe and beyond persist in treating biomass as a "carbon neutral" source of renewable energy and offering utilities lucrative incentives to increase reliance on biomass electricity. But the investigations described and depicted herein provide evidence that the supply chain for biomass is anything but "clean." Instead, despite industry claims to the contrary, wood pellets burned by Drax and others come from wood taken from native hardwood forests in an area of the U.S. deemed a global biodiversity hotspot.[1] This includes vast quantities of whole trees and other large-diameter wood logged via clearcutting, which is the most destructive of all logging practices. Recent satellite research reveals that wood pellet demand has increased hardwood harvesting in Enviva's sourcing areas.

This is worsening the climate crisis. Forests are a giant storehouse of carbon, storing more carbon than all our known exploitable deposits of oil, gas, and coal and sequestering or "sucking up" a third of all anthropogenic carbon emissions.[2] When forests are logged, the trees release their stored carbon into the atmosphere and lose the ability to sequester more carbon–referred to as "foregone sequestration."[3] Releasing even a small percentage of this stored carbon or reducing the amount of carbon our forests suck from the air will make it infinitely harder to avoid climate devastation. Further, burning biomass from forests for electricity creates more carbon dioxide emissions than burning coal and increased carbon dioxide concentrations persist in the atmosphere for decades or more.[4]

This is also devastating for biodiversity at a time when our planet faces the extinction of one million species.[5] Much of the logging depicted in this booklet occurs in the North Atlantic Coastal Plain Biodiversity Hotspot—one of only two biodiversity hotspots in the United States. These areas are irreplaceable, covering only 2.5% of the earth's surface but containing almost half of its species.[6] The clearcutting of forests in this area harms many unique plant and animal species, including at least 30 species of birds that are the focus of conservation efforts like the Wood Stork, the Bachman's Warbler, the Ivory-billed Woodpecker, the Chimney Swift, and the Rusty Blackbird (the latter two of which are "threatened with extinction" on the IUCN Red List).[7]

Sourcing for biomass in the U.S. Southeast is harming environmental justice communities—that is, communities that are home to people of color living below the poverty line. Pellet mills are fifty percent more likely to be built in such communities.[8] These mills emit hazardous or toxic air pollutants, including particulate matter, volatile organic compounds, and dust, that can cause cancer and other serious health impacts.[9] The noise pollution from the wood pellet facilities is loud and constant, and can cause stress-related illnesses, high blood pressure, and heart disease, among other medical problems.[10] The logging of nearby forests also leaves these communities vulnerable to the increasingly frequent storms caused by climate change.[11]

In Canada, biomass is sourced from industrially logged areas of the Boreal forest the largest remaining intact forest on earth. Much of the logging in Canada takes the form of clearcutting, typically targeting older stands that support rich and unique biodiversity such as the woodland caribou. The Canadian Boreal is home to billions of birds of over 300 species, many of which breed there and rely on its forests and wetlands.[12] A February 2024 investigation showed that Drax continues to use trees from primary and old forests – some of which are over 250 years old – to make wood pellets in Canada.[13] After a BBC Panorama investigation in 2022, Drax shifted its sourcing policy away from logging its own trees and towards buying trees from other companies. But investigations show that in British Columbia these trees are still originating from primary forests, old growth forests, and ancient forests.[14] Often, the clearcut forests are replanted with less diverse and less resilient species of saplings.[15] Under the existing sustainability scheme, Drax power station has very likely burned wood from primary and old growth forests in Canada. In fact, leaked emails from Drax show that internally the company acknowledged it had likely burned this material.[16]

This booklet includes photos from yearly investigations conducted in the U.S. Southeast from 2014 to present, and more recently in Canada as well (excluding 2020, when the investigation was cancelled due to COVID-19).

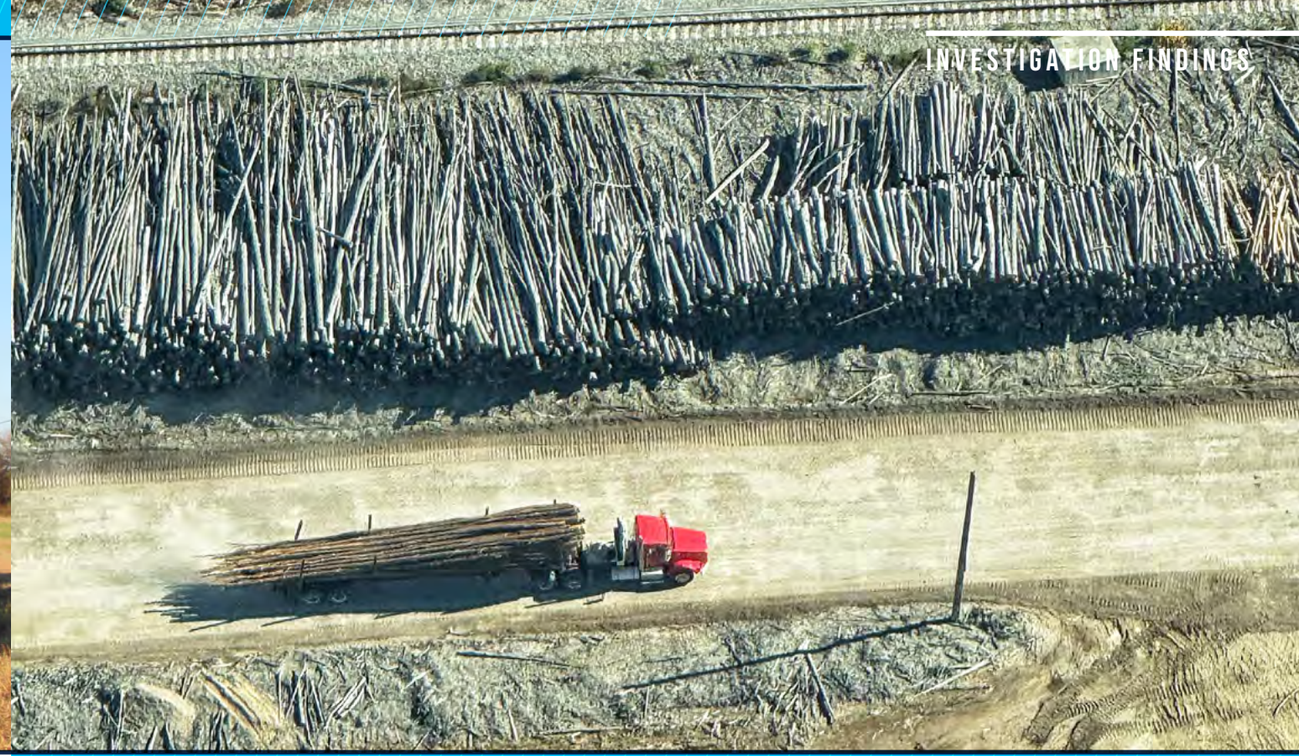
PHOTO CREDIT: DESIREE WALLACE / STAND.EARTH 2025

2025

PHOTO CREDIT: DESIREE WALLACE / STAND.EARTH 2025

BRITISH COLUMBIA

New investigative research from Stand.earth and published exclusively by The Guardian in November 2025 reveals that Drax purchased logged trees from at-risk old growth forests in British Columbia in 2024, and very likely in 2025, to supply its wood pellet plants.[17] Drax's Houston, Burns Lake and Meadowbank pellet plants in British Columbia received at least 3,039 truckloads of whole logs that the company purchased from forests containing old growth. Of those, 90 truckloads contained confirmed coastal old growth from three cutblocks, which consisted predominantly of trees classified as over 250 years old. Stand investigators also visited the Burns Lake pellet yard multiple times in June and August of 2025, documenting large piles of logs, including some that they aged as well over 200 years old by counting rings.



U.S. SOUTH

In late 2025, investigators documented approximately one log truck every 3-4 minutes entering Enviva's pellet mill in Northampton, North Carolina. Recent data submitted by Enviva to the state environmental agency show that 65-67% of the wood used at the Northampton mill is hardwood.

A forestry expert with decades of experience working within these forests reviewed photos taken from the investigation and identified a mix of hardwood species—Maple, Oak, Hickory, as well as possibly Elm, Yellow-Poplar, Sweet Gum, and Black Gum. More than two-thirds of the hardwood logs in the attached photo appear to be sawtimber size, with the largest estimated at approximately 19 inches diameter.

Hardwood forests within the North American Coastal Plain, where Enviva's pellet mills are located, are some of North America's most valuable ecosystems; they provide key habitat to many at-risk species, including migratory songbirds, purify the air and improve water quality, and store large amounts of carbon.

2025

PHOTO CREDIT: TV2 DENMARK AND SOUTHWINGS

2024

PHOTO CREDIT: TV2 DENMARK AND SOUTHWINGS

NOVEMBER 2024

In 2024 Danish journalists investigated Enviva's wood pellet plant near Waycross, Georgia. Many of the wood pellets produced here are shipped to Denmark, one of the largest biomass burners in Europe, after the United Kingdom. In Denmark around two thirds of renewable energy comes from burning biomass. The Danish Government has tried to put in place policies preventing the burning of pellets made from whole trees.

According to Enviva's website, the plant has been operating since 2011 and has a capacity of 800,000 tonnes per year.

During the investigation, ten trucks carrying logs were seen entering the facility in just 30 minutes, or one truck every three minutes. When questioned by the investigative journalist, the Plant Manager admits that the logs could be used for other purposes, but they aren't, and that the biggest ones are 18-20 inches in diameter.

OCTOBER 2023

In October 2023, investigators found a 200+ acre clear-cut where hardwood trees were being chipped on site and observed trucks carrying those chips to Enviva's pellet mill in Ahoskie, NC. The site sits less than a mile from the Perquimans river, which flows into the Albemarle Sound: a 6-million-acre watershed that contains some of the largest areas of bottomland hardwood habitat in the Eastern U.S. This area has experienced tree volume decline due to harvesting, despite the forests' importance as carbon-rich peat-based soils, biodiversity habitat for imperiled species, and protection from climate-change-related storms[18].

2023

2022

NOVEMBER 2022

In November 2022, investigators found Enviva Ahoskie sourcing from a North Carolina coastal plain forest that was being cleared and advertised for future industrial development. Alongside a reporter following up on a whistleblower report[19], the investigative team found Enviva sourcing trees from a mixed hardwood-pine forest with a diversity of tree ages, including sizable old oaks. The loggers were chipping the trees on site, making sourcing verification possible only if an inspector was on site during the chipping process. Furthermore, the plan for future industrial development of the site debunks Enviva's promise to customers and regulators that it only uses wood from sites that will be replanted and remain forests.

DECEMBER 2021

In late December 2021, investigators tracked logging trucks carrying wood chips from the town of Edenton and delivering those chips to Enviva's Ahoskie, North Carolina facility. Investigators witnessed hardwood trees, including what they believe to be hickory trees, being chipped on site before going to Enviva's facility. Most coastal plain hickory species grow in mesic to wet habitats: a habitat Enviva commonly sources from.

The practice of chipping-in-field at the site poses a question to policymakers overseas: can we really ensure sustainability standards are met when we don't even know the types or characteristics of trees being brought to the facility? Chipping on site eliminates yet another opportunity to ensure chain-of-custody standards are being met.

2021

2019

APRIL 2019

In the early spring of 2019, investigators tracked logging trucks from a mature hardwood forest going to Enviva's Northampton, North Carolina facility. The clearcut was located in the Tar-Pamlico River Basin, alongside Sandy Creek, feeding into the Pamlico Sound of North Carolina.

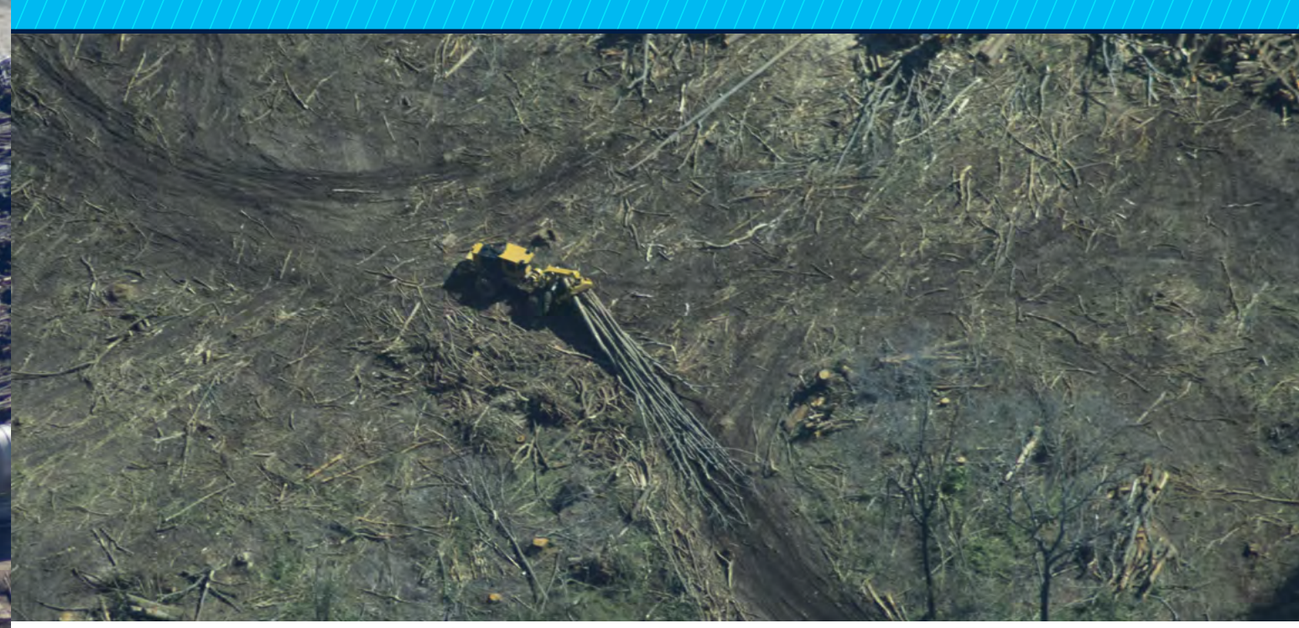
PHOTO SOURCE: CHANNEL 4 UK

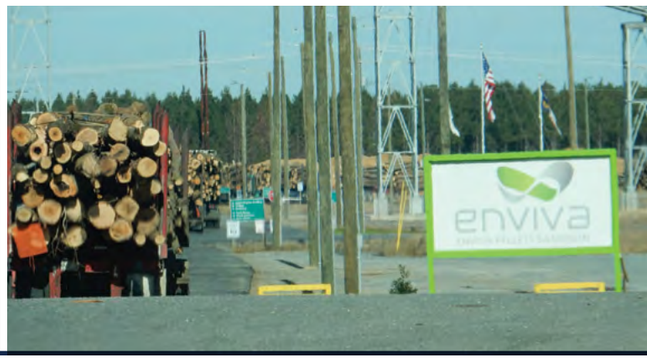
JANUARY 2018

Investigators tracked multiple logging trucks carrying whole hardwood trees and other large-diameter wood to the Enviva Southampton, Virginia facility. The cut left an area of mature wetland forest devastated as well as nearly 100 acres of surrounding natural forest.

The vast clearcut site was located less than a half-mile from the Merrherrin River, which feeds into the Albemarle Sound of North Carolina.

2018





2017

FEBRUARY 2017

Investigators tracked logging trucks carrying whole hardwood trees and other large-diameter wood from a destroyed bottomland hardwood clearcut back to the Enviva Sampson County, North Carolina facility.

The clearcut site was located in Sampson County, outside of Clinton, North Carolina.

MARCH 2016

Investigators tracked logging trucks carrying whole hardwood trees and other large-diameter wood to the Enviva Ahoskie, North Carolina facility. The cut left a large wetland area desolate.

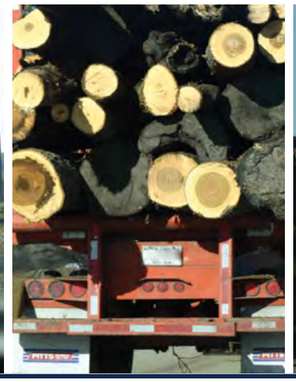
The clearcut site, captured here in aerial and drone images, was located in the Roanoke River basin in North Carolina, just outside of Williamston, North Carolina.

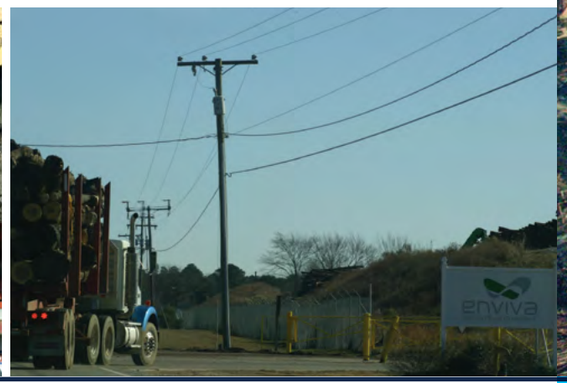
2016

2015

MAY 2015

Investigators tracked logging trucks carrying whole hardwood trees and other large-diameter wood from a devastated wetland clearcut to Enviva's Southhampton, Virginia and Ahoskie, North Carolina facilities.





DECEMBER 2014

Investigators tracked logging trucks carrying whole hardwood trees and other large-diameter wood from a wetland clearcut back to the Enviva Ahoskie, North Carolina facility.

2014

OTHER INVESTIGATIONS

In addition to the investigations depicted herein, the following investigations conducted by news outlets provide supplementary evidence of destructive logging practices used to generate wood for Enviva and Drax's pellet mills, including:

- In 2024, leaked emails published by the *Financial Times* showed that Drax staff knew that the company had likely burned wood from old forests in Canada, while court documents (from an employment tribunal) released to news organizations confirmed that Drax managers had privately questioned the veracity of public denials the company made about logging old forests in Canada.[20]
- In 2024, *The Sunday Times* published findings that wood pellet mills in the U.S. southeast owned by Drax had broken air pollution and other environmental rules and permits over 11,000 times, while an investigation published by Land and Climate Review found that the company had broken environmental rules in Canada 189 times.[21]
- Two separate investigations by *BBC Panorama* found that Drax power station had been burning wood from old and ancient forests in Canada.[22]
- In 2021, *CNN* reported how Enviva's operations are harming marginalized communities of color in the U.S. South and perpetuating decades of environmental racism. Additionally, after years of misleading claims about sourcing only "wastes and residues," CNN described how Enviva took one-quarter of the trees from a clearcut of a one-hundred-year-old wetland forest to turn into wood pellets at its pellet mill in Northampton, North Carolina, which supplies Drax.[23]
- In 2020, investigators from Dutch outlet *Eenvandaag* came to North Carolina and tracked logging trucks from a mature hardwood forest to Enviva's Northampton, North Carolina wood pellet mill.[24]
- In 2018, the UK Channel 4 News program *Dispatches* reported that a once-majestic wetland forest had been clearcut to supply wood to Enviva, and ultimately to Drax.[25]

AS FAR BACK AS 2013, INVESTIGATIVE REPORTING BY THE WALL STREET JOURNAL UNCOVERED ENVIVA'S CLEARCUTTING OF 100 YEAR OLD WETLAND HARDWOOD FORESTS FOR ITS AHOSKIE, NORTH CAROLINA MILL...

"Logger George Henerson said that earlier this year, he sold Enviva several hundred tons of hardwood that his crew clear-cut from a swamp that hadn't been logged for about 100 years.

Enviva, now they need wood bad enough that they're paying for some swamp logging," said Mr. Henerson.

- THE WALL STREET JOURNAL

SCHECK, JUSTIN AND IANTHE JEANNE DUGAN, "EUROPE'S GREEN-FUEL SEARCH TURNS TO AMERICA'S FORESTS," WALL STREET JOURNAL, MAY 27, 2013.

"It will take tens if not hundreds of years for it [the forest] to recover, if ever."

- PROFESSOR ALAN WEAKLEY, UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL, AS TOLD TO CHANNEL 4 UK, JANUARY 2018

We believe that everyone should have a clean, safe place to live, work, and play. Enviva has come in and detracted the living conditions of the community. This is what the community has to live with and it's an injustice to them.

- BELINDA JOYNER, NORTHEASTERN, ORGANIZER, CLEAN WATER FOR NC

WE MUST CUT EMISSIONS, NOT FORESTS

Policymakers and the biomass industry have for years claimed the wood pellets they burn have been sourced sustainably and, thus, meet sustainability criteria many countries have in place for such imports. Yet, the damaging practices documented in the investigations herein are all happening under the umbrella of such "sustainability" standards, proving that such criteria are not working.

Countries looking to meet their commitments under the Paris Climate Agreement and phase out coal must stop wasting scarce public resources subsidizing dirty and destructive biomass energy. Instead, policymakers in the United Kingdom, other European Union member states, and emerging markets for bioenergy around the world should redirect investments to genuinely zero-carbon energy sources like energy efficiency, solar and wind.[26] We must cut emissions, not forests.

[1] Southern Environmental Law Center. (2022). "Satellite images show link between wood pellet demand and increased hardwood forest harvesting", [in North Carolina and Virginia] https://www.southernenvironment.org/wp-content/uploads/2022/03/Biomass-White-Page.pdf.

[2] Climate and Land Use Alliance. "Five Reasons The Earth's Climate Depends on Forests," http://www.climateandlandusealliance.org/scientists-statement/ (accessed June 1, 2022).

[3] Sterman, J., Moomaw, W., Rooney-Varga, J.N. & Siegel, L. (2022). Does wood bioenergy help or harm the climate?, Bulletin of the Atomic Scientists, 78:3, 128-138, DOI: 10.1080/00963402.2022.2062933.

[4] Brack, D., Birdsey, R. & Walker, W. (2021). "Greenhouse gas emissions from burning US-sourced woody biomass in the EU and UK," Chatham House, https://www.chathamhouse.org/sites/default/files/2021-10/2021-10-14-woody-biomass-us-eu-uk-research-paper_0.pdf; European Academies Science Advisory Council. April 2017. "Multi-functionality and sustainability in the European Union's Forests," EASAC policy report 32, http://www.easac.eu/fileadmin/PDF_s/reports_statements/ Forests/ EASAC_Forests_web_complete.pdf; 500+ Scientists Tell EU to Stop Burning Trees for Energy, Feb. 11, 2021, https://www.wwf.eu/?uNewsID=2128466.

[5] IPBES. (2019). Summary for policymakers of the global assessment report on biodiversity and ecosystem services, https://zenodo.org/record/3553579#.YpeU-qjMI2w.

[6] Conservation International, "Biodiversity Hotspots," https://www.conservation.org/priorities/biodiversity-hotspots (accessed June 1, 2022); Southern Environmental Law Center. April 14, 2022. Southeast U.S. Wood Pellet Plants Exporting to Europe,https://www.southernenvironment.org/wp-content/uploads/2022/04/SELC_WoodPelletExportMap_2022_0414_maptable.pdf.

[7] Southern Environmental Law Center. (2021). Wood Pellet Industry Harms Birds of Conservation Concern in the U.S. Southeast, https://www.southernenvironment.org/wp-content/uploads/legacy/publications/Wood_Pellet_Handout_2021_FINAL.pdf.

[8] Koester, S. & Davis, S. (2018). Siting of Wood Pellet Production Facilities in Environmental Justice Communities in the Southeastern United States, https://www.liebertpub.com/doi/10.1089/env.2017.0025.

[9] Environmental Integrity Project. (2018). Dirty Deception: How the Wood Biomass Industry Skirts the Clean Air Act, https://www.sec.gov/rules/petitions/2019/ptn4-741-exc.pdf; see also Buonocore, J.J. (2021). A decade of the U.S. energy mix transitioning away from coal: historical reconstruction of the reductions in the public health burden of energy. Environ. Res. Lett. 16: 054030, available at https://legacy-assets.eenews.net/open_files/assets/2021/05/05/document_gw_01.pdf; Löfstedt, H., et al. (2017). Respiratory symptoms and lung function in relation to wood dust and monoterpene exposure in the wood pellet industry. Ups J Med Sci. 122(2):78-84. doi: 10.1080/03009734.2017.1285836.

[10] The Climate Reality Project. (2021). "Europe's Green Energy is Stripping US Communities of Green Forests," https://www.climaterealityproject.org/blog/europe-green-energy-stripping-us-communities-green-forests (accessed June 1, 2022).

[11] Dogwood Alliance, "Impacts of Wood Pellets in the U.S," https://www.dogwoodalliance.org/our-work/wood-pellet-biomass/impacts-of-wood-pellets-in-the-us/ (accessed June 1, 2022).

[12] NRDC, 2011, Birds at Risk: The Importance of Canada's Boreal Wetlands and Waterways, https://www.nrdc.org/sites/default/files/birdsatrisk.pdf

[13] Biofuelwatch, Conservation North & Bulkley Valley Stewardship Coalition, 2024, Logging What's Left: How Drax's Pellet Mills Are Sourcing Logs from British Columbia's Rarest Old Growth Forests, https://www.biofuelwatch.org.uk/wp-content/uploads/Drax-in-BC-report.pdf.

[14] *Ibid.*

[15] NRDC, 2018, Cutting it Close: How Unsustainable Logging in Canada's Boreal Forest Threatens Indigenous Rights, Wildlife, and the Global Climate, https://www.nrdc.org/sites/default/files/cutting-it-close-logging-canadas-boreal-report.pdf

[16] https://www.ft.com/content/34550e7d-9d65-4756-8ffa-53f821dd14d0

[17] Ambrose, J., Guardian, November 2025, Drax still burning 250-year-old trees sourced from forests in Canada, experts say, https://www.theguardian.com/business/2025/nov/09/drax-still-burning-250-year-old-trees-sourced-from-forests-in-canada-experts-say

[18] Lorber, J.H. & Rose, A.K. (2015). Status of bottomland forests in the Albemarle Sound of North Carolina and Virginia, 1984-2012, U.S. Forest Research Southern Research Station, e-Research Paper SRS-54, DOI: https://doi.org/10.2737/SRS-RP-54

[19] Justin Catanoso. Dec. 5, 2022. Whistleblower: Enviva claim of 'being good for the planet... all nonsense', https://news.mongabay.com/2022/12/envivas-biomass-lies-whistleblower-account/.

[20] Millard, R. and Hodgson, C., Financial Times, 2024, UK power stations burnt wood from old forests, Drax emails show, https://www.ft.com/content/34550e7d-9d65-4756-8ffa-53f821dd14d0 and Millard, R., Financial Times, 2026, Drax manager questioned public statements on wood sourcing tribunal documents show, https://www.ft.com/content/6913f97d-9065-42dd-b01f-d75f084e5278 and Ambrose, J., Guardian, 2026, Drax insiders privately raised concerns over its sustainability claims, court papers show, https://www.theguardian.com/business/2026/feb/04/drax-sustainability-claims-court-forests-power-plant

[21] Corcoran, C., Sunday Times, 2024, US plants supplying UK power station broke green rules 11,000 times, https://www.thetimes.com/uk/environment/article/us-plants-supplying-uk-power-station-broke-green-rules-11000-times-2q559pwrg?gaa_at=eafs&gaa_n=AWEtsqf337Fx7WflQMkgyZMpQXYQv50rA0RQGIV9EcI6qclepMfTzDKKx4_ONXn00zc%3D&gaa_ts=696f9db8&gaa_sig=VYTO1C7LrqKe5-wChQpAhsovZWkj-qRnV6FsRN7g_pArRBQEjT58kKccQjlVTguxuTFIDEpAYtLo6MSpzbl6dQ%3D%3D and Hanspal, J. and Harrison-Broninski, B., Land and Climate Review, 2024, Drax's pellet mills violated environmental laws 189 times in Canada, https://landclimate.org/drax-mills/

[22] Crowley, J. and Robinson, T., BBC Panorama, 2022, Drax: UK power station owner cuts down primary forests in Canada, https://www.bbc.co.uk/news/science-environment-63089348 and Crowley, J., BBC Panorama, 2024, Drax: UK power station still burning rare forest wood, https://www.bbc.co.uk/news/science-environment-68381160

[23] Kamp, M. July 9, 2021. "How marginalized communities in the South are paying the price for 'green energy' in Europe," CNN, https://www.cnn.com/interactive/2021/07/us/american-south-biomass-energy-invs/; CNN. July 9, 2021. "'It's like we don't matter': Green energy loophole has devastating impact on community," https://www.cnn.com/videos/us/2021/07/07/american-south-biomass-energy-mg-dp-nws-orig.cnn.

[24] Tukker, S. Feb. 22, 2020. US 'completely devastated the landscape' to meet our climate goals. Een Vandaag, https://eenvandaag.avrotros.nl/item/om-onze-klimaatdoelen-te-halen-wordt-in-de-vs-het-landschap-volledig-verwoest/.

[25] Montague, B. April 18, 2018. "Hardwood forests cut down to feed Drax Power plant, Channel 4 Dispatches claims." The Ecologist, https://theecologist.org/2018/apr/16/hardwood-forests-cut-down-feed-drax-power-plant-channel-4-dispatches-claims; Forests in the U.S. Cut Down and Burnt in UK Power Stations, https://www.facebook.com/watch/?v=10155880285306939.

[26] Stashwick, S. 2017. "Money to Burn II; Solar and Wind Can Reliably Supply the United Kingdom's New Electricity Needs More Cost-Effectively Than Biomass," NRDC Issue Brief, https://www.nrdc.org/sites/default/files/uk-biomass-replace-coal-clean-energy-fs.pdf

For more information on how European pellet imports are impacting forests and increasing carbon emissions, please contact:

SCOT QUARANDA
COMMUNICATIONS DIRECTOR,
DOGWOOD ALLIANCE
SCOT@DOGWOODALLIANCE.ORG

ELLY PEPPER
SENIOR ADVOCATE,
NATURAL RESOURCES DEFENSE COUNCIL
EPEPPER@NRDC.ORG

DAVID W. CARR
GENERAL COUNSEL,
SOUTHERN ENVIRONMENTAL LAW CENTER
DCARR@SELCVA.ORG