

BIOMASS MILLS IN ESTONIA AND LATVIA ARE SOURCING FROM FORESTS WITH DECLINING CARBON STOCKS

**CUT CARBON
NOT FORESTS**



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EXECUTIVE SUMMARY

New NRDC analysis shows that forests surrounding eight wood pellet mills in Estonia and Latvia are losing carbon and have been for more than a decade. These pellet mills export biomass to the UK and have strong links to Drax power station, which burns millions of tonnes of biomass every year. Despite claims from the bioenergy industry and UK Government that harvesting wood pellets can maintain or increase forest carbon, our analysis uses satellite data to show that forests surrounding all eight pellet mills showed a decline in carbon storage from 2015-2022. According to Drax's Annual Reports, it first began importing wood from Estonia and Latvia in 2015.¹

1. 2016, A reliable, renewable future, today Drax group plc Annual report and accounts 2015, <https://www.drax.com/wp-content/uploads/2016/09/2015-Annual-Report-and-Accounts-for-the-year-ended-31-December-2015.pdf>

INTRODUCTION

The United Kingdom is a major burner of woody biomass in power stations and imports hundreds of thousands of tonnes of wood pellets from Estonia and Latvia. Chief among the users of these wood pellets is Drax—a huge power station in Yorkshire that is the world’s largest producer of electricity from bioenergy. The UK’s biomass demand causes significant harm to forests in Estonia and Latvia, damaging ecosystems, harming biodiversity, and worsening climate change. Drax alone has burned tens of millions of tonnes of wood since 2012, a significant share of which comes from Estonia and Latvia.² Since 2015, Drax has sourced 2.1 million tonnes of wood from Estonia and 6.2 million tonnes of wood from Latvia, burning more than 8 million tonnes of wood from the two countries in ten years.³

Drax and the UK Government claim that burning woody biomass is low-carbon. They say the millions of tonnes of greenhouse gases released at the power station are offset by the regrowth of trees in other countries. Thus, the UK counted the approximately 13 million tonnes of carbon dioxide Drax released in 2024 as zero.⁴ The UK Government also asserts that short-term carbon losses are acceptable as long as they recover in the long-term. However, it fails to define ‘long-term’ (in fact, it’s something the UK Government has been consulting on in early 2026). The only definition we have comes from the UK’s leading biomass sustainability certification program (Sustainable Biomass Program (SBP)), which identifies ‘long-term’ as “several successive forestry rotations,”

each of at least 20 years, though possibly more than 100, depending on forest type and management practices.⁵ If we assume conservatively that “several” means ‘3 or more,’ that puts the SBP definition of ‘long-term’ as a range of 60 to more than 300 years.

This timeframe (anywhere from 60 to over 300 years) is wildly out of sync with the timelines for action needed to avoid the worst impacts of climate change. As of 2017, scientists predicted that global emissions would exceed the critical Paris Climate Agreement target of 1.5C by 2040.⁶ But by 2026, the Global Carbon Project estimated we have only about **four years** at 2025 emissions levels before we exceed this threshold.⁷ This means the climate simply doesn’t have time for even short-term carbon losses, much less losses that last for decades or centuries. This is especially true since harvesting wood for electricity has immediate-term carbon impacts - beyond millions of tonnes of emissions released at the smokestack - like the loss of the ongoing carbon uptake of logged trees, which can take years for younger replanted trees to replace.⁸

Investigations have shown that the bioenergy industry in Estonia and Latvia harms nature.⁹ This includes disturbing the nesting of rare birds like the goshawk, impacts on forests home to declining bird species such as the hazel grouse, and logging for wood pellets in what should be legally protected areas including Natura 2000 sites and Woodland Key Habitats.¹⁰

2. Drax, webpage, accessed February 2026, Results, Reports & Presentations, <https://www.drax.com/results-reports-presentations/>
3. Ibid.
4. Drax Group plc, 2025, Shaping tomorrow’s energy landscape: Drax Group plc Annual report and accounts 2024, https://www.drax.com/wp-content/uploads/2025/05/Drax_AR2024_Interactive.pdf
5. Sustainable Biomass Program, webpage, accessed February 2026, SBP Standards v2.0, <https://sbp-cert.org/documents/normative-documents/version-2/standards-v2/>
6. IPCC, 2018, Special Report: Global Warming of 1.5C: FAQ Chapter 1, <https://www.ipcc.ch/sr15/faq/faq-chapter-1/>
7. Global Carbon Budget, 2025, <https://globalcarbonbudget.org/gcb-2025/>
8. L. He, et al., 2012, Relationship between net primary productivity and forest stand age in U.S. forests, *Global Biogeochemical Cycles*, 26(3), <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2010GB003942>
9. Centre for Research on Multinational Corporations and Greenpeace Netherlands, 2021, Wood pellet damage: How Dutch government subsidies for Estonian biomass aggravate the biodiversity and climate crisis, <https://www.greenpeace.org/static/planet4-netherlands-stateless/2021/07/3eb1db79-wood-pellet-damage.pdf> and Latvian Ornithological Society and Estonian Fund for Nature, 2020, Hidden inside a wood pellet: Intensive logging impacts in Estonian and Latvian forests, https://media.voog.com/0000/0037/1265/files/Biomass_report_ENG%20_2020.pdf and
10. Ibid.

More widely - for example in the southeast United States - mills that produce wood pellets cause significant human health impacts.¹¹

We are nearing crucial tipping points for the global climate.¹² Burning forests makes climate change worse and undermines crucial carbon stores. The results of our

analysis are part of a wider trend for forests in the Global North, which are expected to become overall emitters of carbon dioxide by the second half of this century.¹³ Harvesting and burning forest biomass for energy is accelerating this loss of forest carbon stocks. Stopping the loss of forests is shown to be one of the critical actions that could reduce global warming to less than 2C.¹⁴



Hazel Grouse
Photo credit: Karl Adami

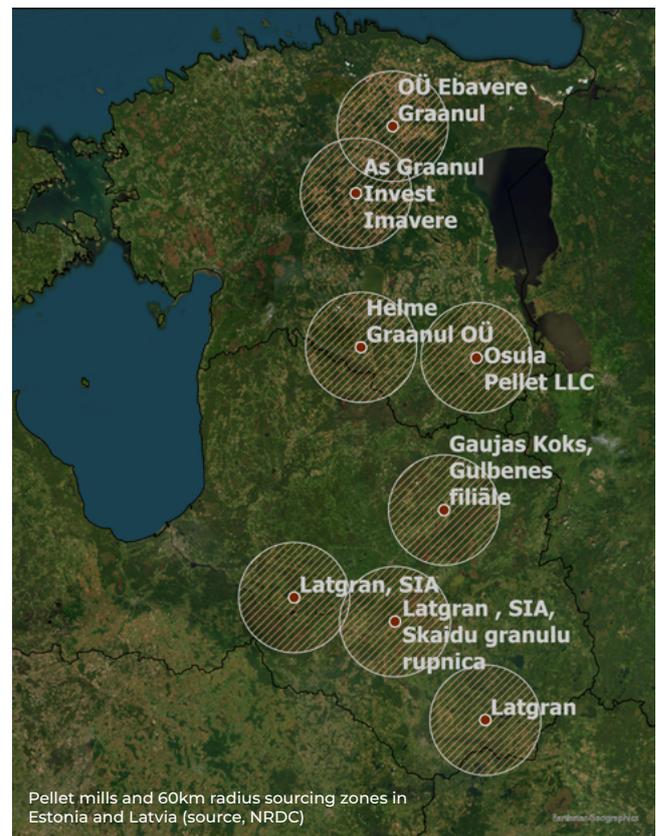
11. Southern Environmental Law Center, 2024, Groundbreaking report reveals harmful impacts of biomass wood pellet plants, <https://www.selc.org/press-release/groundbreaking-report-reveals-harmful-impacts-of-biomass-wood-pellet-plants/>
12. November 2025, The Global Tipping Points Report 2025, <https://global-tipping-points.org/>
13. AirClim, 2025, Sink or Source? Northern Forests at a Crossroads, https://www.airclim.org/sites/default/files/2025-05/sink_or_source_report_250321.pdf and Climate Analytics, 2024, Climate impacts in northern forests, <https://cal-clm.edcdn.com/publications/Climate-impacts-in-northern-forests.pdf?v=1714381265>
14. Climate Action Tracker, 2025, Three key near-term actions could bend the warming curve; bringing projected warming below 2C, https://climateactiontracker.org/documents/1353/CAT_2025-11-19_Briefing_COP30_EnergyMethaneGoals.pdf

METHODOLOGY

For this analysis, eight pellet mills were selected with close ties to the UK and/or Drax, making the supply chain between Estonia and Latvia and the UK very likely. The four mills in Estonia are owned by Graanul Invest, which Drax reports as its “long-term supplier”.¹⁵ The four mills in Latvia are owned by LatGran, a subsidiary of Graanul that lists the UK as one of its biggest export markets.¹⁶ Further details on these links can be found in Drax’s catchment area analyses for Estonia¹⁷ and Latvia¹⁸ and in Drax Group’s annual report and accounts document from 2024.¹⁹

The analysis is then based on sourcing zones of a 60 kilometer radius around each pellet mill, and evaluates changes in forested land since 2015. We selected forested lands using the 2015 land cover data from the ESA Land Cover Climate Change Initiative.²⁰ The 60 kilometer radius is derived from an approximation of the sourcing zones for timber harvest likely used by each pellet mill based on Graanul Invest’s 2020 Sustainability Report which describes their sourcing radius as 53-58km with a maximum of 70 km.²¹ To estimate carbon stock changes we used aboveground biomass data from the ESA Climate Change Initiative representing the oven-dry weight of all plant components, including the wood (stem, bark, branches, twigs and above ground roots) and foliage.²² Data are given in tonnes of carbon per hectare, and are then averaged within each sourcing zone polygon over the years of interest, and multiplied by the polygon area to estimate the total carbon stock change

in each year. The analysis compared the aboveground biomass data from 2007, 2015, and 2022. While sourcing from these areas continues through the present, 2022 is the last year data is available. This analysis does not include changes in below ground carbon (carbon stored in roots and soil) as this is more difficult to measure and data is limited, but impacts to this store of carbon would be expected to follow similar trends to above ground changes on a delayed timescale.



15. Drax Power Limited, 2020, Catchment Area Analysis in Estonia, <https://www.drax.com/wp-content/uploads/2020/03/8515-Drax-Catchment-Area-Analysis-Estonia-FINAL-REPORT-v3.pdf>
16. LatGran, webpage, accessed February 2026, <https://latgran.com/pellets/>
17. Supra note 15
18. Drax Power Limited, 2020, Catchment Area Analysis in Latvia, <https://www.drax.com/wp-content/uploads/2020/06/8618-Drax-Latvia-Catchment-Area-Analysis-FINAL-Report.pdf>
19. Supra note 4.
20. CEDA Archive, 2019, ESA Land Cover Climate Change Initiative: Global Land Cover Maps, <https://catalogue.ceda.ac.uk/uuid/b382ebe6679d44b8b0e68ea4ef4b701c/>
21. Graanul Invest, 2020, Sustainability report 2020, https://graanulinvest.com/wp-content/uploads/2021/06/graanul_invest_aruanne_2020_en_screen_spreads.pdf
22. ESA Climate Office, webpage, accessed February 2026, Biomass Data, <https://climate.esa.int/en/projects/biomass/data/>

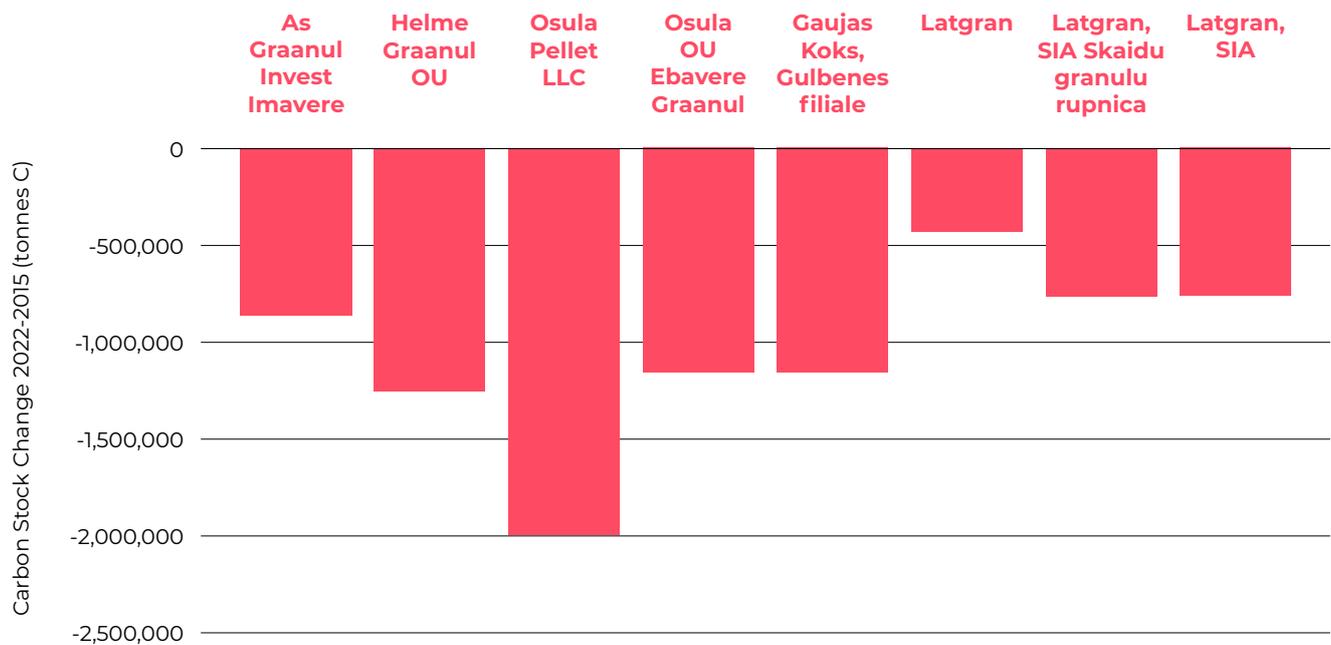
RESULTS AND DISCUSSION

Within the estimated sourcing zones (60 km radius) of all of these pellet mills, the forests have **been losing carbon** from 2015 to 2022. Comparing further back to 2007, the pattern is the same - forest carbon is declining.

Combined across all eight pellet mill sourcing regions, we see a staggering

loss of 7.9 million tonnes of carbon from these forests from 2015 through 2022.⁴ A far cry from helping reduce greenhouse gas emissions, the carbon lost from these forests is the equivalent of running an entire coal fired power plant over all seven years, or running more than 10 natural gas power plants over that time.²³

TABLE 1. Carbon losses over the period 2015 to 2022 in each of the eight pellet mill 60km sourcing zones



What do these declines tell us? Shrinking carbon stocks mean both that the forests are holding less carbon now, and that they are able to absorb less carbon than they did previously. If that carbon isn't being stored in the forest, some of it may get stored in wood products like furniture or houses, but we know much of it ends up in the atmosphere

thanks to its use in biomass power stations. This means millions of tonnes of the CO₂ produced by UK biomass power stations is not being offset but instead makes climate change worse.

²³ United States Environmental Protection Agency, webpage, accessed February 2026, Greenhouse Gas Equivalencies Calculator, <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

We see these forest losses reflected not just within the pellet mill sourcing zones, but in concerning broader national and regional trends. Data reported to the United Nations shows that, at a national level, forests in Latvia²⁴ and Estonia²⁵ have changed from carbon sinks (or absorbers of carbon) to emitters. Global Forest Watch data reveals that from 2015-2020, Latvia²⁶ lost 236,000 hectares of tree cover and Estonia²⁷ lost 195,000 hectares. The same trend of net loss of tree cover in both countries holds over the longer term, going back as far as 2000. Meanwhile the amount of carbon absorbed by lands across Europe as a whole since 2010 has fallen by one third²⁸, and the European Scientific Advisory Board on Climate Change has identified bioenergy as a major driver of declining European forest carbon stocks.²⁹

Unfortunately, supporters of biomass seem to view these losses as acceptable. For example, one of the world's leading biomass certification schemes – SBP – still rates Estonian and Latvian biomass as low risk for sustainability breaches, despite

acknowledging that Estonia's forest carbon stocks have declined in recent years (and data now show that the country's forests are overall emitters).³⁰ The climate can't afford to continue to wait and see if these losses are eventually deemed unsustainable; 15 years of decline is already far more than the UK government should accept.

Concerning impacts from biomass production have been also documented in other regions from which the UK imports wood pellets. In the southeastern United States, analysis found a net loss of forested area within wood pellet mill sourcing zones.³¹ U.S. Environmental Protection Agency (EPA) data also shows that forest carbon sinks across the United States as a whole – particularly in southeastern states – have been shrinking.³² Beyond the industry's impacts to carbon, pellet mills cause extensive health and quality of life impacts to local communities – predominantly impoverished communities of color – due to air and noise pollution.³³

24. UNFCCC, Latvia Common Reporting Tables 2025, <https://unfccc.int/documents/646437>
25. UNFCCC, Estonia Common Reporting Tables 2025, <https://unfccc.int/documents/646498>

26. Global Forest Watch, Latvia, <https://tinyurl.com/m52hxuus>

27. Global Forest Watch, Estonia, <https://tinyurl.com/573rp3uu>

28. Greenfield, P., Guardian, 2026, Germany's dying forests are losing their ability to absorb CO2. Can a new way of planting save them?, <https://www.theguardian.com/environment/2026/jan/08/germany-forests-bark-beetle-spruce-co2-carbon-sink-monoculture-aoe>

29. European Scientific Advisory Board on Climate Change, 2024, Towards EU climate neutrality: progress, policy gaps and opportunities, <https://climate-advisory-board.europa.eu/reports-and-publications/towards-eu-climate-neutrality-progress-policy-gaps-and-opportunities>

30. Sustainable Biomass Program, 2024, Revised Regional Risk Assessment for Estonia, <https://sbp-cert.org/documents/consultation-documents/archive/revise-rra-estonia/> and EU Bioenergy, 2025, From Earth's green lungs to grey smokestacks: how European forests became carbon emitters, <https://www.eubioenergy.com/2025/03/21/from-earths-green-lungs-to-grey-smokestacks-how-european-forests-became-carbon-emitters/>

31. Williams, C., and Xi L., prepared for Southern Environmental Law Center, 2021, Forest Clearing Rates in the Sourcing Region for Enviva Pellet Mills in Virginia and North Carolina, U.S.A., <https://southernenvironment.sharefile.com/share/view/s322e5dc731984235ab391a16115a7d21> and Southern Environmental Law Center, 2023, Satellite images show link between wood pellet demand and increased hardwood forest harvesting, <https://www.selc.org/wp-content/uploads/2022/03/Biomass-White-Page.pdf>

32. United States Environmental Protection Agency, webpage, State GHG Emissions and Removals, <https://www.epa.gov/ghgemissions/state-ghg-emissions-and-removals>

33. Supra note 11

CONCLUSION

These various lines of evidence call into question how any standards can ensure that forest-derived biomass is truly sustainable. While it may seem like a tempting electricity option with its lofty promises of net zero (or even net negative) emissions, the reality is that it's actually a carbon intensive energy source that is worsening climate change despite existing sustainability requirements. In other words, despite extensive current sustainability standards, burning woody biomass threatens biodiversity, increases levels of toxic air pollutants, and emits massive amounts of carbon into the atmosphere at the smokestack while forest cover is shrinking and forest carbon stocks are declining in the harvest regions. It is unacceptable for supposed low-carbon technologies to increase emissions in the short-term based on future emissions savings that might only materialise decades from now, if ever.³⁴

Forests in Estonia and Latvia near wood pellet mills are losing their carbon stocks. They have been consistently losing them for years. Even forests in the wider landscape, across Estonia and Latvia as a whole, are storing less carbon, so they cannot be used to "offset" carbon losses from wood pellet harvesting. The UK must stop labelling biomass from Estonia and Latvia as sustainable and stop burning it. The UK can achieve net zero³⁵ and produce enough electricity without burning biomass.³⁶

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Also supported by



34. IISD, 2018, EASAC Warns Against Classifying Forest Biomass as Renewable, Carbon Neutral, <https://sdg.iisd.org/news/easac-warns-against-classifying-forest-biomass-as-renewable-carbon-neutral/>
35. WWF, RSPB, 2023, Beyond BECCS: The Case for a Reduced Reliance on Bioenergy Carbon Capture and Storage in Meeting Net Zero, <https://www.wwf.org.uk/sites/default/files/2023-12/WWF-RSPB-BECCS-Report.pdf>
36. E3G, 2025, The UK's clean power mission: Delivering the prize, <https://www.e3g.org/publications/the-uks-clean-power-mission-delivering-the-prize/>