



## BIOMASS AND ENVIVA Unintended Consequences in Carbon Accounting

### Executive Summary

In response to climate change, many countries, especially in Europe, have turned to biomass as a source of green, zero-carbon energy. Biomass is technically a form of renewable energy with no carbon footprint because the carbon released by burning wood had been removed from the atmosphere at an earlier time by the trees and will be sequestered again when trees grow back over time. In the past, when biomass energy was a small industry, the wood pellets were made of collected forest debris, which served to protect forests from wildfires. Now, as demand has grown, pellets are being made out of whole trees at a much larger scale, causing deforestation and environmental degradation. Due to the system of accounting for CO<sub>2</sub> laid out in the [Kyoto Protocol](#) and the Paris agreement, the CO<sub>2</sub> that is released when biomass is burned is not counted towards a country's overall CO<sub>2</sub> emissions level. Utility companies in the UK and elsewhere have capitalized on this loophole and pushed biomass as a solution to meeting emissions targets by converting coal plants to burn wood pellets sourced from the US.

However, there is a growing scientific consensus that biomass is not a carbon-neutral source of renewable energy. It is contributing to deforestation in the Southern US. Considering the entire life-cycle of pellet production, from drying (often green) wood to shipping the pellets to the EU and Asia on diesel-powered ships; swapping out coal for wood pellets actually increases CO<sub>2</sub> emissions [by as much as 50%](#). Biomass at the smokestack alone emits 2% more CO<sub>2</sub> than coal on a per/kWh basis and burning biomass also releases high levels of harmful volatile organic compounds (VOCs).

The concern remains that this is nothing more than a governmental and industrial sleight of hand that allows harmful pollution and high levels of CO<sub>2</sub> into the atmosphere under the guise of renewable energy. As demand in Europe has grown, U.S. companies are scaling to meet demand to produce pellets for export using Southern forests. The biggest such company is Enviva, LLC, which positions itself as an environmentally-friendly business, despite misleading and unscientific marketing, links to deforestation, and high levels of harmful pollution.

### Biomass and CO<sub>2</sub>

Biomass in the form of wood pellets is less energy dense than fossil fuels, which leads to higher levels of CO<sub>2</sub> per unit burned on a kWh to kWh basis. According to [a report](#) by The Royal Institute for Policy Affairs, CO<sub>2</sub> emissions from biomass are significantly higher than emissions for coal and double the level of emissions for natural gas. A [study](#) by the National Resources Defense Council found that, if companies such as Enviva continue to use Southern hardwood trees in their pellet production, it would take 50 years for the CO<sub>2</sub> being produced by pellet-burning to be re-sequestered by forests and make the process carbon-neutral. Another [recent study](#) published in Environmental Research Letters examined the Net Emissions Impact (NEI) of biomass production, which compares the total emissions over time caused by burning biomass to the emissions if the wood is simply allowed to decompose. Even assuming a high rate of decomposition, the NEI for the current biomass market is 55%, meaning that biomass releases far more CO<sub>2</sub> over time than natural processes.

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The carbon-neutrality of biomass depends heavily on where the wood itself comes from, which is why companies such as Enviva [stress heavily](#) that they rely on residues and unused wood rather than whole trees. However, this is highly unlikely. The U.S. Forest Service [has stated](#) that the current level of pellet production in the U.S. requires the use of whole trees rather than just residues and that the problem of deforestation will only increase as demand rises. By removing large carbon sinks to produce pellets, companies remove the possibility of sequestration and increase the amount of time it will take for biomass burning to become carbon neutral.

### The Kyoto Protocol and Biomass

The [accounting principles](#) of the Kyoto Protocol counted biomass used for energy production under the umbrella of Land Use, Land-Use Change, and Forestry (LULUCF), rather than under the umbrella of energy. The LULUCF has now become the Agriculture, Forestry, and Other Land-Use (AFOL) sector, where biomass remains. [A report](#) in *Energy Policy* explains that biomass emissions are supposed to be recorded when the trees or other biomass is harvested, preventing double-counting that would arise by measuring the carbon emissions of deforestation *and* the carbon released when burning. However, when countries not covered by the Kyoto Protocol (such as the US) ship pellets to Protocol Signatory countries (such as the UK), the carbon [is never accounted for](#) because the US does not measure the carbon release caused by deforestation and the EU Kyoto-based emissions guidelines assume that the carbon has already been accounted for.

The EU Emissions Trading System only deals with forms of production considered 'energy' under the Kyoto principles and does not deal with the land use sector, where biomass is categorized. Transport and Environment, BirdLife Europe, and the European Environmental Bureau, three European NGOs, [have called](#) for the end of the treating biomass as a zero-emission form of energy due to the rise in biomass use across the continent. The use of biomass in Europe is currently heavily subsidized and the demand is quickly outpacing the amount of sustainable biomass available, making countries highly dependent on imports.

### Other Impacts of Biomass

The Southern Environmental Law Center (SELC) [has stated](#) that the increased logging of hardwood forests threatens vulnerable species and biodiversity hotspots, as forests are converted to pine plantations to fuel wood pellet production and already-depleted bottomland hardwood forests are clear-cut. Other than high levels of CO2 emissions, the production of biomass releases high levels of harmful pollution. [Research](#) by the Partnership for Public Integrity found that U.S. biomass producers emit twice as much particulate matter and six times as much VOCs as coal plants. Many plants circumvent Clean Air Act regulations to produce dangerous levels of pollution with little to no oversight or consequences.

### Enviva

Enviva is the largest producer of wood pellets for biomass energy in the United States, currently operating at about 3 million metric tons of pellets per year. The Partnership for Public Integrity (PFPI) recently filed [a report](#) against the company, claiming, among other things, that Enviva's advertising is

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misleading about the renewable nature of biomass and the actual makeup of the wood used to produce pellets. According to PFPI, up to 50% of Enviva's raw material is from hardwood forests, the same southern forests that the SELC is concerned about. Enviva's advertising downplays their use of whole trees in manufacturing and emphasizes their use of forest residues and unusable 'waste' material.

The PFPI report also explains that Enviva's assertions of carbon-neutrality are based on EU's flawed accounting principle that fails to record the CO<sub>2</sub> produced by burning biomass and assumes a perfect rate of forest regrowth, which is especially unrealistic for Southern hardwood forest ecosystems where trees can be up to 100 years old.

[The Dogwood Alliance](#), a nonprofit based in North Carolina (a state with three Enviva plants) has been trying to expose evidence of Enviva using whole trees and has published several [photos](#) that track trees from clear-cuts to Enviva processing plants. [According to Dogwood](#), 81% of Enviva's sourcing comes from standing forests, some of which are fragile wetlands. The Alliance has been fighting Enviva's continued expansion in the South, especially in low-income environmental justice communities, [which are](#) 50% more likely to have a biomass facility.

The Environmental Integrity Project has gone after Enviva in [their report](#) on how biomass manufacturers skirt the Clean Air Act, accusing Enviva of being "the dirtiest in the industry." Their investigation found several documented cases of high pollution and highlighted a general trend of air quality violations and a lack of oversight. The company routinely refuses to install appropriate abatement technology, leading to two North Carolina Enviva plants having VOC emissions levels that are six times higher than other local biomass production centers. Many Enviva plants are permitted as 'minor' sources of pollutants, which exempts the company from implementing new technologies for abatement. Enviva Northampton produces 600,000 tons of pellets per year and emits 377 tons of VOCs, but is considered a minor source of pollution due to lax oversight by the state of North Carolina, while Enviva Cottondale emits nearly 500 tons of VOCs but is still not required to equip the industry standard of technology. At Enviva Southampton, the company removed control technology and switched to producing less-VOC-heavy hardwoods, releasing more CO<sub>2</sub> and ramping up the threat to endangered forests.

Overall, Enviva is [rapidly growing](#) to meet demand, opening new plants and ramping up production. [Our Children's Earth](#) is working on litigation to stop the expansion and building of new processing plants in the southeast.

### **Conclusion**

If nothing is done to stop the conversion of coal-powered energy to biomass we may look back in 15 years and wonder why we cut down our forests in order to burn wood for energy production with increased carbon emissions that nevertheless enabled us to meet our Paris goals. We have a very brief time horizon to get this right and it will take a coalition of grassroots activists, litigation, possible SEC filings, and we are not sure what else. We welcome your input and discussion of best next steps.