RACHEL CARSON COUNCIL

Carbon Debt and Biomass

Factsheet

Burning wood pellets releases carbon immediately, while regrowing forests take decades to centuries to reabsorb that carbon, creating what scientists call carbon debt. This debt persists long after pellets are burned, meaning biomass increases atmospheric CO_2 precisely during the years when rapid reductions are most critical. Due to their low energy density, high moisture content, and additional upstream emissions, burning wood pellets emits more carbon per unit of electricity than coal, yet they are still labeled as "renewable" under outdated federal and international policies.

Key Facts

Carbon Emissions

Compared with the average coal-burning power plant, biomass-burning power plants emit 150% the carbon dioxide and 300-400% the carbon dioxide of natural gas per unit of energy produced.[1]

Regeneration

After clear-cutting, it would take between 44 and 104 years to repay the carbon debt, even if the trees were replanted.[2]

Carbon Storage

Forests play a key role in storing carbon, accounting for 92% of terrestrial biomass globally and storing approximately 400 gigatons of carbon.[3]

Actions for Policymakers

- Direct EPA and DOE to include carbon debt and foregone sequestration in all biomass-related emissions assessments.
- Remove biomass eligibility from the Renewable Electricity Production Tax Credit and other federal subsidies.
- Require U.S. agencies and utilities to report the actual combustion emissions from pellets, not theoretical regrowth-based offsets.
- Encourage federal oversight hearings on biomass climate impacts.

Our Recommendation

Congress should require the federal government to adopt science-based carbon accounting that includes full lifecycle emissions for biomass and removes woody biomass from any federal climate or "renewable energy" classification unless it demonstrates immediate, verifiable emissions reductions.

Results

Taking these actions would: Accurately account for emissions from biomass and prevent misleading “carbon neutral” claims; Reduce CO_2 levels by avoiding energy sources with high front-loaded emissions; Support climate policies aligned with IPCC findings; And redirect federal funding toward truly zero-carbon solutions that reduce emissions immediately.

Footnotes

1. Partnership for Policy Integrity, “Carbon Emissions,” Partnership for Policy Integrity (PFPI), accessed December 4, 2025, https://www.pfpi.net/carbon-emissions/.
2. Rachel Carson Council, Drax: Destroyer of Forests (Rachel Carson Council, 2025).
3. U.S. Department of Agriculture, “Considering Forest and Grassland Carbon in Land Management,” June 2017. https://www.fs.usda. gov/sites/default/files/fs_media/fs_document/wo-95-consideringforestandgrasslandcarboninlandmanagement-508-92517.pdf