Wood Fibers

Chemical and Environmental Justice Impacts in the Wood Fiber Life Cycle

Many AEC professionals may not be aware that the building products they specify can have environmental justice impacts.

Product manufacturing often involves the use and release of toxic chemicals throughout the supply chain, impacting human and environmental health and contributing to environmental injustice.

As built environment practitioners seek to reduce the environmental justice harms caused by their material selections, understanding the role that wood fibers play can help raise awareness of potential impacts.

WHAT IS ENVIRONMENTAL JUSTICE?

The Environmental Justice Health Alliance for Chemical Policy Reform (EJHA) defines environmental justice (EJ) as a set of principles and a grassroots-led movement that "arose in response to the disproportionate exposure of communities of color and low-income communities to harmful pollution, toxic sites and facilities, and other health and environmental hazards."[1]

Read more about the **Principles of Environmental Justice**.

This study explored the chemical and environmental justice impacts of wood fibers manufactured in the United States.

You may be familiar with building products that use wood fibers, such as composite wood; cabinetry and doors; engineered or solid wood siding and flooring; and wood fiber insulation.[2] While biological materials including wood fibers often pose fewer hazards across their life cycle than synthetic materials, it is important to consider how they compare to alternatives and the potential to further reduce any health impacts.

Habitable assessed the chemical hazard and environmental justice impacts of wood fibers according to five criteria:

1 **avoid hazardous chemicals**
2 **prevent accidents**
3 **prevent pollution and waste**
4 **abide by environmental regulations**
5 **prevent disproportionate and cumulative impacts.**

Habitable's analysis focused on the production of wood fibers that may be used in siding, flooring, or insulation: wood chips or fibers intentionally generated from logs, scrap from wood processing, and wood veneers. Facilities that perform this manufacturing include lumber mills, sawmills, plywood mills, and veneer mills.

Hundreds of facilities produce wood fibers in the U.S. Our analysis focused on 45 facilities in a variety of locations. These included all facilities identified as sawmills or plywood/veneer mills for the two largest sawmill companies in the United States, as well as three smaller companies that have some connection to insulation, flooring, or cladding.[3–10] This research was conducted in 2024.

Key Findings:

- Wood fibers are derived from a biological material.
- We identified numerous incidents—combustible dust fires and explosions—related to wood fiber manufacturing.
- Wood fiber production facilities do not generate any wood fiber-related hazardous chemical waste.
- Of the wood fiber facilities considered, a few have a history of noncompliance with U.S. Environmental Protection Agency (EPA) regulations, with one facility in significant violation for all of the previous 12 quarters.
- The combined communities surrounding the wood fiber manufacturing facilities considered have a higher percentage of Black and low-income populations than the U.S. overall.

Learn more about Habitable's research process in our Chemical and Environmental Justice Impacts Methodology.

CRITERIA FOR CHEMICAL AND ENVIRONMENTAL JUSTICE IMPACTS	FINDINGS ON WOOD FIBERS
Avoid hazardous chemicals	The input is a biological material. No hazardous, highly reactive or flammable, or volatile chemicals were identified as inputs in the wood fiber production process. Wood dust, which may be thought of as a by-product of wood fiber manufacturing, is hazardous. It is an occupational carcinogen when inhaled. Wood fibers themselves are not considered hazardous.
Prevent accidents	Incidents at facilities in the wood fiber manufacturing supply chain have resulted in fires and injured workers.[11]
Prevent pollution and waste	Facilities manufacturing wood fibers in the United States generate no hazardous wood fiber–related chemical waste.
Abide by environmental regulations	9% of wood fiber facilities researched had significant violations of EPA regulations within the previous 12 quarters. 2% of facilities (1 total) had significant violations in every quarter.
Prevent disproportionate and cumulative impacts	Compared with the United States overall, the combined communities surrounding the wood fiber manufacturing facilities researched have a: • lower percentage of people of color (33% near wood fiber facilities versus 40% in the U.S. overall) • higher percentage of low-income households (40% versus 30%) • a lower percentage of limited English–speaking households (1% versus 5%) • similar percentage of children as the nation overall (22%) While the overall percentage of people of color living near the researched wood fiber facilities is less than the nation overall, the specific racial composition of the combined communities reveals a significant disparity: Black residents make up 19% of these communities, compared to 12% in the U.S. overall. We further found cumulative impacts: • Some cities with wood fiber manufacturing facilities contain no industrial sites that release and/or manage hazardous chemicals; whereas, other cities contain many other industrial sites–up to 28 in one instance. • One city that we researched contains more than 20 other industrial sites. • In 2022, each individual city experienced collective releases of hazardous chemicals ranging from 3 pounds in one location to 2.6 million pounds in another.

Research Details

EPA reports violations quarterly. Compliance data for wood fiber facilities is from July 2024.

TRI analysis was based on data through the 2022 reporting year. Average annual releases and waste represent the most recent five years for which data was available at the time of the research (2018–2022).

Habitable used EJScreen version 2.3, including U.S. Census Bureau American Community Survey data for 2018–2022.

Sources specific to wood fiber are included to the right and in the accompanying spreadsheet. See Habitable's Chemical and Environmental Justice Impacts Methodology for other sources used in our analysis.

Sources

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