



Facts You Should Know About Cellulose and Wood Fiber Insulation Carbon Statements

A Practical Fact Sheet for Construction Professionals

Performance Claims: Separating Fact from Fiction

Cellulose and wood fiber insulation products are typically marketed with claims like:

- *Unlike other insulation materials, cellulose is the only product that actually reduces global warming potential — making it the responsible choice for climate-conscious builders.*
- *Made from 85% recycled paper, cellulose insulation is carbon-negative — meaning it stores more carbon than is emitted during its production.*
- *Wood fiber insulation tackles climate change by capturing biogenic carbon and locking it into the building for its entire lifespan — turning your walls into a carbon sink.*

At best, these claims are exaggerated¹; at worst they are misleading and violate the rules² that govern carbon accounting for insulation materials. Cellulose and wood fiber insulation are low embodied carbon products but are not carbon negative on a cradle-to-grave basis. That is, the biogenic carbon in these insulation products is stored during its service life but typically released when landfilled at the end of life. Nor are these the only insulation products with low global warming potential. Fiberglass and mineral wool insulation also have low embodied carbon that is quickly paid for through operational carbon reductions. In fact, all insulation products reduce operational carbon by lowering heating and cooling demand.

Temporary Storage Is Not Permanent Sequestration

Carbon in cellulose and wood fiber insulation is stored only during the useful life of the product. As long as the insulation remains dry, intact, and undisturbed, carbon may be stored for decades — but this storage is temporary, not permanent.

End-of-Life Emissions Are Often Ignored

At demolition, cellulose and wood fiber insulation are commonly landfilled. Under anaerobic landfill conditions, these materials may generate methane, a potent greenhouse gas. Ignoring this phase results in incomplete cradle-to-grave accounting.

All Insulation Products Reduce Building Energy Use

Insulation is unique among building materials because its primary purpose is to reduce energy use over the life of a building. Independent analysis by ICF³ shows that embodied carbon varies among insulation materials, with cellulose loose-fill and both fiberglass loose-fill and batt insulation among the lowest embodied carbon options for cavity applications. This analysis further found that the average carbon payback period for fiberglass and mineral wool insulation in residential and commercial buildings is generally under one year, after which insulation continues to deliver emissions reductions for the life of the building.

1. International Organization for Standardization. ISO 14044: Environmental Management — Life Cycle Assessment — Requirements and Guidelines. Geneva: ISO, 2006 (amended 2017, 2020). <https://www.iso.org/standard/38498.html>

2. Federal Trade Commission. Guides for the Use of Environmental Marketing Claims ("Green Guides"), 16 CFR Part 260. Revised October 2012. <https://www.ftc.gov/sites/default/files/attachments/press-releases/ftc-issues-revised-green-guides/greenguides.pdf>

3. "Carbon Payback Scenario Analysis," ICF, Report Commissioned by NAIMA, October 2024. <https://insulationinstitute.org/wp-content/uploads/2024/10/102224-NAIMA-Carbon-Payback-Period-Analysis.pdf>



Know Your Terms

Biogenic carbon: Carbon absorbed from the atmosphere by living organisms and stored in bio-based materials like wood or cellulose.

Embodied vs. operational carbon: Embodied carbon covers emissions from a material's manufacturing, transport, and disposal; operational carbon covers emissions from a building's energy use.

Cradle-to-grave vs. cradle-to-cradle: Cradle-to-grave tracks environmental impact from raw material extraction through disposal; cradle-to-gate only takes into account the raw material extraction, manufacturing, and transport to the factory "gate" and not the entire lifetime impact of the product.

Global Warming Potential (GWP): A standardized measure of climate impact from greenhouse gas emissions expressed in kg CO₂ equivalent.

Environmental Product Declaration (EPD): A verified report of a product's GWP and other environmental impacts.

Product Category Rules (PCRs): Standardized rules governing how EPDs are calculated within a product category, ensuring consistency and comparability.

What's the Risk of Buying Into Overstated Claims?

Risk: Overreliance on Biogenic Carbon

△ Marketing material may highlight carbon stored in plant-based materials while omitting potentially significant emissions at end of life, creating selective accounting and overlooking more durable, cost-effective, and impactful carbon reduction measures.

Risk: Distorting Decarbonization Priorities

△ Focusing narrowly on embodied carbon claims can distract from the most effective decarbonization strategy: adding sufficient insulation and proper air sealing to reduce operational energy use.

Risk: Sacrificing Other Important Performance Characteristics of Insulation

△ All insulation materials achieve significant lifetime carbon reductions over the life of the building. In addition, products like mineral wool insulation offer superior fire protection which may be an elevated consideration for certain building types.

How Can You Verify That the Claims Are Real?

Before accepting carbon claims from insulation manufacturers, ask:

- Does the EPD show net positive or negative GWP?
- Is the claim based on cradle-to-gate or cradle-to-grave analysis?
- Are end-of-life scenarios included (reuse, recycling, landfill)? Does it use the U.S. EPA's WARM model for calculating end-of-life carbon emissions or "industry assumptions"?
- How is biogenic carbon treated and over what time horizon?

Quick "Jobsite Checklist"

Before accepting product claims as fact, ask for the following:

- ✓ A current EPD with declared lifecycle stages that include "end of life"
- ✓ A clear explanation of biogenic carbon assumptions and sources
- ✓ Documentation of end-of-life treatment as required by Product Category Rules

Watch for Red Flags

- ❗ "Biogenic" used as a synonym for promising negative emissions
- ❗ "Carbon-negative" claims without cradle-to-grave accounting
- ❗ Embodied carbon presented as the only relevant metric
- ❗ Claims that only plant-based insulation supports low-carbon construction
- ❗ Assertions of recyclability without existing recycling infrastructure