



hempitecture[®]

Truly Sustainable Materials

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Who we are



Hempitecture develops, manufactures, and distributes *truly sustainable* building materials.

Including our flagship product: **HempWool® insulation.**

A registered **Public Benefit Corporation**

“A public benefit corporation is a corporation created to generate social and public good, and to operate in a responsible and sustainable manner.” - Cornell Law School



Where we started



Biocomposite Thermal Envelopes

US pioneer of this European building system.

1st Commercial “Hempcrete” build in US.

20+ projects completed to date.

No longer building with Hempcrete but can provide the materials for these projects



Where we're at



Fiber Composite Insulation

1:1 Conventional insulation replacement.

Development of US raw materials supply and domestic manufacturing line

Research and development of future products and offerings



U.S. Facility Development



This facility is powered by 100% Renewable Energy Resources and is capable of producing over 20m sqft of **HempWool**/year.

This factory is blueprint that can be replicated regionally in hemp growing communities across the United States.







Climate Action & Buildings



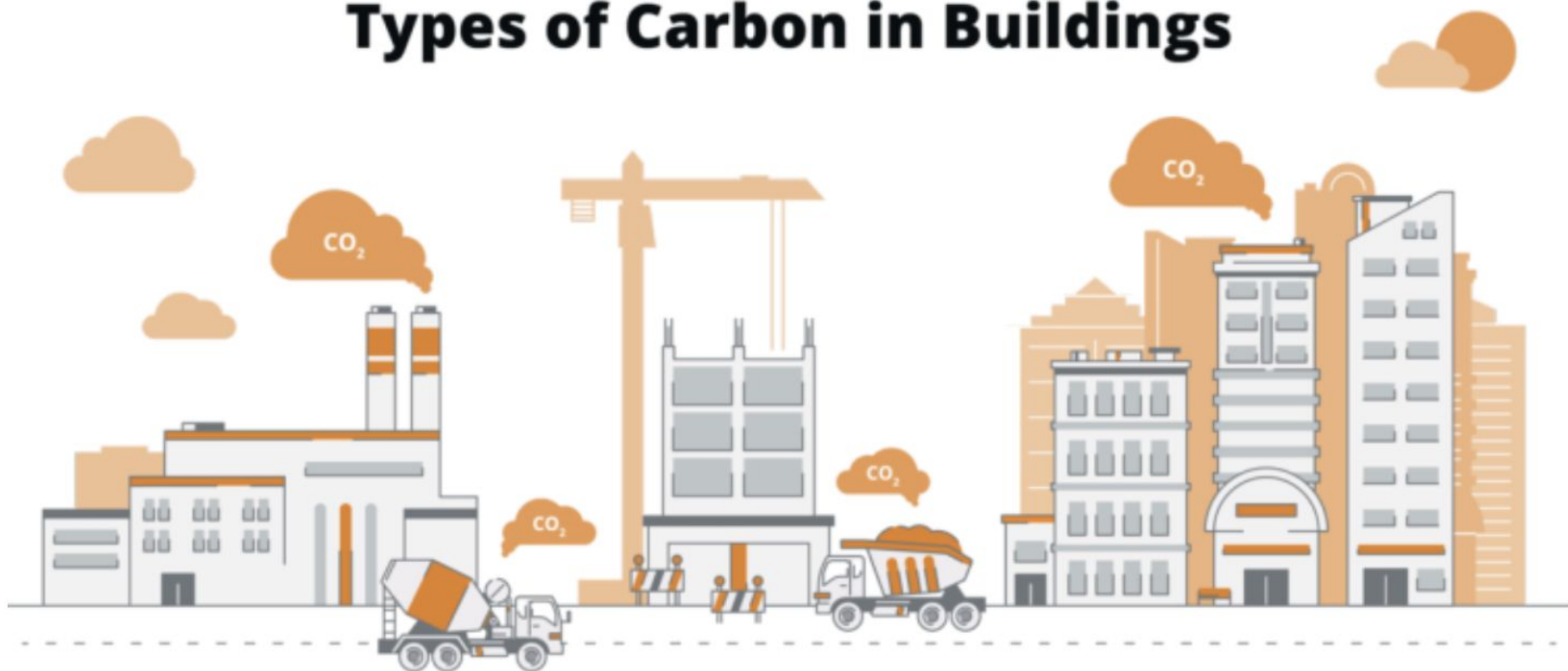
The Problem:

The Building Sector has some issues...

- Emits 40% of greenhouse gas emissions.
- **Embodied Carbon** - Building materials require enormous amounts of energy to produce, transport and install.
- *Health impacts on people and the planet - outdoor air pollution & Indoor Air Quality*

Our future deserves better & healthier options!

Types of Carbon in Buildings



Embodied Carbon

The emissions from manufacturing, transportation, and installation of building materials.

Operational Carbon

The emissions from a building's energy consumption.

Climate Action & Buildings

Leadership: Net Zero Carbon Buildings Commitment (businesses & organisations)

By 2030, **existing buildings** reduce energy consumption and eliminate emissions from energy and refrigerants.

By 2030, **new developments and major renovations** to also achieve maximum reduction in embodied carbon.

Where necessary, compensate for residual emissions.

2030

Mainstream: All buildings globally

By 2030, **all new buildings, infrastructure and renovations** will have at least 40% less embodied carbon with significant upfront carbon reduction.

All new buildings must be **net zero operational carbon**.

1. Reduce and optimise energy demand



2. Generate balance from renewables



3. Compensate for residual emissions



4. Plan for deep decarbonisation



OPERATIONAL CARBON

Advancing Net Zero Whole Life Carbon

EMBODIED CARBON

1. Prevent

2. Reduce and optimise

3. Plan for the future

4. Compensate for residual emission

Advocate through business activities for **all buildings to be net zero whole life carbon** by 2050.

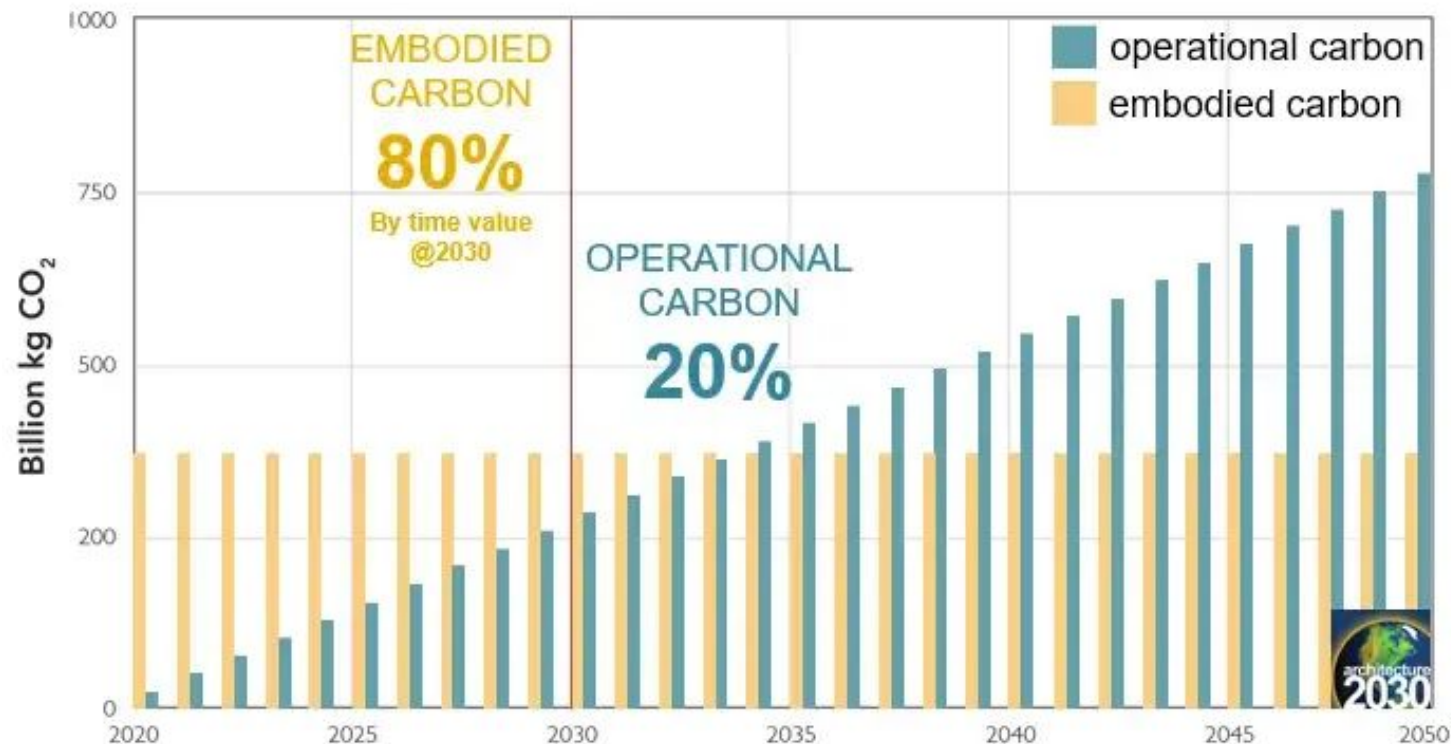
2050

By 2050, **all new buildings, infrastructure and renovations** will have **net zero embodied carbon**,

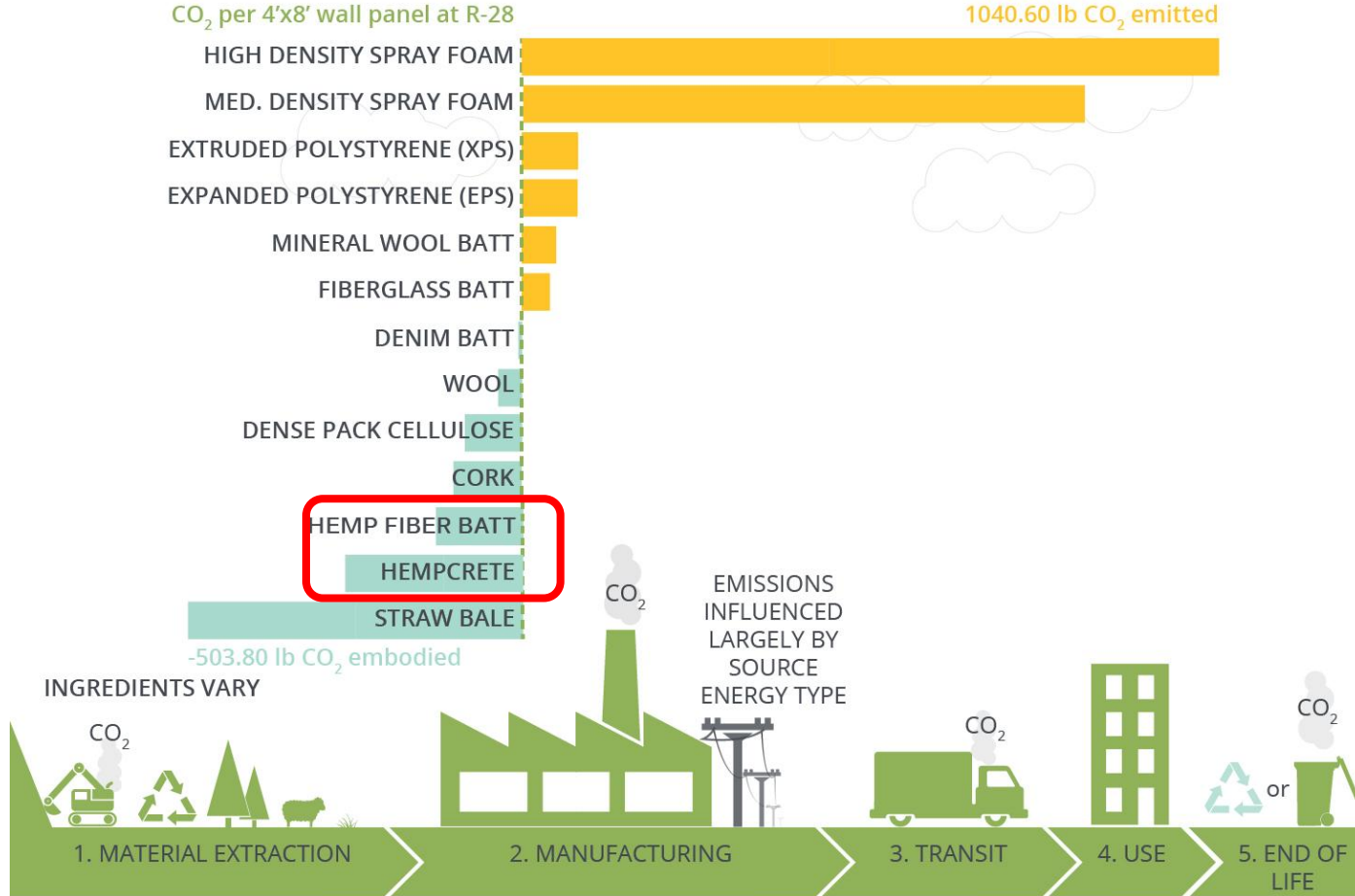
All buildings, including existing buildings must be **net zero operational carbon**.

Climate Action & Buildings

Total Carbon Emissions of **All Global New Construction**
from 2020-2050
Business as Usual Projection



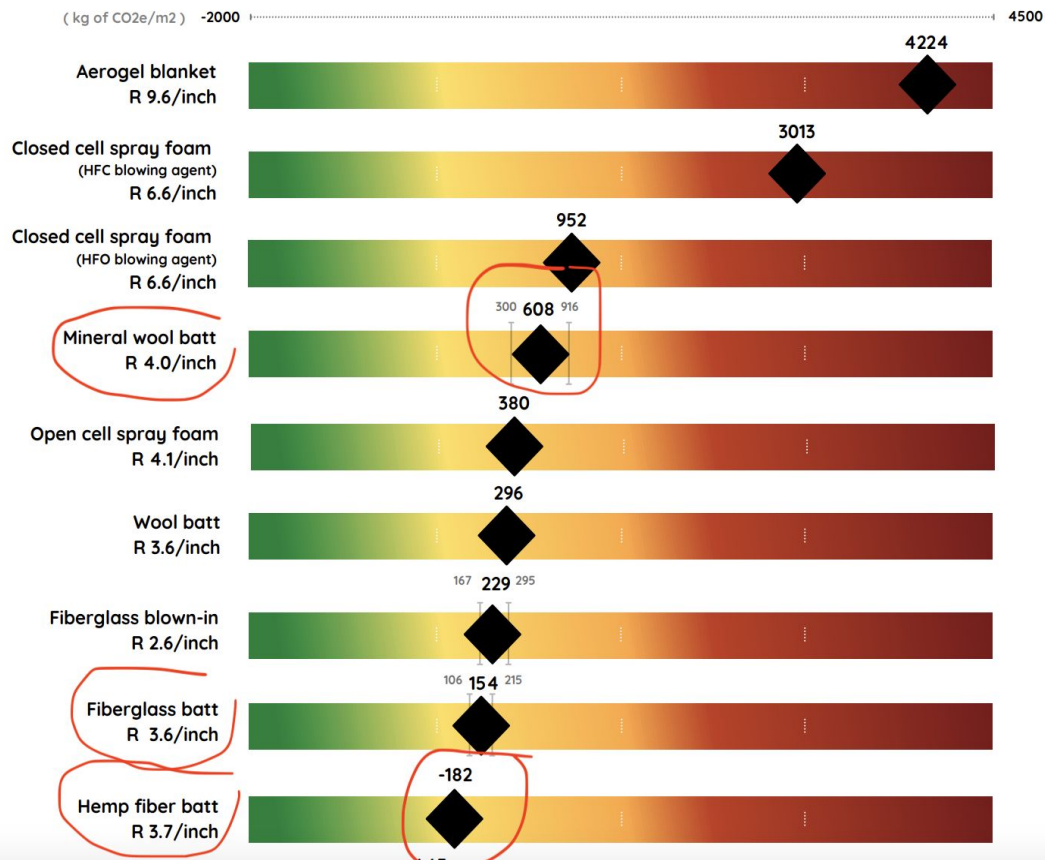
Carbon Impact of our Materials



Why Hemp?

Wall Cavity & Attic Insulation

insulation emissions based on 100 m² (at R-13)



The AEC community is now evaluating the broader impacts materials have on our environment:

- Although recognized as a more “sustainable” material, mineral wool takes a large amount of resources (i.e, extraction and heat energy) to manufacture.
- The embodied carbon impact of MW is significantly higher than other insulation
- **Bio-based materials sequester carbon & can have a negative carbon footprint**

The Solution:

U.S. grown and manufactured, plant-based building materials that address both embodied energy (carbon) and operational energy (carbon).



While at the same time...

- Creates local manufacturing & agriculture jobs
- Shortens supply chains
- Cleans the soil, air & water

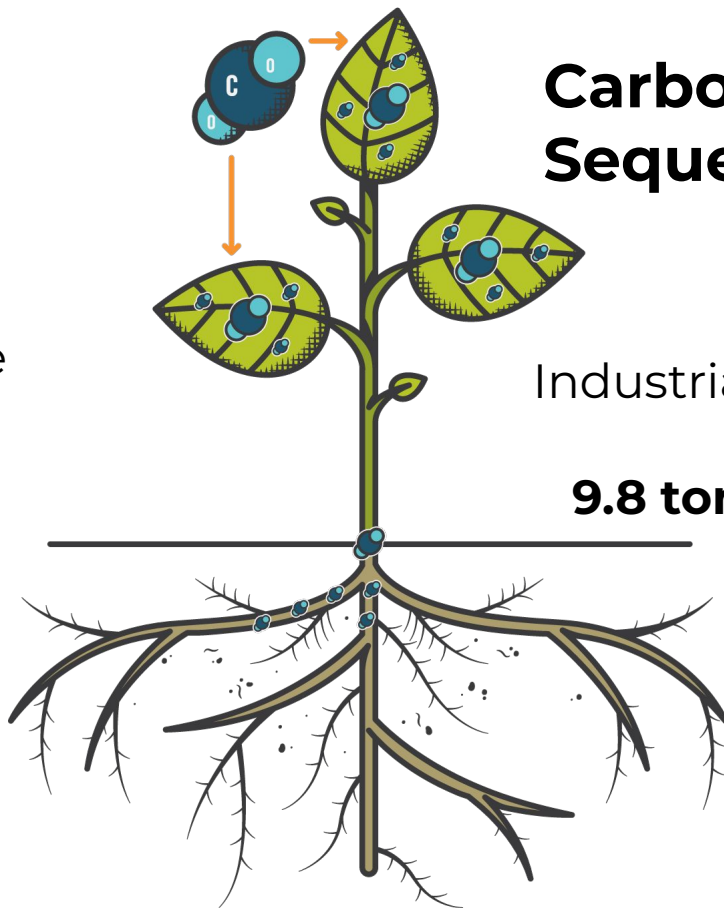


Why Hemp?

Why Hemp?

Biomass fibers from rapidly-renewable industrial hemp is our key ingredient.

- High yield/acre
- Low fertilizer & water use
- Inexpensive & abundant natural fiber
- Regenerative to soil
- Multiple value add-products
- Suited to American farming climate



Carbon Sequestration

Industrial Hemp Offsets
up to
9.8 tons of CO₂ / acre
(Or approx.
2+ cars'
emissions)

Meet HempWool®

A healthy, natural fiber batt insulation that contributes to high performing, energy efficient habitats. Made from 90% industrial hemp fiber, HempWool has a low carbon footprint, is safe to handle, and is extremely durable. Installing HempWool is simple, making it even easier to choose health and high performance for your next project.



HEALTHY
BUILDING
MATERIALS
FOR
PEOPLE
& PLANET

Why HempWool?



NO VOC's. NO TOXINS.

Your healthy home starts right here with HempWool®. Insulation is one of the last things on your mind when building your home, and this leads to unhealthy, toxic materials being snuck into your walls. Be proactive and don't settle for the competitors, get the healthiest insulation money can buy.



SAFE TO TOUCH

If you wouldn't touch a product with your hands, why would you cover all of your home with it? HempWool is 90% hemp fiber and 10% binder. Due to its simple composition and non-toxic additives, it is safe to touch and handle without gloves, while giving you peace of mind.



BETTER PERFORMANCE

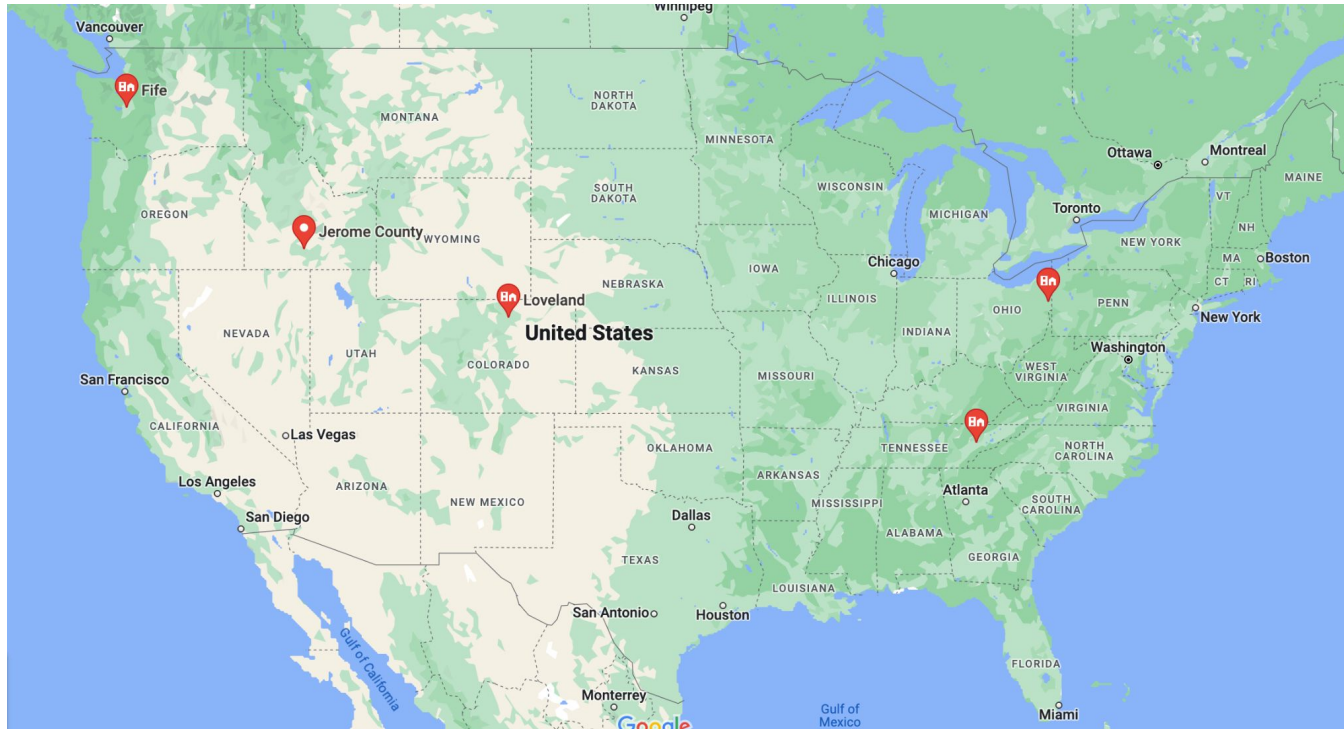
The pressure fit system that keeps HempWool in place with no slumping or sagging means better overall performance. HempWool will help reduce your heating and cooling costs: the high thermal inertia of HempWool makes it a phase-shift resistant material, keeping the home comfortable all year round.

Why Hemp?

R Value	Depth	Panel Length (In)	Panel Width (In)	Price per SqFt
R7	2"	48"	15.25" (16" OC) / 23.25" (24" OC)	\$0.89 / sqft
R13	3.5"	48"	15.25" (16" OC) / 23.25" (24" OC)	\$1.19 / sqft
R20	5.5"	48"	15.25" (16" OC) / 23.25" (24" OC)	\$1.69 / sqft
R28*	7.5"	48"	15.25" (16" OC) / 23.25" (24" OC)	\$2.39 / sqft

Hemp insulation is a 1:1 replacement for traditional insulation.

Distribution & Warehousing



5 Distribution warehouses across the US, including our Idaho Manufacturing Facility. There are more to come!

HempWool can be purchased directly from buyhempwool.com or through our sales team sales@hempitecture.com

Technical Data Sheet

(Soon to be updated!)

Standard	Property	Performance
ASTM C209	Density of insulation	2.18lbs/ft ³ / 35Kg/m ³
ASTM C518	Thermal Resistance	R3.7/in
	Thermal Conductivity	0.040W/m.K
ASTM E1354	Vapor Permeability	0.647 Perms / 37ng/Pa.s.m ²
ASTM E96-E96M	Water Vapor Transmission Performance	Not a vapor barrier (Above 60ng)
ASTM C1338-19	Microbiological Resistance to Fungi	No fungi growth
ASTM E1354	Standard Test Method for Heat and Visible Smoke Release Rate	
	Ignition Time	6.67 sec.
	Average Heat Release Rate	5.74 (BTU/s/ft ²)
	Total Heat Release	642.8 (BTU/s/ft ²)
	Heat Release Maximum Rate	10.98 (BTU/s/ft ²)
	Total Smoke Release by Surface Unit	217.26 (ft ² /lb)
ASTM E84	Surface Burning: Smoke Developed / Flame Spread	350 / 315 (index)



Research & Development



Photo No. 3

Unexposed Surface of the Test Specimen (Post-test)



Photo No. 4

Exposed Surface of the Test Specimen (Post-test)

intertek

Total Quality. Assured.

16015 Shady Falls
Elmendorf, Texas 78112

Telephone: 210-635-8100
Facsimile: 210-635-8101
www.intertek.com/building

TEST REPORT FOR HEMPITECTURE INC

Report No.: 105075333SAT-001

Date: May 31, 2022

SECTION 2

SUMMARY OF TEST RESULTS

Specimen I.D.: HempWool – FR27

ASTM E84 Test Results

FLAME SPREAD INDEX	SMOKE DEVELOPED INDEX
10	110

*See Section 8 for additional information and commentary

SECTION 3

TEST METHOD

The specimen was evaluated in accordance with the following:

ASTM E84-21a, *Standard Test Method for Surface Burning Characteristics of Building Materials*

There were no deviations from the requirements prescribed in ASTM E84-21a.

Research & Development

HAM Test Chamber

Oak Ridge National
Laboratory

split wall test between fiberglass and hempwool wired up with humidity, temperature, and heat flux sensors. The HempWool side had less energy escaping through the wall. A fuller case study with the data published is forthcoming!



Product line development

PlantPanel[®]



PlantPanel is a continuous insulation sheathing material used to eliminate or reduce thermal bridging in exterior building material envelopes.

It is clad to the exterior of a new or existing structure. Made with 60% plant based content, this product is ideal for retrofitting homes or buildings. It can be used alone or in conjunction with HempWool insulation.

PlantPanel is a new product addition to Hempitecture's product line. It is treated with biobased fire retardants to improve fire resistance.

Coming soon

Product line development

PlantPad



PlantPad is a natural fiber carpet underlayment material.

This material is made at a contractor grade density with no added chemicals, is VOC free, and Red List Ingredient Free.

It is used to replace conventional carpet pad materials that are made with synthetic foams.

Over time, synthetic foam material breaks down and becomes airborne, causing indoor air pollution. PlantPad is a sustainable, biobased alternative.

Coming soon

Product line development

 **FiberFill**[®]



FiberFill is a product that Hempitecture has developed in conjunction with funding from NYSERDA. This loose fill insulation material is 100% plant based. Consisting of virgin and recycled plant fiber, it is in a blowable form that is ideal for attic retrofits.

FiberFill will be commercialized in 2023 with a new location in New York State as the primary production facility for FiberFill.

The material is treated with biobased fire retardants to improve resistance to fire, while remaining nontoxic and high performing.

Coming soon



Installing Hemp Insulation

How to Install HempWool®



Installing Hemp Insulation



Installing Hemp Insulation



Installing Hemp Insulation



Healthy Materials belong in our Buildings



Research and Incentives for energy efficiency improvements through the Inflation Reduction Act & Beyond

IRA Resources Database

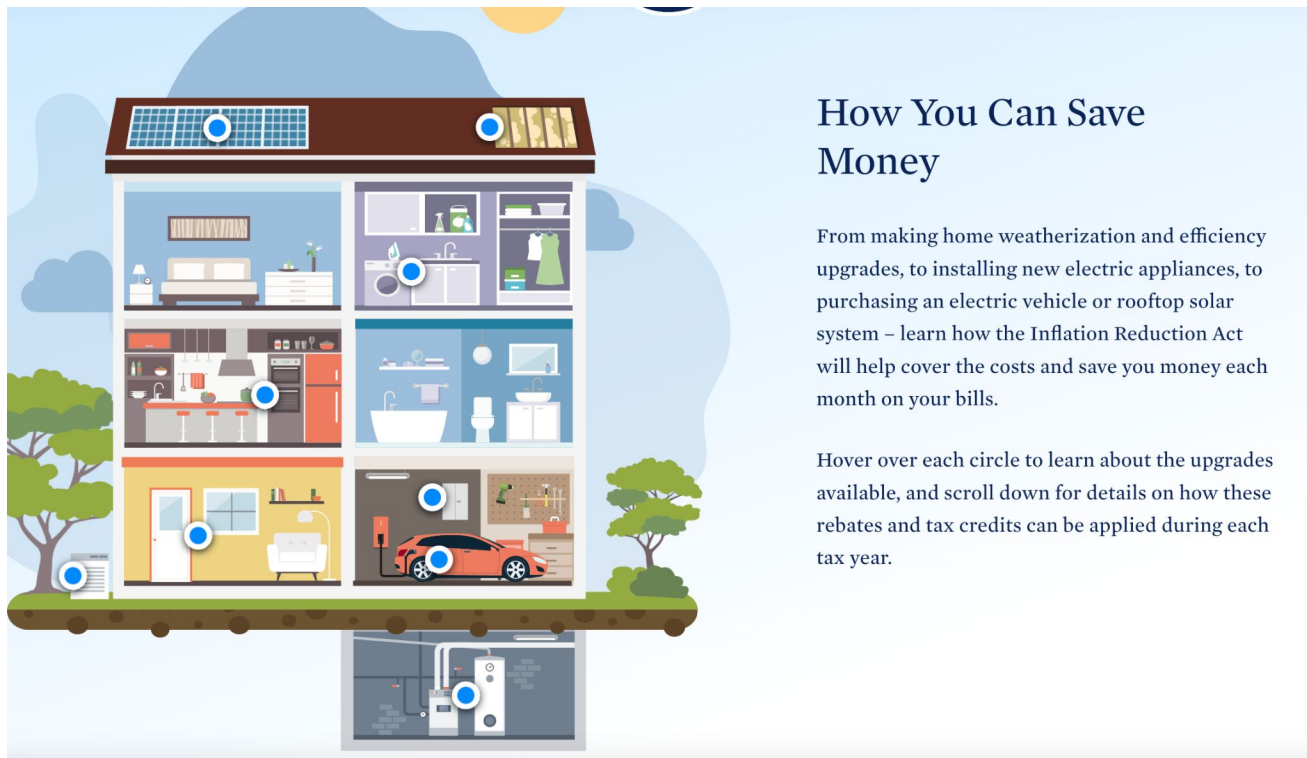
This database is intended to serve as a resource hub for non-federal actors looking to understand and access the climate provisions of the Inflation Reduction Act (IRA).

Updated regularly, the database collects in one place helpful summaries, guidance, tools, and analysis created by the federal government and climate community pertaining to the multitude of tax credit, grant, and loan opportunities in the IRA. Structured searching and filtering allow for quick navigation.

[Access this database here.](#)



Tax Credits and Rebates for Families (Whitehouse.gov)



How You Can Save Money

From making home weatherization and efficiency upgrades, to installing new electric appliances, to purchasing an electric vehicle or rooftop solar system – learn how the Inflation Reduction Act will help cover the costs and save you money each month on your bills.

Hover over each circle to learn about the upgrades available, and scroll down for details on how these rebates and tax credits can be applied during each tax year.

This webpage provides information about the White House's efforts to promote clean energy and reduce greenhouse gas emissions through the Inflation Reduction Act.

They provide details about incentives for families to upgrade their homes with energy-efficient improvements such as insulation or heating and cooling systems:

[Click the link here.](#)

Federal Income Tax Credits and Incentives for Energy Efficiency

EnergyStar provides information about federal tax credits for energy-efficient home improvements, such as insulation, windows, and HVAC systems. It outlines the eligibility requirements, the amount of the tax credit, and the expiration dates for each category of qualifying improvements. The page also includes links to additional resources and guidance for homeowners who want to take advantage of these tax credits:

[Click here to learn more.](#)



Renew America's Nonprofits

The Renew America's Nonprofits program—referred to in President Biden's Bipartisan Infrastructure Law as the Energy Efficiency Materials Pilot Program—will reduce carbon emissions and lower utilities costs at buildings owned and operated by 501(c)(3) nonprofits, allowing critical funds to be redirected to mission-focused work.

[Learn more here.](#)



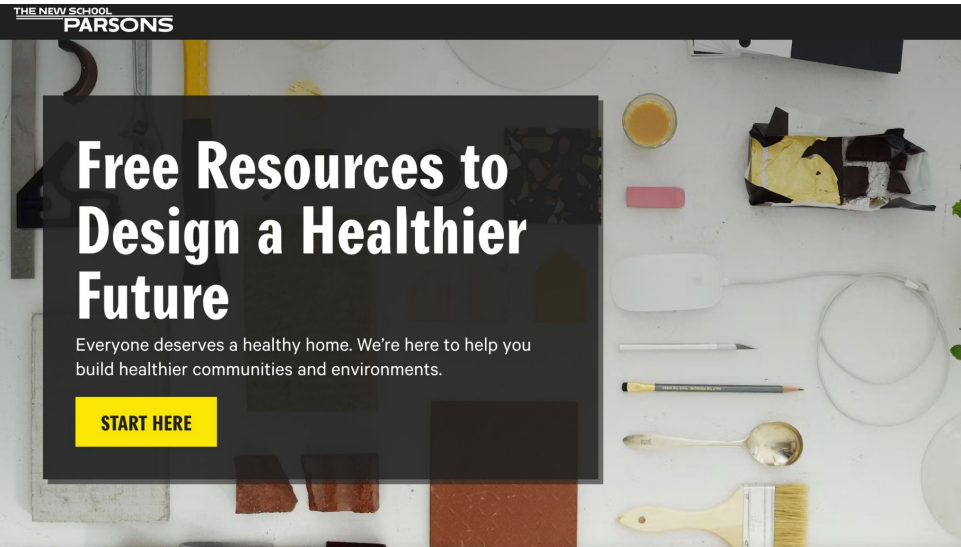
BETTER BUILDINGS INITIATIVE

The Better Buildings Solution Center is a resource for building owners and operators to find energy-efficient solutions for their buildings. It offers case studies, best practices, and technical assistance to help organizations reduce energy consumption and save money:

[Learn more here.](#)



Additional Resources to learn more about Healthy and Carbon Smart Materials:



**THE NEW SCHOOL
PARSONS**

Free Resources to Design a Healthier Future

Everyone deserves a healthy home. We're here to help you build healthier communities and environments.

START HERE

Parsons New Schools (NY)
[Healthy Materials Lab](#)



EMBODIED CARBON CITIES POLICY TOOLKIT

Table of Contents

- [Why Cities Can Lead in Reducing Embodied Carbon](#)
- [Embodied Carbon 101](#)
- [Environmental Justice and](#)

This resource library was made in partnership with C40 Cities.



Why Cities Can Lead in Reducing Embodied Carbon

[Rocky Mountain Institute \(RMI\)](#)

EPA put out an RFI for Sustainable Marketplace/Environmentally Preferable Purchasing Program(Due May 1st)

 SUPPORTING & RELATED MATERIAL

Request for Information (RFI) to Support New Inflation Reduction Act Programs to Lower Embodied Greenhouse Gas Emissions Associated with Construction Materials and Products

Posted by the **Environmental Protection Agency** on Jan 25, 2023

[Access the RFI Here](#)

Q & A



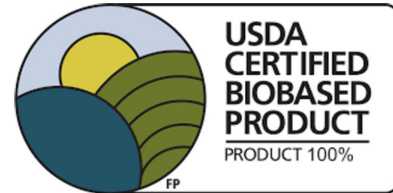
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Climate Action & Buildings

Passive House — A Record of Success

data analysis: Steven Winter Associates

