Sustainable and Locally Sourced Building Materials for Maui County

Office Of Climate Change, Resilience, and Sustainability (CCRS)

Why generate building materials locally and sustainably?

- Helps our environment
- Builds a circle economy
- Material Security
  - More control over the supply chain
- Work force opportunities

Timber Bamboo

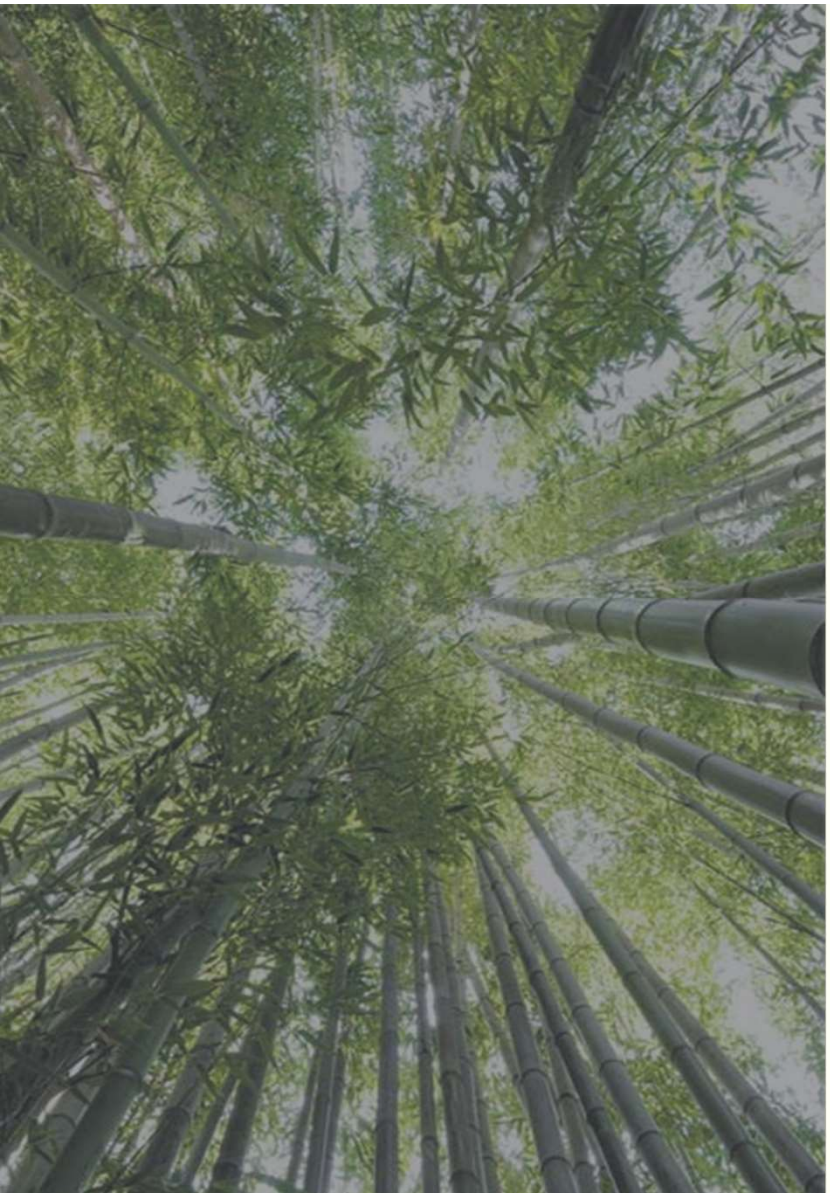
Industrial Hemp

Materials

Three R’s

Timber Bamboo

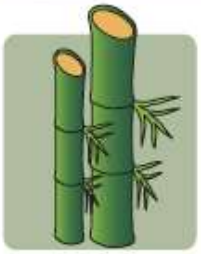
- Bamboo has long been a structural building material in tropical regions for centuries.
- Bamboo has been allowed in the US since 2007 when Hawai‘i-based architect David Sands got a single species of bamboo grown in Vietnam approved by the International Code Council (ICC).
- Bamboo is fast growing and regenerates quickly after harvest.



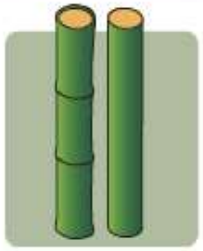
Benefits to the Planet

- Bamboo has a complex root network that anchors the soil down, helping to prevent erosion.
- Helps soil retain water
- Bamboo also absorbs more tons of CO2 than trees due to its extreme growth rate.
- Bamboo is entirely recyclable

How is Bamboo converted to Flooring?



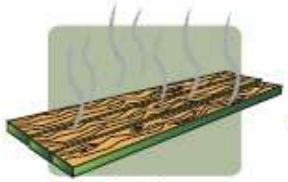
Bamboo Shoots



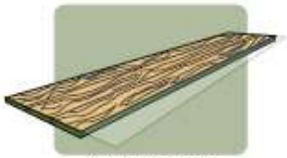
Sizing & Knot Removal

Slicing

Anti-Insect Treatment



Drying



Lamination

Carbonization

Cutting & Molding

Sanding

Coating

Shipping

Finished Floor

Bamboo Houses

Photo: Bamboo Living for Sammy Hagar in Maui.
2 or 3 Bedroom, 2 Bathroom.
938 SF Interior I 500 SF Porch
160 SF Loft Signature Bamboo
Home Package: $131,645

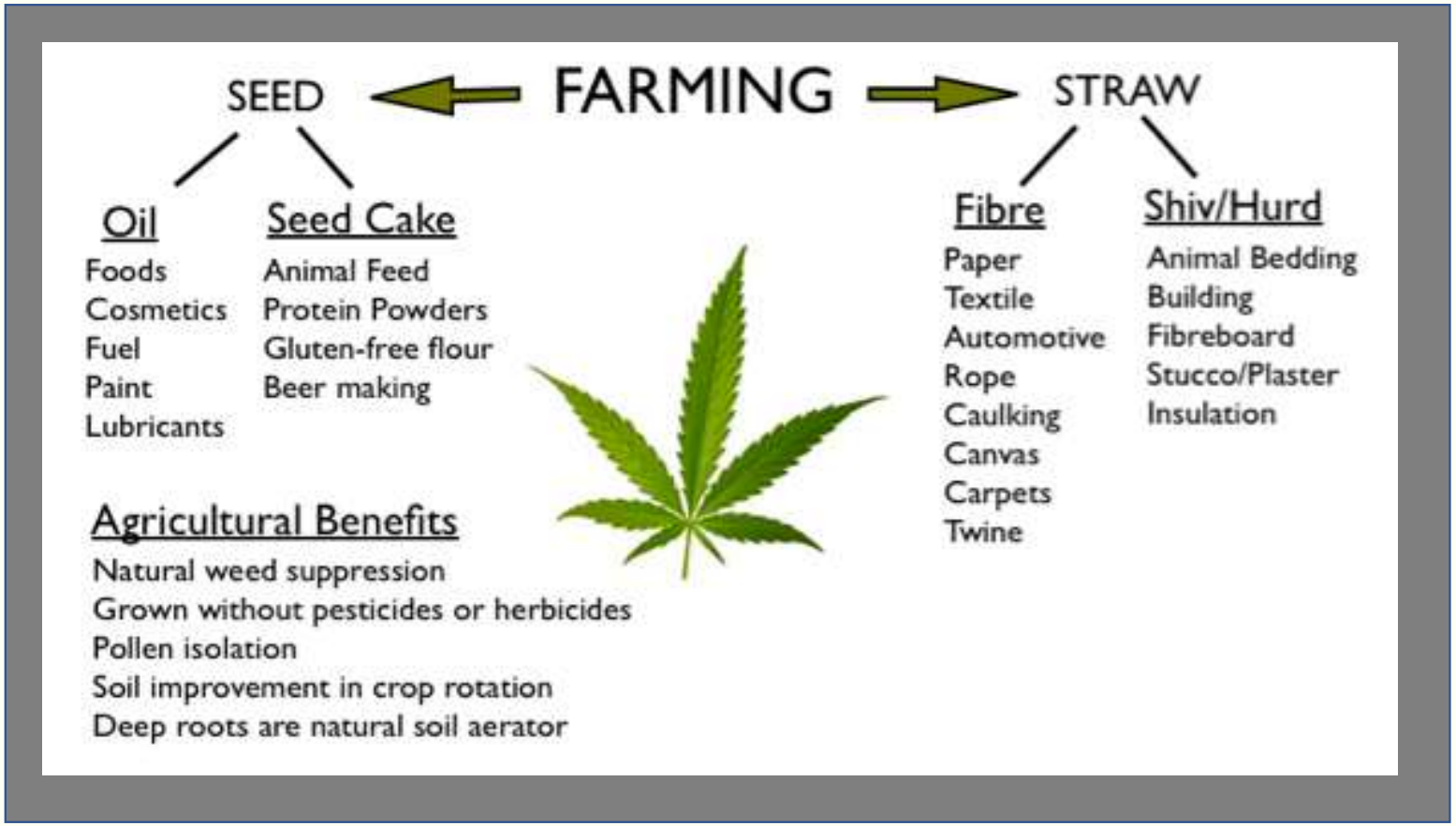
Photo: Bamboo Living Model
Bonsai Tiny House. 20'L x 8'-4"W (Customizable up to 30'L)
184 SF Interior.
Base price: $19,800

Photo: Whispering Winds Bamboo carports and sheds

Industrial Hemp

- Hemp is from the plant species Cannabis sativa.
- However, industrial Hemp grows tall 6-15ft), is higher in fiber, and needs to have 0.3 % or less THC (Agriculture Improvement Act of 2018 (the 2018 Farm Bill)).
- Hemp structures aren't new and date back to Roman times.

Industrial Hemp



HEMP HOMES

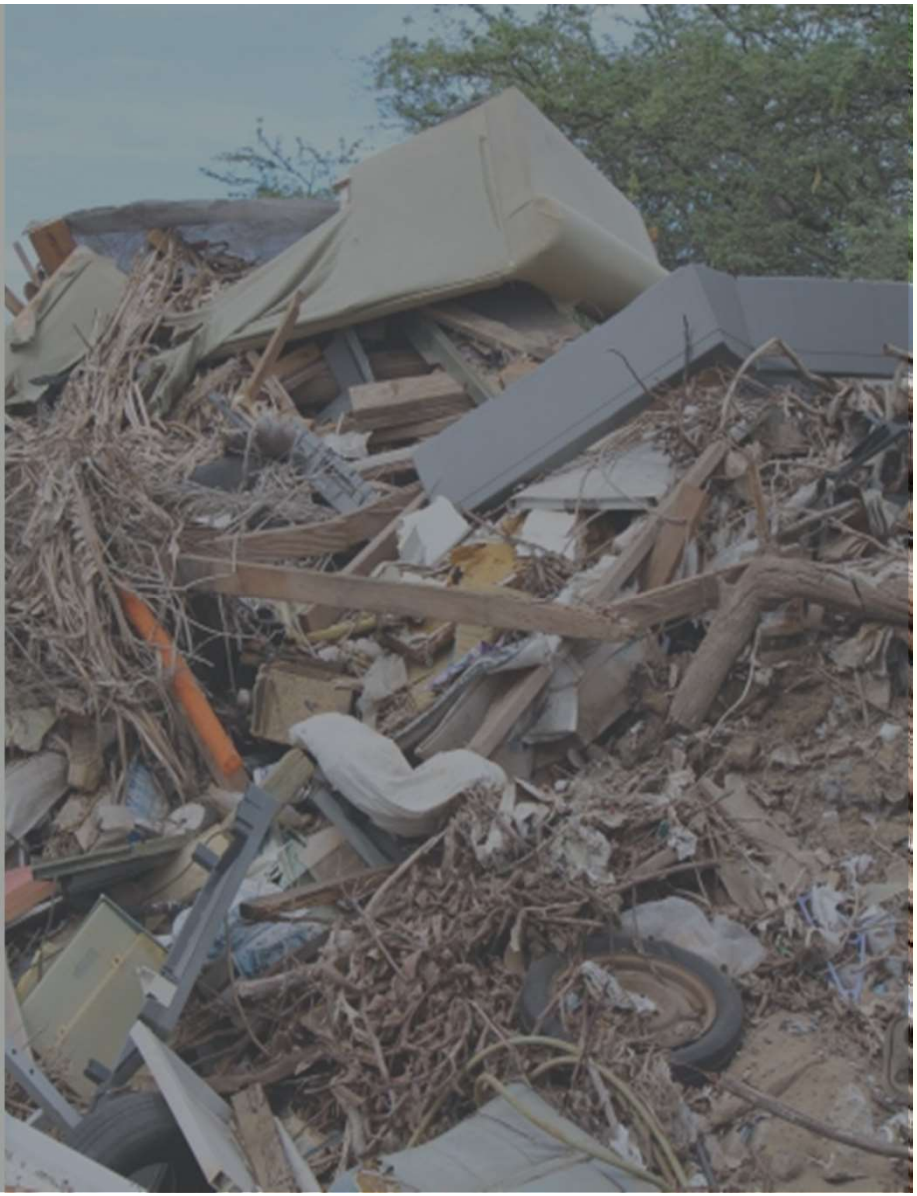
HEMPCRETE

HEMP INSULATION

BUILDING MATERIALS

Environmental Impact

- Hempcrete can sequester 19 pounds of CO_2 per cubic foot.
- Hemp is able to lock up more carbon per hectare than just about any other plant, including trees.
- When this biomass is harvested, mixed with lime, and put into a building, it locks up that carbon for the lifetime of the building.
- Hempcrete absorbs more carbon than it emits during its manufacture, making it carbon negative.



Construction Waste

- Concrete represents more than half of the debris generated by building construction and demolition.
- Hempcrete can't be used for structural sections of a building, but it can be used to replace non-structural elements of walls that traditionally use concrete.
- Hempcrete can also be used in place of drywall and plaster, which account for about 8% of building construction debris.

Hemp Home in Maui

Hemp ‘Ohana built and designed by Architect George Rixey in 2015

Three R's

- Reduce waste.
  - Build smaller homes.
- Reuse, repurpose, or upcycle.
  - Reuse materials in new builds and repurpose materials in renovations.
  - Habitat for Humanity.
- Recycle building materials.
  - Reduces the demand for new resources.
  - Cuts costs related to the production and transportation of new materials.
  - Eliminates the need to send waste to landfill sites.

Recommendations

- Conduct a study examining materials, technologies, design, construction, and overall operation of sustainable building options.
- A pilot program to test out these materials in our climate and topography
- Building codes could be a parallel discussion





Contact us

Hannah Shipman
Green Building and Resilient Housing Specialist
CCRS

Email: Hannah.shipman@mauicounty.gov
Direct: 270-3122
Cell: 867-0352

Office Of Climate Change, Resiliency, and Sustainability (CCRS)

CARE Committee

From: Hannah Shipman <Hannah.Shipman@co.maui.hi.us>
Sent: Wednesday, February 2, 2022 8:27 AM
To: CARE Committee
Subject: Re: Presentation for agenda item CARE-11- updated
Attachments: CARE Committee sustainably and locally sourced building materials to CARE.pptx

Aloha CARE Committee,

I have attached my updated presentation slides for Agenda item CARE-11 below.

Thank you

Hannah Shipman, *LEED Green Associate*
Green Building and Resilient Housing Specialist
Office of Climate Change, Resilience, and Sustainability (CCRS)
County of Maui
808.867.0352

>>> Hannah Shipman 2/1/2022 4:03 PM >>>
Aloha CARE Committee,

I have attached my presentation slides for Agenda item CARE-11 below.

Thank you

Hannah Shipman, *LEED Green Associate*
Green Building and Resilient Housing Specialist
Office of Climate Change, Resilience, and Sustainability (CCRS)
County of Maui
808.867.0352