



# World Bamboo Congress

## Bamboo Fiber for Industry

August 15, 2018

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Presenter:

**David Knight**  
Co-Founder, President/CEO



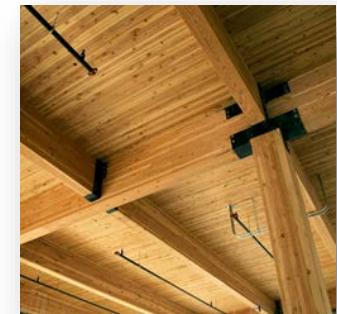
# Resource Fiber – The Only U.S. Integrated Bamboo Fiber Company

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Bamboo and its unique material properties are significantly underutilized in large-scale industrial applications.

Resource Fiber is:

- manufacturing high performance bamboo products;
- growing a sustainable bamboo forest in Alabama to support its bamboo product strategies; and
- selling bamboo fiber to other industrial users.



# Recognized Industry Leaders

**100+ years** experience in bamboo industry

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**David Knight, CBI**  
Co-Founder, Investor  
President/CEO  
Co-Founder, Teragren Bamboo



**Ann Knight**  
Co-Founder, Investor  
CCO/EVP  
Co-Founder, Teragren Bamboo



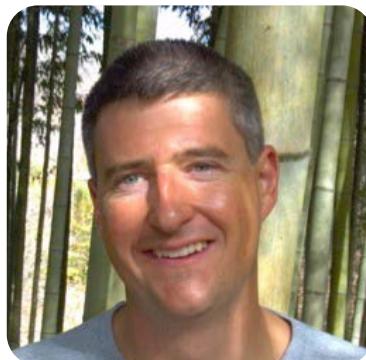
**Marsha Folsom**  
Co-Founder, Investor  
Chief Development Officer  
Former First Lady, Alabama



**Mary Valenta, DBA,CPA**  
Financial Expert, Investor  
Principal, On The Green  
Former CFO, O'Neal Steel



**Lee Slaven**  
Investor  
COO, Manufacturing  
Former R&D Director, Teragren



**Roger Lewis**  
COO, Agriculture  
Investor  
Principal, Lewis Bamboo



**Scott Bryant**  
Land Asset Manager  
Investor  
Principal, Cyprus Partners

# Recognized Industry Professionals Lead Resource Fiber

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Co-founders David and Ann Knight established Teragren Bamboo in 1998 with an emphasis on environmentally and socially responsible practices.

- 1 million SF manufacturing facility in China
- Grew revenue 30% to 40% annually for over 10 years
- Rated #1 in *Consumer Reports* multiple years running
- Teragren serviced over 4,000 flooring stores in North America



# Notable Teragren Installations

## Notable Installations

A curated selection of commercial and public projects that use Teragren products



**RIO PIEDRAS  
APARTMENT BUILDING**

Location: San Pedro Sula, Honduras. Signature Naturals Bamboo Flooring and Vertical Grain Caramelized Panels



**U.S. ENVIRONMENTAL  
PROTECTION AGENCY**

Location: Denver CO  
Signature Naturals Bamboo Flooring and Vertical Grain Caramelized Panels



**CHICAGO MUSEUM OF  
SCIENCE & INDUSTRY**

Location: Chicago IL  
Synergy® Strand Bamboo Solid-Strip Flooring



**U.S. DEPARTMENT OF ENERGY  
SOLAR DECATHALON**

Location: Washington DC  
Traditional Bamboo Panels and Specialty Developed Open-Web Bamboo Joists



**WEST COAST GREEN  
HARBINGER HOUSE**

Location: San Jose CA  
Signature Colors Bamboo Flooring



**YALE UNIVERSITY'S  
GREEN BUILDING PROJECT**

Location: New Haven CT  
Synergy® Strand Bamboo Solid-Strip Flooring



**HUTTON HOTEL**

Location: Nashville TN  
Synergy® Strand Bamboo Solid-Strip Flooring and Strand Panels



**AMGEN RESEARCH +  
TECHNOLOGY CENTER**

Location: Seattle, WA  
Signature Naturals Bamboo Flooring, Vertical Grain Natural Panels and Custom Stair Parts

# Why Create Sustainable Companies?

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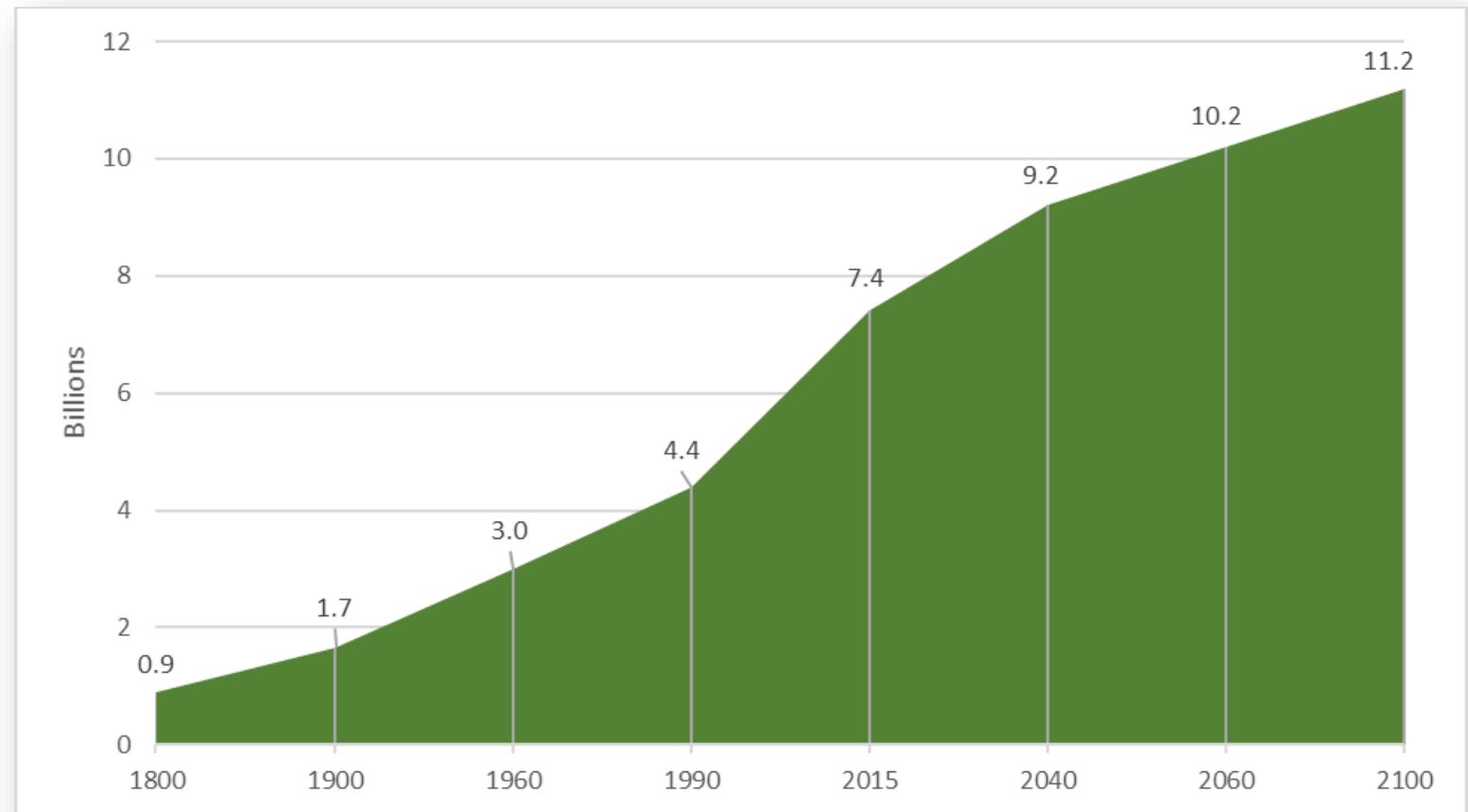
- Sustainability must balance:
  - ✓ responsible environmental management
  - ✓ social justice
  - ✓ wealth creation
    - corporate and local communities

The world needs it....



# Global Population (billions)

- Already 40% over carrying capacity of earth
- Adding ~80 million people annually
- 2.4 billion MORE people in next 30 years



Source: UN Population Division (2015)

# Global Middle Class

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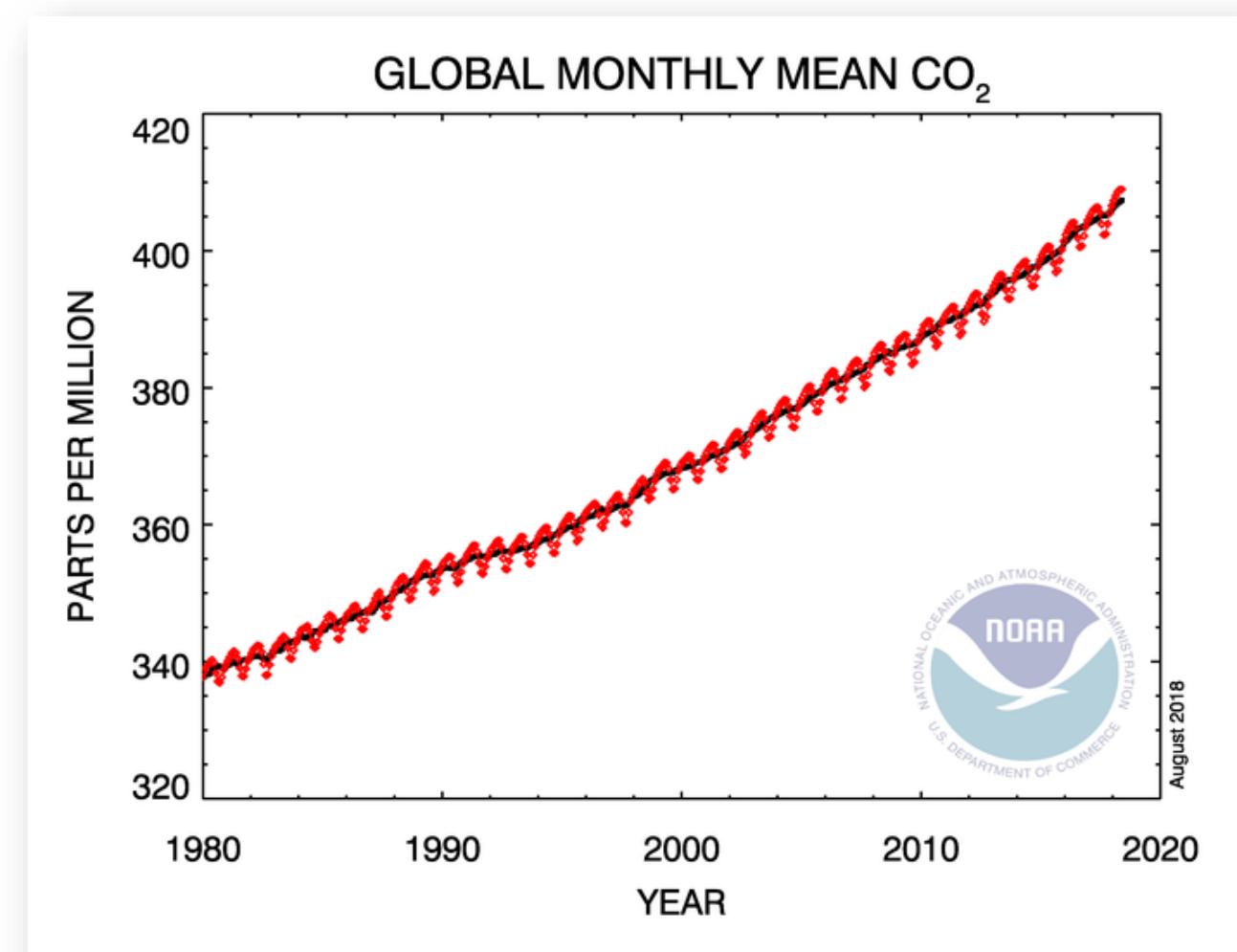
- Triple use of natural resources by 2050
- Fiber demand to continue pressure on native & old growth forests



Source: Brookings Institute (2017)

# Carbon Emissions & Climate Change

- Atmospheric carbon – 409 PPM
- Hasn't been this high in 800,000 years
- Ice melting, storms and droughts intensifying, oceans warming, sea levels rising
- Carbon footprint of middle class is 50% higher
- Average human uses 100 pounds of plastic each year



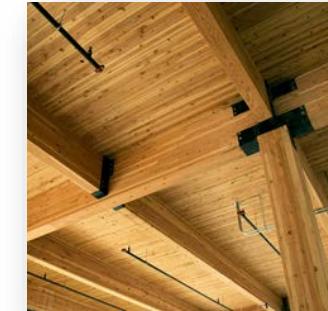
Source: NOAA (2018)

# Resource Fiber Is In The Materials Business

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Bamboo and its unique material properties are significantly underutilized in large-scale industrial applications.

- Middle class are consumers
- Consumption behavior won't drastically change
- Materials used in products must change
- Bamboo can make a big difference....



# Why Bamboo?

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## Rapidly Renewable

- Yields 6X more fiber than trees
- Plants withstand extreme weather events

## Sustainable

- Captures 5X more carbon than a like-sized wood forest
- Requires little water, no synthetic fertilizer or pesticides

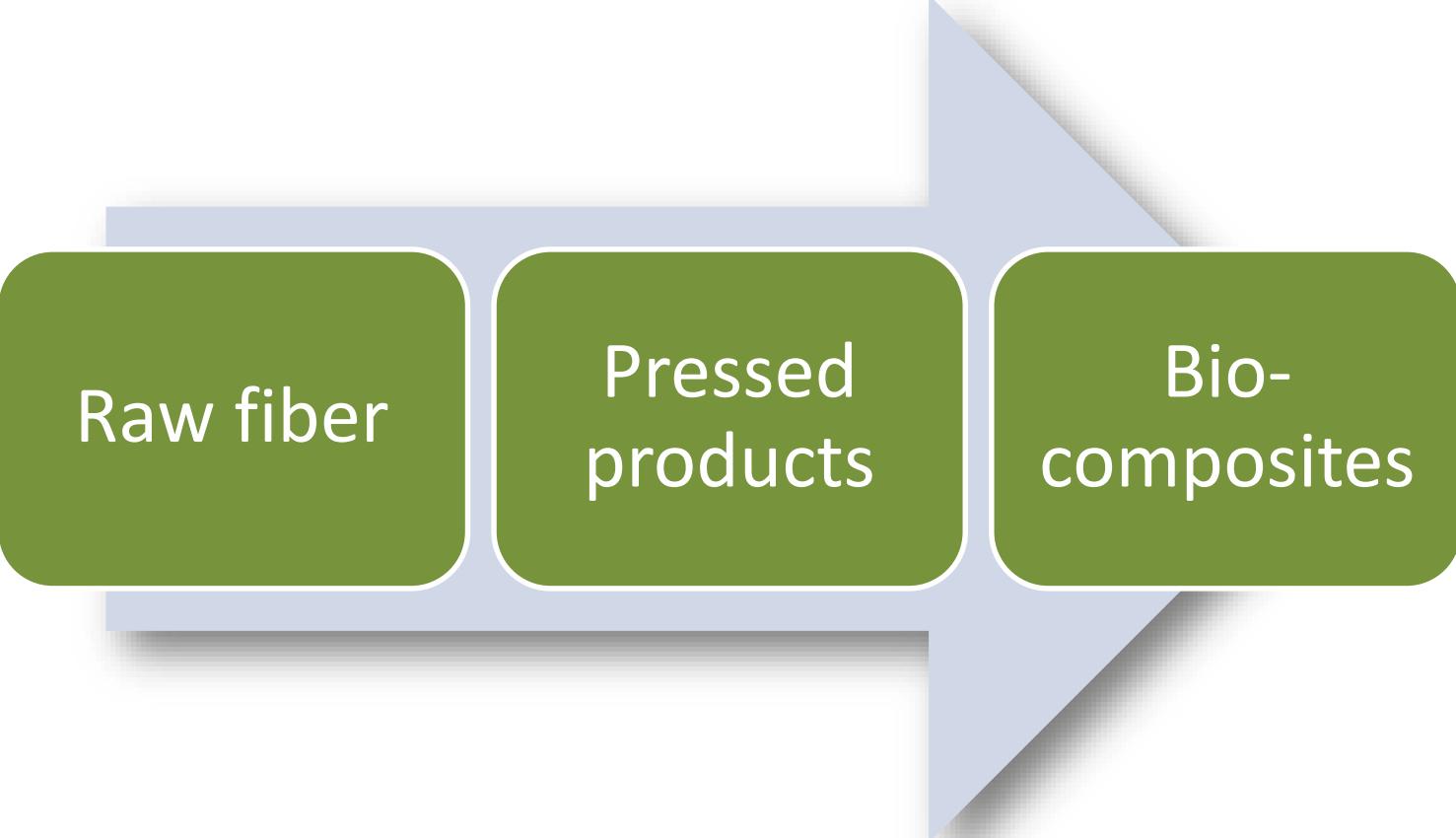
## Versatile

- Lightweight with the tensile strength of steel
- Superior mechanical properties
- Used in industrial products and integrated into plastics and carbon fiber



## 3-Pronged Market Approach

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Raw fiber

Pressed  
products

Bio-  
composites



## Industry Problems

◎ Limited old growth wood fiber

◎ Toxins

◎ Carbon

◎ Waste

## Bamboo Solutions

✓ Products properly engineered and manufactured replicate old growth wood fiber

✓ No creosote or toxic preservatives required

✓ Bamboo & its products can durably sequester carbon

✓ Bamboo fiber displaces petroleum-based fibers in plastics, carbon fiber & polymers

✓ No waste. Cradle-to-cradle manufacturing; also used in biocomposites

# Resource Fiber In-Field Bamboo Nursery

- Located in Alabama
- 100 acre in-field nursery
- Largest commercial-scale bamboo nursery in U.S.



# Bamboo Farms

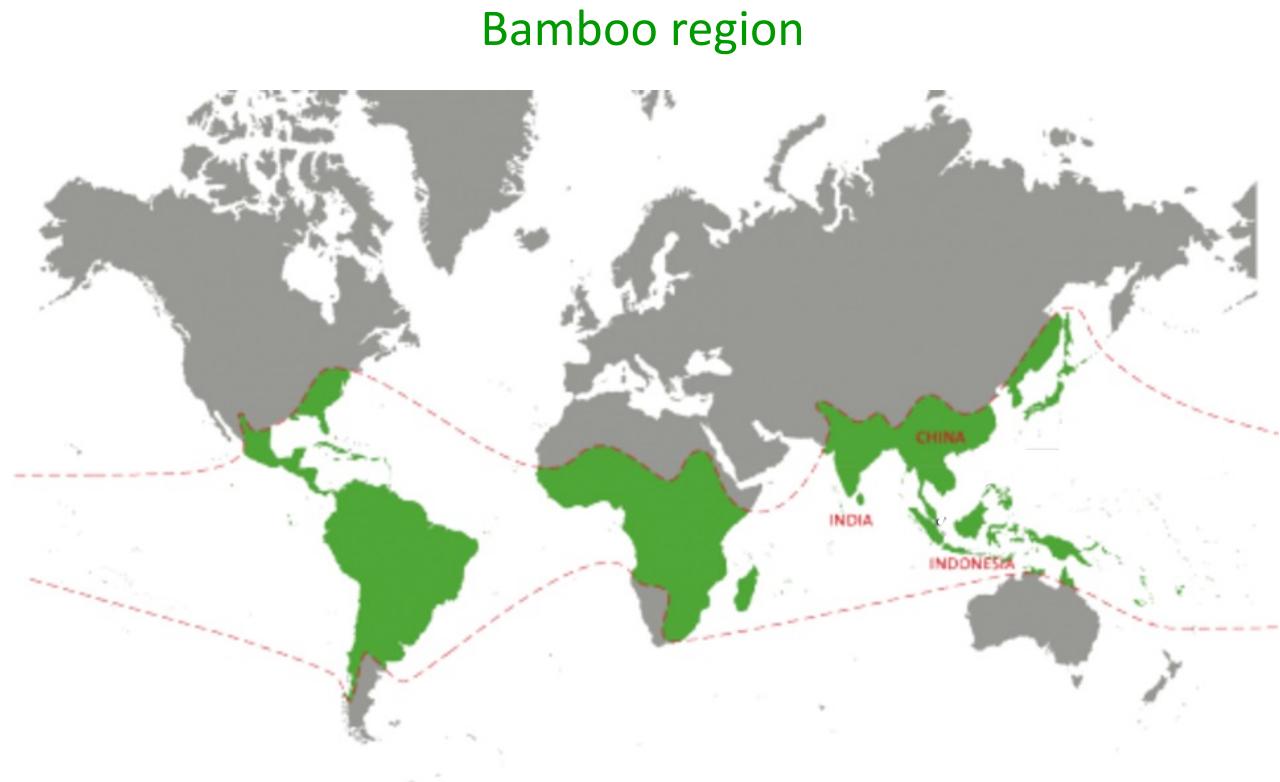
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- Resource Fiber-owned farms
- Preferred Farmer Program
  - ✓ U.S.
  - ✓ International
- Companion plants for soil nutrition



# International Supply Relationships

- Developing pre-processing facilities globally to export bamboo mats to U.S.
- Goal to manufacture & sell bamboo products regionally
- Support local communities by developing local bamboo resources and creating jobs
- Help existing native bamboo forests become more productive



- Increase carbon sequestration through Resource Fiber's managed bamboo forest initiative

# Built to Scale

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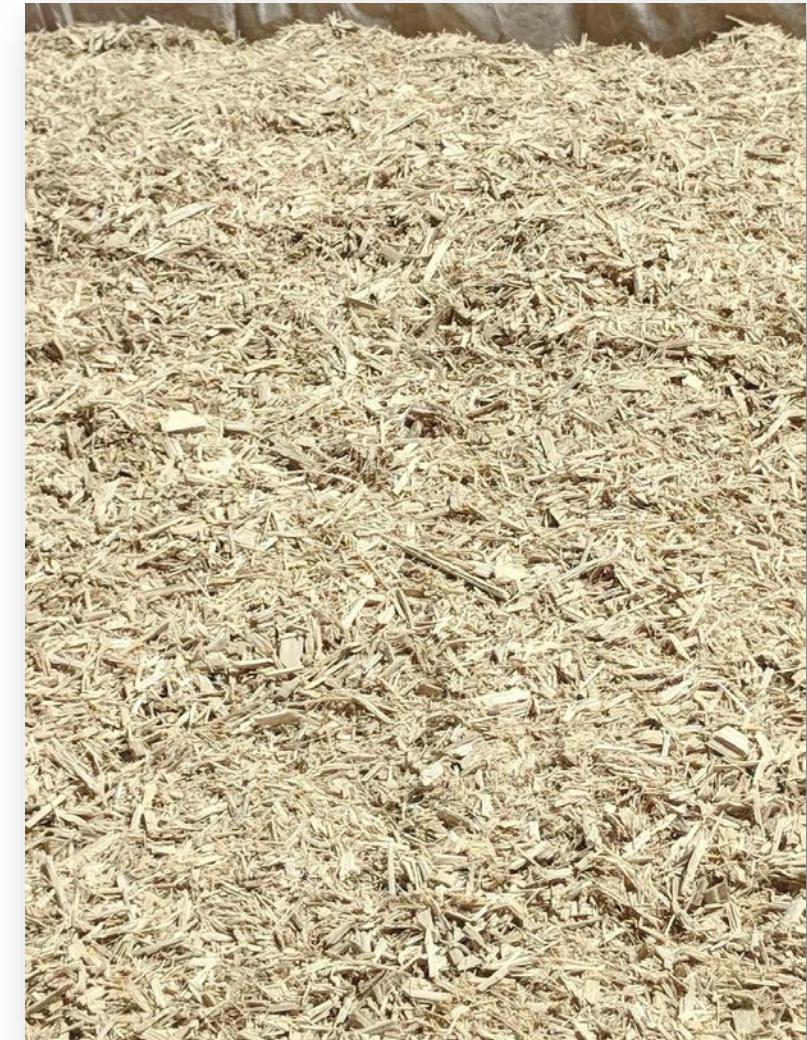


- Manufacturing process designed to replicate
- Replicate in U.S. & other countries
- Manufacturing located within bamboo regions
- Wide variety of products utilizing same manufacturing process
- Start with pre-processing facility for bamboo mat export, expand into finished products

# Raw Bamboo Fiber

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- Off-fall from manufacturing process
- Biomass bamboo farms in U.S.
- Bio-composites
  - ✓ Plastics
  - ✓ Carbon fiber
  - ✓ Polymer for additive manufacturing (3-D printing)
- Mechanical properties superior to hemp, jute & other plants



# Additive Manufacturing (3-D Printing)

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- World record for largest 3-D project
- Oak Ridge National Laboratory
- Utilized Resource Fiber bamboo fiber

- Printed Cobra (no bamboo)
- Future of manufacturing

# Attracting Major Corporate Customers

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- Large industrial customers
  - Four Berkshire Hathaway companies
  - Largest tall building form contractor in U.S.
  - Several railroads
  - Top tier furniture manufacturer
  - Others in U.S. transportation sector



# Supported by Major Strategics

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Structural + Civil Engineers

# Department of Energy Grant Funding for Bamboo Biocomposites

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- Awarded \$80,000
  - ✓ Research & Development
  
- Awarded \$551,000
  - ✓ Transportation product
    - ✓ Light weighting
    - ✓ Reduction in supply chain energy use
    - ✓ Cradle-to-cradle
    - ✓ Competitively priced

# Carbon Positive Strategy

*Carbon Positive is the state at which an entity is removing/absorbing more GHG than it is emitting.*

*William McDonough, FAIA, William McDonough + Partners Architects  
Co-creator of the Cradle-to-Cradle®  
products program*

Operate with 100%  
Renewable Energy

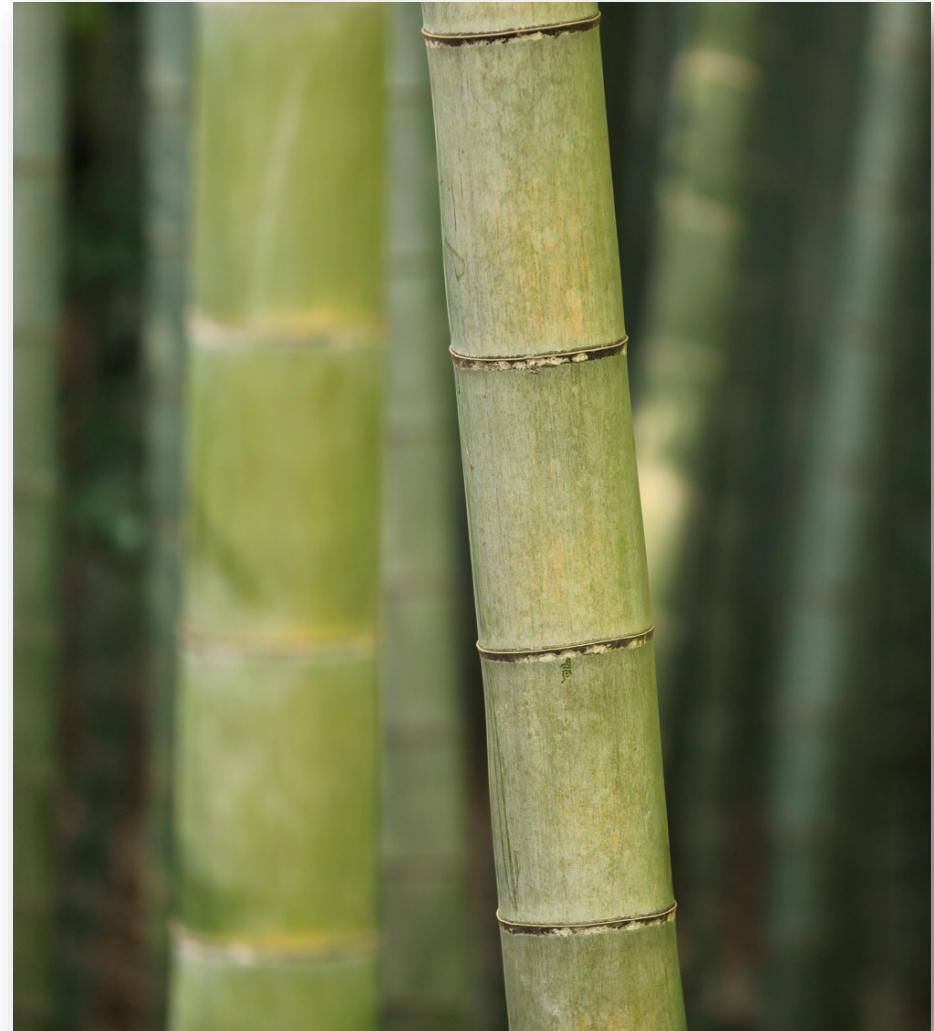
Develop Bamboo  
Carbon Offset  
Program

Monetize Bamboo  
Carbon Offsets

# Summary

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- U.S. Demand
  - ✓ Industrial demand increasing
  - ✓ Some companies require domestic U.S. supply
  - ✓ Sustainability increasingly important
  - ✓ Carbon offsets important
  - ✓ U.S. industries embracing bamboo now
    - Transportation
    - Construction





# Thank you

**David Knight**  
Co-Founder, President/CEO

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