PLANTD

The Way Ahead

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Definitions

Oriented Strand Board (OSB):

Engineered wood created by compressing wood flakes with adhesive; used in load bearing applications for home and furniture building as a cheaper alternative to plywood

Plywood:

Engineered wood created by gluing thin layers of wood fiber sheets; used in numerous applications with various tiers of structural integrity

Medium Density Fiberboard (MDF):

Engineered wood created by combining wood fiber with wax and adhesive and applying high temperature and pressure to form panels; process may release harmful carcinogens

High Price Volatility of Materials

Cost of OSB

\$6: low demand \$40: peak season

Cause

Homebuying Cycle throughout the

year

Furniture

Volatility is translated across sectors

Growing Demand Exacerbates Damage

66%

Commercial forest land of the total forests in USA 37%

Timber harvesting

\$0.85 TN

Homebuilding market 5-year CAGR: 4.5%

Plantd: Better, Cheaper & Greener



- ✓ Perennial grass species grown in North Carolina
- 1-3 year maturity period (compare to 10-50 years for forests)
- Drought and flood resistant grass



- Automated continuous press
- ✓ Low-emissions, 100% renewable factory
- Modular and scalable design



- Drop-in replacement for OSB and plywood
- Stronger than OSB with higher moisture, warping, and fire resistance
- High carbon storagepotential

Source: Plantd

Opportunity Overview – Potential Markets

Homebuilders seeking safer, cheaper, and/or sustainable alternatives to OSB

Furniture manufacturers seeking cheaper alternatives to OSB and plywood with sustainability as added benefit

Potential Market Sizes – Big Enough!



Key Customer Insights & Takeaways

"Builders are conservative and risk-averse, they likely would not experiment with products that could be a liability"

-Homebuilding community member

"As a contractor, I want the product that is cheapest. I leave structural integrity to the engineer"

-Homebuilding contractor

"The homebuilding industry is highly resistant to change"

-Former architect

"Williams Sonoma recently had a discussion about the volatile prices of OSB and plywood and homebuilding trend impact on the furniture industry" –Product designer

"We use a lot of OSB and plywood in the upholstered furniture products." -Product designer

"FSC cannot offer us claims on carbon footprint...but plywood is not high on our priority list for sustainable options" –Sustainability lead

Plantd: How to Reach Blue Ocean



Value Proposition: Jobs Pains Gains

Customer Profile: Furniture Manufacturers



How Plantd fits in Furniture Value Chain

• IKEA, Ashley, Williams Sonoma: owned +



How to Select & Acquire the Customers

Integrated:			
Retailer, designer, and manufacturer in			
house			

Hybrid: Retailer and designer own some of manufacturing, use third parties for other manufacturing Third party w/ design control:

Third party manufacturer builds furniture "to spec" of retailer and designer

Third party w/o design control:

Third party manufacturer designs and builds furniture and sold by retailer

Target Decisionmaker:	Primary Motivation:	
Retailer/designer with in-house control of manufacturing process	Cost	Sustainability
Retailer-owned manufacturer		
Third party manufacturer		

Recommended customer acquisition strategy:

- <u>Collaborative/Strategic Partner Approach</u>: pivot prototyping offer to at-cost or at cost of shipping, in exchange for sharing the product testing results
- <u>Premium Cost Alternative</u>: If no willingness to share, use existing premium pricing strategy as an alternative
- <u>Plantd In-House Testing</u>: If no willingness to share or pay, consider in-house testing following protocol

GTM – How to enter Furniture Space



Current Value Proposition: <u>Plantd sells grass-based material to furniture</u> <u>manufacturers so they can build high quality furniture at</u> <u>competitive price on time at projected costs cheaper than</u> <u>MDF and plywood</u>.

Product Messaging and Marketing Tactics:

- Cheaper, Better, stably priced, non-toxic material
- When applicable, sustainability benefits are also touted (avoid as primary value-add)
- By dominating the furniture market Plantd will have the brand recognition and reliability necessary to break into the commoditized market of homebuilding later

Risks and Cautions: Finger on the Pulse

Hypothesis

- OSB, plywood, MDF are **NOT** made from waste wood or sawdust
- Plantd's production supply chain (farmers) is secure.
 As Plantd scales there is **NO** volatility in pricing
- Supply chain or price fluctuation of current materials is **NOT** a Covid only phenomenon

Preserve Advantage

- Target Customer Segment for MOAT start with furniture market and later commoditize
- Plantd targets perception battle via marketing strategy—Grass is **NOT ANTS!**

• Keep an eye out for competitors like Hempitecture who are working on similar materials

The Way Ahead: Sustainability

Key Takeaways

- Forest-Stewardship Council offers social and environmental impact, but NOT carbon impact.
- Other materials are higher priority for select sustainability teams (foam, textiles, plastics) than wood-based products.
- Product teams are not aware that OSB is not only a waste product.

Next Steps

- Emphasize the importance of carbon measurement from Plantd products; consider timeline for full LCA.
- Target decisionmakers with cost as key priority over sustainability (manufacturing teams, product designers).
- Ensure prospective customer communication is clear about OSB impact.

The Way Ahead: Commercialization

Key Takeaways

- China and India material innovation has the potential to disrupt Plantd's target market.
- Furniture manufacturing factories bear the cost of ongoing fluctuation of raw material prices (NOT the retailer).
- Select companies will not be willing to product test without third party material testing.

Next Steps

- Focus on price stability offered by Plantd's product and emphasize impact of local production.
- Seek entry point via furniture factory team, both those owned by retailer/designers and third-parties.
- Through additional conversations, consider most valuable material testing to validate performance.

Questions?

Thank you!



APPENDIX



Value Proposition: Jobs Pains Gains





Case Study: Emissions of a Chair & How to Reduce it



Clara Chair vs PLC Lounge Chair



CLARA CHAIR 91.38 kg CO₂e MATERIALS FINISH FABRIC 28.00 kg CO.e 0.39 kg CO.e 50.56 kg CO_e 53



PLC LOUNGE CHAIR 23.36 kg CO.e MATERIALS FINISH 2.25 kg CO,e 0.13 kg CO.e

FABRIC 9.84 kg CO,e

Ways to Lower Furniture's Carbon Footprint



Use of waste

materials









Renewable materials

Sustainably harvested materials







Low impact fabrics and resourceful use of fabric

Removable covers

100% post

consumer plastic

Easy deconstruction into single materials

replacement parts

Reduced plastic and foam

Low VOC. water-based finishes

- Materials and Fabric are the most carbon intensive ٠
- The PLC Lounge Chair contains 99.24% renewable • materials (solid oak, oak veneer and pressed plywood) - while the Clara Chair, by comparison, contains only 13.45% renewable materials

PLANTD: Overview



Plantd specializes in creating sustainable, carbonnegative building materials. Their innovative approach involves transforming fast-growing perennial grass into durable home construction products. These materials offer environmental benefits by retaining atmospheric carbon dioxide within the structure of buildings.



Plantd will use Series A (10mn) funding to establish their agriculture supply chain and build the first-of-its-kind, modular automated continuous press for engineered building materials. The company is currently working with the nation's largest builders and architects to integrate these materials into their projects and quickly make them a standard in the industry.

Segmentation of Sustainable Building Materials



PLANTD: Top-Down

- <u>Top-down analysis rooted in the existing</u> <u>market for green building materials</u>
- Assume the average share of structural sheathing and roof decking is 15% of the total building materials used in the U.S.
- Plantd is focusing on structural sheathing and roof decking which fall under two categories of building materials (structural building material and external building material)
- Plantd captures 1% of Green structural sheathing and roof decking market –
 =1% x (83.8bn x 15%)
 - = \$125.7m

Note: Inconsistencies were observed about the CAGR data of Green building materials (Global vs USA)

Global Market Size for Building Materials TAM: \$1.32tn Global Market Size for Green Building Materials: \$346.4 bn Share of Structural and External **Building Materials:** 32% + 25.7% = 57.7%Share of Structural Sheathing and Roof Decking: 15% SAM: \$12.57 bn **Total Revenue of** U.S. Sustainable **Building Material:** \$83.8 bn SOM: \$125.7m

PLANTD: Bottom-Up

- <u>Bottom-up</u> <u>analysis</u> <u>rooted</u> <u>in</u> <u>entire</u> <u>building</u> <u>market</u>, <u>accounting for the potential to replace traditional building</u> <u>materials</u>.
- Plantd intends to replace plywood and OSB for homebuilders
- Plantd has partnered with D.R. Horton homebuilder
- The price of OSB and plywood sheet can vary from \$20-\$90 depending upon type, thickness, size, grade etc.
- Plantd needs to sell 1mn units annually at competitive price of \$30 to generate a revenue of \$30mn and initiate the transition to green building material while also competing with other green alternatives like composite panels, bamboo plywood
- Traditional plywood and OSB players like LP Building Solutions, Roseburg forest products etc have mammoth supply chains which have been established over decades.



PLANTD: Current Product STAGE



PLANTD: Opportunity Assessment

Need	Ranking (5: best; 1: worst)	Comments	Reference
What is it?	3	Green building materials focused on structural sheathing and roof decking	Pitch deck
Who has it? (potential customer)	4	Homebuilder association and retail homebuilders	Pitch deck and interview
How critical is it?	3	Green benefits, cost play and ESG rating for HA	Pitch deck and interview
How pervasive is it?	4	Market analysis suggests \$30mn-\$100mn	Market sizing and interview
What are the obstacles to adoption of a solution?	2	Established supply chain of OSB and plywood and pricing	Research and interview
What is the potential WTP?	2	Price sensitive market – high volume, low risk, low margin product	Research, pitch deck and interview
Solution			
How well does it solve problem?	2	There is still not conclusive problem identification	Pitch deck
How mature is it?	3	Working on agri supply chain and establishing manufacturing capabilities	Pitch deck and Stage Gate process
Sustainability			
Basis for sustainable competitive advantage?	1	They are competing in commoditized market with a simple product	3 horizons, pitch deck and interviews
Investment			
Capital required to bring to market?	2	Considering cost of R&D and incumbents - \$50 mn	

Blue highlight indicates critical components of opportunity decisioning

Plantd: Research Suggests Huge Market...

TOP DOWN SAM (Wall Sheathing, Roof Decking and subflooring) building material - \$26 bn SOM based on barriers to entry, market share distribution, CAGR, Green building material adoption \$130 mn Predicted potential market share: ~\$30 mn - \$130 mn Market size based on competitive pricing and supply chain capacity and GTM strategy

\$30 mn

Bottom Up

Key Insights:

- Traditional OSB and plywood are manufactured using trees like aspen, pine, poplar, douglas fir and spruce which require 10-50 years to mature
- Grass used by Plantd has an estimated maturity period 1-3 years and withstands seasonal drought and flood and regenerates soil health
- Plantd produces same amount of material **using 9x less** land.
- Medium sized wood OSB mill requires **140k acres** of managed timber lands vs **15k acres** of grass plantations
- Plantd wants to establish their agriculture supply chain and build the first-of-its-kind, modular automated continuous press.
- Factory automated, low emissions, 100% electric, low fixed and operational cost, Multi-product capable (panels, studs, and CLT)

Plantd: Industry Experts Weigh In



Plantd: Numerous Risks to Overcome

Risk	Context For Plantd
Operational Efficiency	Essential to Plantd's success is their innovative manufacturing process, a cornerstone that validates their ambitious claims. Efficiency here is not just operational but also a reflection of their competitive edge.
Market Adoption	The construction sector's established supply chains and the end customer's focus on cost and functionality present hurdles in embracing eco-friendly alternatives.
Single Customer Dependency	Relying predominantly on DR Horton exposes Plantd to fluctuations in one company's demands or strategy shifts, risking revenue stability.
Cost	Without the benefit of economies of scale, Plantd may struggle to offer competitive pricing, potentially stalling broader market acceptance.
Intellectual Property	In the absence of robust IP protection, Plantd's innovations are vulnerable to replication by larger industry players, threatening their unique market position.

Plantd: Addressing Risks as a Next Step

We will focus on the following areas for commercialization planning as we move into Phase 2:

) Customer Portfolio Expansion

Broaden the client base to reduce dependency on a single customer and stabilize revenue streams. The carbon-capture capabilities of the product have been proven. Homebuilder Associations' benefit from a cost-play and **ESG score** boost.

Market Education and Engagement

Intensify efforts to educate the market on the environmental and functional benefits of Plantd's products to foster broader adoption. They should start working on branding and marketing.

Team's Next Steps:

- ✓ Gather green building insights from Duke professor (Chris Wedding)
- Calls scheduled with HVAC company leader and sustainability architect

Build out remaining customer engagement plan

3) Operational Scalability

Invest in scaling production capabilities efficiently to reduce costs and increase market competitiveness. It must leverage the first-mover advantage and carve out an operational MOAT across all the verticals of the supply-chain

1) Intellectual Property Fortification

Ensure protection of intellectual property to secure market position and innovation advantage. Patenting their unique manufacturing processes will allow Plantd to deter competitors from replication. This strategic focus on IP not only fortifies Plantd's competitive edge but also underpins its long-term growth and industry leadership.

Comparing Leading Contenders

		plantd \$ Build the future.
Team Size, Reputation, History	Founder has background in sustainable agriculture, well developed diverse team	Founders are ex-SpaceX
Green Impact	Impact is created when replacing meat products (not when replacing with other meat substitutes)	Impact is created by reducing vast tree cover cutting, third party verification
Product Stage	Bosque has tested the product and is launching their product in H2 2024 (Gate 4: Validation and Testing)	Plantd has created a product but has not yet finalized their supply chain (Gate 3: Detailed Design)
Funding Stage	Seed round secured in May 2022 (\$4m)	Series A round secured in Jan 2023 (\$10m)
Technology Novelty	Three non-provisional patents filed	Technology is proprietary, first mover advantage
Probability of Success	20 LOIs signed (Annual recurring revenue potential of \$900k)	Partnership with biggest homebuilder in U.S.
Biggest Risks	Alternative meat sales declining trends, lack of brand recognition to develop B2B market, competition	Green premium, technology defensibility, deeply embedded traditional supply chains
Potential Market Size	~\$78m	\$30m-\$130m

FURNITURE

Sustainability in action:

 Biodiversity assessment in forests to improve outcomes

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Incentives/Goals:

 Removal and storage of carbon in agri. and forestry

COMMODITY: Grow and harvest raw material Incentives/Goals:

glue

 Reduce carbon emissions of materials by 50% by 2030 (from 2016)

Sustainability in action:
Increasing recycled content in fiberboard
Introducing bio-based

 Increase of renewable electricity at production units

External partnerships:

- 800 home furnishing supplier relationships
- Increase of renewable electricity at production units

PROCESSIN

G:

Convert raw material into panel

External partnerships:

- 800 home furnishing supplier relationships
- Increase of renewable electricity at production units

REPACKAGI NG: Assemble panel into

INTERMEDIA RY: Design and sell furniture to end user

For IKEA, no intermediary

Sustainability in action:

- End products increasingly conducive to circularity
- Increasing renewable electricity at retail units

Incentives:

 Adequate data-backed marketing of sustainability visible to end-user

END-USER

Data based on IKEA climate report

HOMEBUILDING



Open question: cost-benefit between storage + higher margins at distribution, and low storage needs + low margins at processing level