

2026 Summit Proceedings

Bio-Based Materials Collective



MASS.

About the Summit

Over two days in May, the Bio-Based Materials Collective gathered in the Hudson Valley bioregion, and specifically in Poughkeepsie, New York for the 2026 Summit. More than 150 participants from across the built environment ecosystem came together - architects, engineers, builders, consultants, academics, farmers, manufacturers, foresters, government officials, researchers, investors, and students. The diversity of voices and perspectives underscored the holistic and collaborative nature of this work.

Each BBMC Summit serves as a living model for discovering and advancing regional, bio-based material ecosystems. A foundational goal of these gatherings is to cultivate and strengthen relationships across the network, while practicing together in a specific location. By exploring the market, policy, cultural and environmental forces shaping the use of bio-based building materials, the community uncovers specific regional barriers and opportunities. Through learning, collective problem solving and relationship building the local partners are empowered to scale up the use of bio-based building materials long after the Summit concludes. Ultimately, this framework for collaborative action, rooted in local ecosystems yet connected continentally, is designed to be replicated across diverse regions, establishing a scalable practice for bio-materials ecosystems.

Field to Form Tour

On our first day, 80 participants toured Dutchess and Columbia County's bio-based materials landscape - from field to form. The tour showcased real-world examples of regional material cultivation, processing, and buildings. Participants engaged directly with farmers, manufacturers, and builders who are trailblazing these practices, learning about their methods and businesses in order to become better partners. Twenty people from the Bauhaus Earth Transatlantic Frontrunners Programme participated in the tour; all leaders from cities in the Northeast US and Germany.

Stone Grain Farm

Hudson, NY

Stone House Grain, our first stop, is a 2,000-acre, Regenerative Organic Certified farm and feed mill dedicated to producing premium, non-GMO, organic, and soy-free animal feeds completely free of antibiotics and hormones. Since transitioning to organic farming over a decade ago - weathering an initial phase where synthetic chemicals cleared from the ecosystem and managers adapted to the land's shifting needs - the farm has prioritised continuous living cover crops and a dynamic four-to-five-year rotation of wheat, clover, soy, and corn. This regenerative approach, which currently hosts on-site Cornell University no-till trials, has successfully kept soil carbon levels steady or increasing over the past five years. The farm's holistic philosophy extends to its commercial partnerships, such as supplying wheat straw to Build With Nature for sustainable construction. While selling the straw strategically boosts the wheat crop's value from approximately \$600 to \$1,000 per acre, it requires a careful ecological balancing act, as management must reinvest in organic soil amendments or specialized cover crops to replace the vital nutrients that leave the farm ecosystem.



BBMC

Authored by

MASS.



Wally Farms **Ancram, NY**

Wally Farms is a 1,000-acre working landscape and agricultural incubator. Driven by a mission to envision and create a climate-resilient world, the farm acts as a living laboratory for technological innovation and regenerative farming practices.

The initiative supports a Farm Entrepreneur Accelerator Program and is pioneering a unique steward-ownership model. Alongside its agricultural endeavors, Wally Farms offers sustainable short-term accommodations, including some of the first hempcrete cabins in the Northeast, and functions as a community venue for events, educational workshops, and retreats centered on ecological stewardship. Our tour started at the beautifully crafted hempcrete tiny-home cabins¹ designed by youarethecity and supported by Hempstone. Other spots on the walking tour included silvopasture fields, a woodland mushroom yard, and newly planted foraging forest. The experimental sorghum planting by Carbon Sponge project excited the building material focused audience because it resembled hemp in many ways with its long fibrous stalks. Our final stop was the recently installed saw mill that will be used to mill trees on site for future onsite construction projects.



¹ The Wally Farm Hempcrete cabins are documented as a case study in the Bio- & Mineral-Based Materials Primer, which can be found at biobasedcollective.org/resources





Spring Wind Farm Germantown, NY

From field to form, we visited the Zen Buddhist Temple at Spring Wind Farm. It is a 10,000 ft² off-grid retreat center consisting of two buildings. The project was designed by architect Kevin Baxter and built by Build With Nature. The Sangha House is an integral part of the temple's vision for a rural agrarian retreat center serving its members. The buildings were constructed using the highly energy-efficient EcoCocon straw panel system, creating healthy, comfortable, sustainable, and exceptionally energy-efficient spaces.



Material Petting Zoo

We set up the Material Petting Zoo at Scenic Hudson's Northside Hub. The petting zoo allows people to experience the materials we talk about close up because their feel and smell clearly differentiate them from synthetic alternatives.



BBMC

Authored by

MASS.



Knowledge Exchange

The second day brought 150 attendees to Scenic Hudson's Northside Hub in Poughkeepsie, NY, for a day of shared learning and progress. In the morning, we heard from 13 local, regional, and national organizations across the critical domains of design, manufacturing, finance, education, and culture. These presentations helped broaden our collective understanding of how different parts of the material ecosystem can be directly or indirectly applied to scale up the use of bio-based building materials; and each of our prospective roles in that work

The Northside Hub is a regional model of adaptively reused industrial space, demonstrating what is possible with regional resources.

Many of the presentations can be downloaded at biobasedcollective.org/convenings.

Seth McKee, Scenic Hudson

Seth outlined Scenic Hudson's mission to protect and enhance the Hudson Valley's natural beauty and public health. Birthed from the historic Storm King Mountain campaign, the organization has conserved over 53,000 acres of land, created more than 65 parks, and protected 22,000 agricultural acres. Through a three-part approach of lands, communities, and advocacy, the group highlights its history of holding polluters accountable, transforming industrial waterfronts into public spaces, and building urban infrastructure like trails and community farms to foster inclusive access to nature.



Evan Pritchard, Center for Algonquin Culture

Evan explored pre-1700 Native architecture and geography in Uppuqui-ipis-ing (Poughkeepsie, NY) and explained that the city's name stems from an architectural reference to a "safe sheltered spring". The presentation detailed indigenous biomaterials - including elm bark, cedar saplings, and reeds - used to construct traditional wigwams, highlighting the sacred geometry of the Six Pointed Star Lodge. Evan also presented maps of regional Algonquin territories and trails, linking local waterways to historical landmarks, a 1696 land deed, and the Hyde Park mastodon site.

**Justin Brown, MASS**

Justin presented the story of Scenic Hudson's Northside Hub - the Summit venue - a climate-positive adaptive reuse of a historic factory operating within ecological and social boundaries. The net-zero energy design limits embodied carbon to 121 kgCO₂e/m² and fully offsets emissions using renewable energy provided to the grid. The architecture preserves the original masonry structure, incorporates repurposed structural wood, and utilizes a high-performance envelope with passive HVAC strategies. Furthermore, the site integrates local brownfield remediation and advanced bioswales to champion regional bio-based material adoption. At the end, Justin asks, "learning from adaptive reuse, what incentives and regulations could we put in place to accelerate bio-based building adoption?"

**Sarah Davidson, NY Green Bank**

NY Green Bank (NYGB) is the nation's largest state green bank, filling clean energy financing gaps with typical investments of \$5-50 million. Through December 2025, NYGB committed over \$2.6 billion and mobilized \$10 billion across 156 transactions, avoiding 50 million metric tons of CO₂e. Notably, 50% of capital has benefited disadvantaged communities. To qualify, proposals must prove economic feasibility and greenhouse gas reduction potential through a formal, committee-led evaluation process.



Nyla Mabro and Lovinia Reynolds, The Clean Fight

The Clean Fight New York designs targeted programs to accelerate the adoption of proven climate solutions. To date, they have supported 70+ decarbonization companies, securing \$800 million in follow-on funding, \$5.4 million in grants, and over 5,000 state project deployments. Backed by a deep network of real estate, capital, and technical partners, their initiatives primarily focus on building decarbonization and energy storage. The organization is currently introducing a \$750,000 grant pool to deploy market-ready, bio-based solutions across five scalable multifamily housing projects.

**Gizem Karagoz, NYCEDC**

Gizem presented NYCEDC's strategy for climate innovation in the built environment. Managing a \$9B capital budget and 64 million square feet of real estate, the organization aligns with PlaNYC's target of a 50% embodied carbon reduction by 2033. New York City's green economy is projected to reach 400,000 jobs by 2040, led significantly by building decarbonization. To scale sustainable solutions, NYCEDC provides real-world testing through "Pilots at BAT" and is developing advanced innovation hubs, including BATWorks in 2028 and Gotham Foundry in 2030.

**Misael Gerardo-Montas, SEAmarron Farmstead LLC & Bantu Green Solutions**

Established in 2020, SEAmarron Farmstead is a BIPOC-led regional bioeconomy project based in Danbury, Connecticut, focusing on industrial hemp production. The cooperative addresses supply volatility and industry inequities by empowering historically underserved farmers through local processing hubs and training centers. Their phased 10-year growth strategy targets expansion from 20 to 100 acres, scaling from animal bedding and building hurd to advanced hempcrete and fiber products. Supported by current investors like the Black Farmer Fund, the venture projects a 79.8% average gross margin with a Year 4 break-even point.



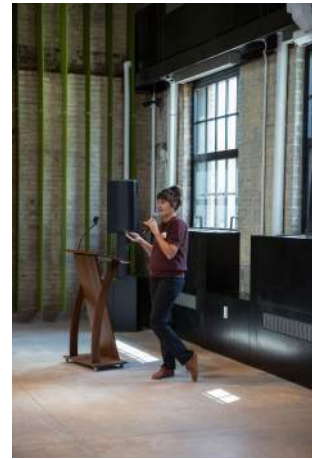
BBMC

Authored by

MASS.

Emily Majewski, Cast Carbon

Cast Carbon is a Hudson Valley, New York-based manufacturer of carbon-negative, agroecological wall tiles. The venture targets commercial interior fit-outs, which can generate 350% more lifetime carbon emissions than a building's core and shell structure. Made from a zero-waste, compostable blend of forestry biochar, pure binding minerals, and regional agricultural byproducts, the tiles are fully commercialized. Cast Carbon integrates local manufacturing, installation, and reclamation to provide certified, greenwashing-proof solutions.



Greg Wilson, HempWood

Since 2018, HempWood has manufactured plant-based, carbon-negative building materials to resolve Sick House Syndrome and reduce the built environment's carbon emissions. Using a zero-waste process, the company produces hardwood flooring, structural materials, cabinets, and tabletops distributed across six continents for major clients including HGTV, BMW, and Chipotle. Supported by two patents, their products have stored 8,200 tons of carbon and generated 77 jobs. Named Kentucky's fastest-growing manufacturer in 2024, HempWood effectively bridges eco-friendly validation with modern construction practices.



John Loercher, Northeast Projects

John presented the Kite's Nest Regeneration Project in Hudson, NY. This initiative transforms a former industrial waterfront into a youth-led, 2-acre ecological campus centered on community resilience and urban land stewardship. Driven by values of equity, collaboration, and carbon sequestration, the design implements prioritized, carbon-smart architectural decisions. High-impact sustainable elements featured in the design include a prefabricated straw bale system, a mass timber superstructure, wood fiber roof insulation, low-embodied-carbon concrete, and reclaimed materials.



Paul Lewis, LTL Architects

Paul presented "Straw Tectonics," an exploration of biogenic housing. Based on their book, *Manual of Biogenic House Sections*, the research demonstrates how plant-based, low-carbon materials like straw, hemp, and mass timber can rethink residential architecture. LTL showcased two New York projects currently under construction: the stick-framed Ruth Straw House in Ithaca and an All Straw House near Hudson. Partially funded by Princeton University, their work tests structural assemblies utilizing Durra Panels, Lignoloc fasteners, and harvested Phragmites thatch.



Marta H. Wisniewska, Cornell AAP & ReAL

Marta addressed the construction sector's heavy impact, which generates 39% of global carbon emissions and 35% of landfill waste. To provide sustainable alternatives, REAL investigates biogenic building materials for local applications. Key research highlights feature structural straw modules designed with ETH Zürich's Sustainable Emerging City Unit, architectural soil installations ("Terra Firma: NewGrounds"), and structural mycelium testing ("MycosShell"). Marta communicates these circular practices through public exhibitions and Cornell AAP's Healthy Building Materials elective.

**Mary Lambert, Garrison Institute**

Mary presented a strategy addressing climate threats and compounded impacts in the Mid-Hudson Region. The initiative targets key regional vulnerabilities, including food insecurity, housing affordability, mental health, and childcare access. Through its Bioregional Resilience Program, the institute coordinates contemplative convenings, climate mapping, frontline community engagement, regenerative farming, and emergency preparedness. A central milestone involves collaboratively building adaptive capacity through local Resilience Hubs that integrate physical infrastructure, backup power systems, and community services.

**BBMC**

Authorized by

MASS.

Collective Intelligence

The quickest and most effective approach to achieving tangible action beyond the Summit is to act through the people already doing the work - the members of the Collective - by supporting them with the Collective Intelligence of the BBMC.

Prior to the Summit, attendees submitted proposals to host a 50 minute long engagement session that would benefit their work and the industry in scaling up the use of bio-based building materials. The eleven selected submissions ran concurrently and were repeated twice in the afternoon. This meant the 150 attendees were able to attend two sessions.

The sessions are briefly described below and are captured in significant detail in the appendix.

Hudson Valley Housing Conversation

Led by:

David Todd, aester

Jared Spears, Hudson Valley Regenerative Housing

This session explored addressing housing affordability through a bioregional development lens. Participants discussed biobased materials, social finance, cooperatives, panelisation, prefabrication, local manufacturing, and tying affordable housing subsidies to health metrics to incentivize non-toxic building.

Regenerative Financing for Bioregional BioBased Material Supply Chains

Led by:

Zbigniew Grabowski, Full Circle Design Consulting

Sarah Davidson, NY Green Bank

Focused on green financing and embodied carbon standards, this workshop addressed how bioregional finance can build biobased material supply chains. Participants identified funding opportunities to support biobased materials across their lifecycles, proposed aligning green banks with embodied carbon standards, and emphasized the need for education around toxicity and climate impacts of dominant building modalities to build public support and momentum for biobased material market penetration.

Fungal Foundations: Exploring Mycelium as a Building Material

Led by:

Marta H. Wisniewska, Cornell University, Architecture Department

This workshop introduced mycelium-bound composites as circular, low-carbon building alternatives. Through presentations and speculative design exercises, participants explored fabrication workflows, structural limitations, and future applications like high-performance acoustic insulation and biodegradable formworks using agricultural waste streams.

What Would Convince You? - Ranking the Evidence That Moves Bio-Material Decisions

Led by:

Arta Yazdanseta, RPI

This self-guided session evaluated how professionals weigh evidence for biomaterial construction using the Habitat Atlas. Participants ranked priorities, converging heavily on health and thermal performance over simple cost metrics, emphasizing the need for workforce training and citable performance benchmarks.



Collective Liberation: Relationship to Each Other

Led by:

Ace McArleton, New Frameworks & Seed Collaborative

Haley Hardwick-Witman, Co-everything

Grounded in active embodiment exercises, this dialogue focused on recognizing systems of oppression and dismantling supremacy within the bio-based building movement. Outcomes highlighted building empathetic communities, sharing power, using inclusive language, and implementing daily on-site practices to foster equity and collaboration.

Program Co-Design: Investing in Scaling Bio-Based Solutions in NYS

Led by:

Nyla Mabro, The Clean Fight

Thatcher Bell, The Clean Fight

Lovinia Reynolds, The Clean Fight

This interactive workshop co-designed a program to accelerate New York's bio-based ecosystem. Participants identified adoption barriers like liability and builder learning curves, recommending strategies like targeting multifamily buildings, utilizing building certifications, and funding high-impact needs like product certifications.

What a Campus Could Hold - Rooting BBMC's Work in Place and Bioregion

Led by:

Nicholas Salmons, Regenerative Pathways

David Fulton, Wild.Build and Treehouse.Coach

Facilitators hosted a World Café discussion exploring a shared physical campus in Chatham, NY, to anchor the Hudson Valley bioregion. Participants emphasized long-term stewardship over rigid master planning, proposing ideas like material distribution spaces, agroforestry trails, academic prototyping, and cooperative governance models.

From Field to Building: Envisioning a Regional Bio-Based Demonstration Campus

Led by:

Julie Stinar, ENaBL- Evensong Natural Building Lab

This session focused on ENaBL's concept for a Maryland farm-based demonstration campus. Participants brainstormed funding partnerships with federal agencies and regional material testing - including straw, hemp, and mycelium - envisioning a living laboratory with identical buildings for comparative performance studies.

Standardizing Carbon and PCR Frameworks for Hemp-Based Materials

Led by:

Caroline Dunn, BIOBUILD

This technical session addressed the flaws of applying standard Environmental Product Declarations (EPDs) to natural agricultural materials. Participants discussed aligning Product Category Rules (PCRs) across the biofiber sector, improving end-of-life accounting, and adapting standards to the inherent variability of plant-based products.

Bio-Based Materials in Multifamily Housing Building Envelopes

Led by:

Brian Sandford, Studio G



BBMC

Authored by

MASS.

This interactive design charrette gathered feedback for an upcoming guide on maximizing bio-based envelope materials in mid-rise multifamily buildings. Discussions focused on bridging the gap between single-family strategies and larger scales, particularly by addressing market barriers regarding cost and perceived risk.

Bio-Resilience Hubs

Led by:

Mary Lambert, Garrison Institute

Billy Craig, BC Productions

Participants reimagined community resilience hubs as inclusive, bio-based gathering spaces rather than just emergency shelters. Discussions emphasized leveraging trusted entities like libraries and schools to provide resource-sharing, educational programming, and circularity-themed resources, highlighting that bio-based buildings are inherently more thermally resilient.



Thank you

The 2026 Summit was primarily organised by Billy Craig, James Kitchin and a host of supporters, namely: Ace McArelton Jacob Deva Racusin, Zbigniew Grabowski, Peter Jensen, David Todd, Kaja Khuel, and Sara Kudra.

We are very grateful to Scenic Hudson for sharing their beautiful community space at the Northside Hub with us, and we are grateful to our fiscal sponsors for their support.



Appendix A - Session Report Backs

Hudson Valley Housing Conversation

Led by

David Todd, aester

Jared Spears, Hudson Valley Regenerative Housing

Session Description

Conventional approaches to the housing crisis aren't working. How can biomaterial building and local resource economies be activated as part of a living systems alternative to our region's acute housing cost burden?

This session invites us to approach the problem of housing affordability through a whole systems lens. Using the Hudson valley as a case study, we'll consider what it means to address housing cost burdens through a bioregional development lens, including not just ecological materials and prefabrication methods, but also social finance, cooperatives and self-help, and alternative approaches to land tenure.

Report Back

2 conversations, 2 different exploratory, emergent and divergent threads.

In the first conversation, we had about 7 of us circling questions of what enables biobased materials to enter the affordable housing space. This group was made up of architects and higher ed teachers or architecture and interior design. The primary take-aways from our first conversation centered around panelization, prefabrication, and locating manufacturing in the region. With educators in the group, they explored the idea of giving students a rural affordable housing challenge as a thesis project.

In the second conversation, we had about 12 people participate. This group consisted of higher ed students and educators, architects, non-profit housing orgs, farmer housing specialists, alternative business model strategists, and real estate developers. This group explored the relationship between farms and housing, cooperative housing development models (coops, Baugruppen, etc.), and considered tying affordable housing subsidies to health and wellness metrics to incentivize adoption of non-toxic, biobased materials in affordable housing projects.



BBMC

Authored by

MASS.

2026 Summit Proceedings

Regenerative Financing for Bioregional BioBased Material Supply Chains

Led by

Zbigniew Grabowski, Full Circle Design Consulting
Sarah Davidson, NY Green Bank

Session Description

Across the country, interest in green banks, embodied carbon standards, emerging carbon markets, and regenerative finance is growing. Guided by the overarching question - 'How can bioregional finance facilities create biobased materials supply chains?' - this workshop harnesses the momentum of interest in regenerative finance and embodied carbon policies to:

- Identify existing mechanisms for financing different aspects of Biobased material supply chains using specific projects and materials as a starting point.
- Collectively identify what challenges we have encountered when seeking supply chain or project financing, and how we might overcome them.
- Identify specific interventions to address challenges and build the supply chains we want and need.

Report Back

In our two sessions we focused on our energies on the current state and issues facing the financing of bioregional biobased material supply chains. Our first session focused on the larger NE bioregion and the second focused on NY state. Using a matrix format, we trialed two different formats for tapping into our collective knowledge, to describe the current state, challenges, opportunities across the biobased materials lifecycle, segmented by cultivation, processing and manufacturing, design/build, operations and maintenance, and end of life.

Our first session had approximately 8 people, including the facilitators. Six provided contact info to stay in touch regarding the potential of a bioregional financing working group - including James Kitchin, Echo Allen, Savannah Strenz, Peter Hussey, Sarah Bayer, Luke Lombardi, and Michael Hindle. This was heavily represented by members of the design build community.

The second session had nine participants, of a slightly more diverse mix of cultivators/processors/manufacturers, and the design/build and research communities, namely Marta Wisniewska, Sally Warren, Misael Gerardo-Montas, Jeff Gagnon, Annie Bevan, Alban Denic, and Michael Salvato.

We identified shared challenges and opportunities for scaling up financing of biobased materials, many of which are cross cutting across the entirety of the supply chain as well as specific near term priority interventions to accelerate the biobased transition.

Overarching findings: All participants agreed that there is rising demand for biobased materials despite bottlenecks in the R+D ecosystem largely driven by the high costs of certification and code compliance, requiring investment in reference cases and demonstration projects and present need for philanthropic and public funding for proof of concept grants. there are few, if any, biobased 'platforms' operating in the industry today - or standardized and widely adopted building approaches that utilize only climate positive materials - and the development of panelization and standardization



BBMC

Authored by

MASS.

2026 Summit Proceedings

of biobased assemblies is seen as a primary solution to this challenge. It is clear that materials that can integrate into current mass market building solutions, e.g. stick framing and mass timber, can scale rapidly within the market. Public education around the toxicity and climate impacts of many currently used materials is still a fundamental and overarching need to build the market for healthy high performance alternatives, as is the need to regulate materials with negative health and climate impacts. It was generally agreed that the current funding model will focus on the highest first order yields, rather than examining systemic costs and benefits, and if cheap and toxic materials are permissible they will continue to benefit from a skewed market advantage.

The same goes for cultivation of traditional or emergent biobased material feedstocks and regenerative agriculture more generally (currently less than 3% of crop land is certified organic). It is clear that frontrunner states are blending federal and state funds (e.g. USDA NIFA, SARE, NYSEERDA, Cornell Bio-economy program) and bioregional/local technical knowledge are making headway in developing supply chains via field testing locally appropriate crop varieties. However processing infrastructure remains challenging to fund, as it often falls outside of USDA funding scopes, and is seen as too low a return/risky by typical venture capital and incubator funds.

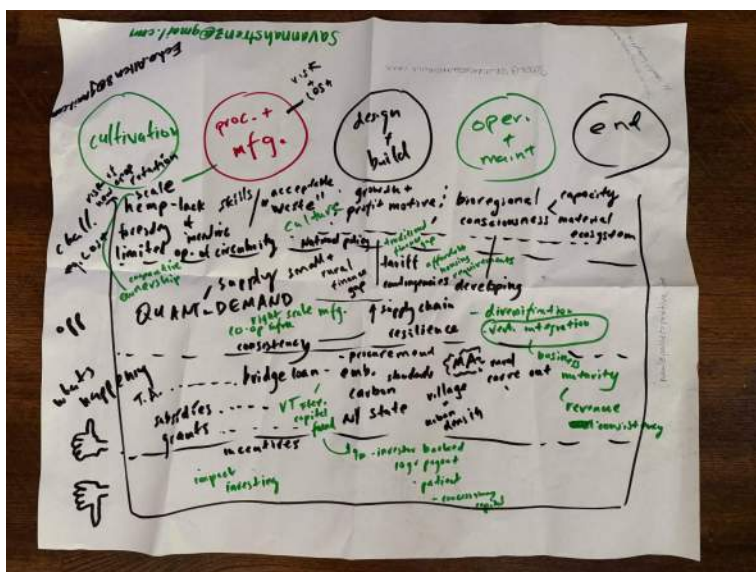
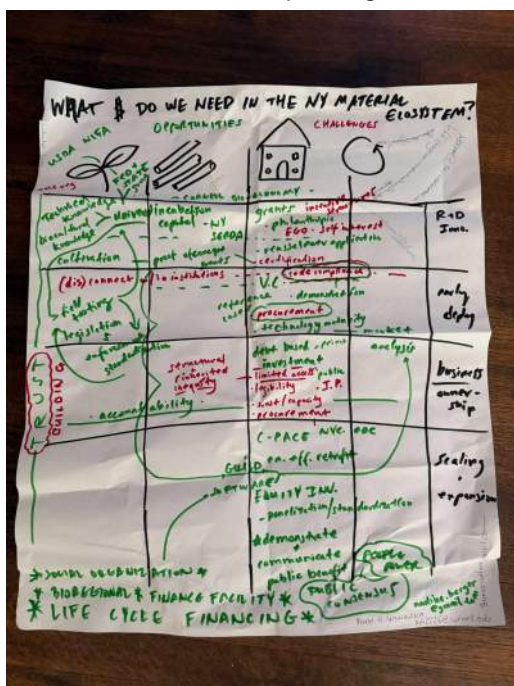
Key Proposed Interventions resulting from these sessions:

- 1) **Green banks and embodied carbon standards for high performance buildings.** One nationwide solution to this dilemma could come from aligning Greenbank programs with the goals of a climate positive biobased materials supply shift by adopting an embodied carbon standard for materials funded via c-pace or other incentive programs for high performance energy retrofits. Leveraging the existing work of Builders for Climate Action, RMI, and others on the carbon intensity of different building assemblies, the BBMC could make a clear case for how 'climate oriented' state supported green financing should logically consistent in adopting a lifecycle embodied carbon based approach when financing energy retrofits. This would support both shorter supply chains (less scope III emissions), discourage high carbon intensity materials (e.g. spray foam), and provide a financing premium for carbon negative materials.
- 2) **Continuing to engage in financing coordination across sectors at a bioregional scale.** There remains a need for structured collaborative thinking to identify how promising approaches, such as partners for climate action in the Hudson Valley, can align their housing and agricultural programs to grow and utilize bioregional feedstock materials.
- 3) **Buildings as Medicine, Trust in Biobased.** There remains an overarching need to develop and communicating the value proposition of BBM vis a vis the toxic and climate destroying BAU. Much of our conversation hinged upon the notion of trust, and public trust, trust in institutions, trust of farmers, trust of specifiers/designers and it is clear that if more of the public is aware that they cannot trust dominant institutions to protect their health and climate, the more pressure there will be for solutions - if BBM are to scale they must consistently communicate about both the downsides of toxic materials and the upsides of moving to a biobased platform.
- 4) **Developing and communicating lifecycle MMRV tools.** There is also a need for shared measuring, monitoring, reporting, and verification infrastructure for agricultural practices and deployment of BBM, which could be a good project of the BBMC given that several high profile members have developed tools for lifecycle analysis. This would support goals 1-3 above as it would be useful to identify regional appropriate crops and forest products to turn into BBM and their potential for carbon sequestration at regional and global scales in a transparent and credible fashion. These tools should integrate lifecycle costs savings of

building operations to build the value case for building owners and operators, including demolition (composting) costs.

5) Developing specific business cases. As material and energy costs continue to rise dramatically, regionally and locally produced BBM are approaching if not exceeding cost parity with fossil fuel based materials, especially when considered over building lifecycles and including operations and maintenance (at least for durable and high performance assemblies).

Taken together these interventions will build the overall market for BBM, and a working group to track their implementation and generate other ideas for policy intervention and novel financial models (e.g trust and commitment pooling within confederated coops), could be a vehicle to move forward.



Fungal Foundations: Exploring Mycelium as a Building Material

Led by

Marta H. Wisniewska, Cornell University, Architecture Department

Session Description

Global material demand is projected to more than double by 2060, with the construction sector accounting for nearly one-third of this increase. Addressing this challenge requires a fundamental shift from a linear “take–make–dispose” economy toward a circular, regenerative material paradigm that integrates biological processes and minimizes waste. "Fungal Foundations: Exploring Mycelium as a Building Material" investigates mycelium-bound composites as sustainable, bio-based alternatives for architectural applications.

Report Back

What we did

This short workshop introduced participants to the emerging field of mycelium-based building materials through a mix of presentations, material demonstrations and speculative design exercises. We began by discussing the environmental impacts of conventional construction materials and the growing need for renewable, low-carbon alternatives. From there, participants were then introduced to the biological properties of mycelium and its potential applications in architecture, product design, and construction.

During the session, attendees learned about the process of creating mycelium-bound composites (MBCs) using agricultural waste substrates and fungal inoculation techniques. The presentation covered different stages of fabrication, including substrate preparation, mold fabrication, growth processes, and curing methods used to produce lightweight bio-based components. Participants also took part in a short speculative design exercise, where they were encouraged to creatively imagine mycelium materials as substitutes for conventional commercial materials and building elements through sketching and diagramming. This opened up broader conversation about material performance, scalability, structural limitations, biodegradability, and it might mean to integrate living systems into the built environment.

Who attended

This workshop was attended by six participants, including students, researchers, architects, designers, and other professionals interested in sustainable construction and biomaterials, most of whom had little to no prior experience working with mycelium materials. The interdisciplinary mix of backgrounds created an engaging environment for discussion and exchange across design, engineering, and environmental sciences.

Main outcomes

One of the main outcomes of the workshop was a greater awareness and understanding of mycelium as a viable bio-based material system. Participants hopefully gained a clearer sense of the fabrication workflow, as well as the opportunities and challenges, and limitations associated with working with living materials. The demonstration of various mycelium modules during the session encouraged experimentation and sparked conversations about future applications ranging from thermal and acoustic insulating systems with higher performance and aesthetic value, to temporary exterior and



BBMC

Authored by

MASS.

2026 Summit Proceedings

interior installations with assembly logic embedded, and biodegradable formworks, including coffins—reinforcing ideas about circularity and reconnecting our practices with ecology. Another important outcome was the creation of new connections between participants interested in circular design and regenerative construction practices. The workshop fostered interdisciplinary dialogue and highlighted the importance of integrating biological thinking into architectural education and research. Several attendees expressed interest in continuing experimentation, collaborative research, and material testing following the session.

More broadly, the workshop contributed to ongoing discussions about the future of sustainable construction by demonstrating how agricultural waste streams can be transformed into high-value building materials through low-energy biological processes. By emphasizing locally sourced mushroom strains and substrates, biodegradability, and carbon-conscious fabrication, the session illustrated pathways toward reducing the environmental footprint of the built environment.

Potential wider bio-based material industry benefits

These kinds of workshops benefit the broader bio-based building materials industry by expanding awareness, technical literacy, and public engagement around emerging fungal biomaterials. As the field continues to evolve, educational and experimental sessions like this help bridge the gap between research and practice, encourage innovation and support the development of the regenerative materials ecosystem. This short workshop also served as a showcase and teaser of the much more intense and deliberate hands-on experimentation, research and fabrication within educational institutions, where students engage more deeply with bio-based materials over the course of a semester or a full academic year. The workshop additionally underscored the importance of interdisciplinary collaboration in preparing the next generation of designers, material researchers and builders to work with the wealthy catalogue of bio-based solutions.

Photos by Marta H. Wisniewska





What Would Convince You? — Ranking the Evidence That Moves Bio-Material Decisions

Led by

Arta Yazdanseta, RPI

BACKGROUND

People already trust this kind of evidence everywhere else. Before booking an Airbnb or buying almost anything online, we scroll past the listing to the reviews, because how a place actually performed for the people who used it is what decides the choice. For one of the largest and longest-lived decisions anyone makes, what to build a building out of, that review layer does not exist.

The gap is measurable. In a systematic review I co-authored of 309 hempcrete publications from 2004 to 2024 (Yazdanseta & Mi, 2025), material characterization filled 78.9% of the literature while social and occupant dimensions accounted for just 2.92%. Hemp-lime is well proven in the laboratory and almost unstudied in the homes people actually live in. Lacking that evidence, the builders, owners, developers, lenders, and policymakers who decide whether these projects happen fall back on cost and energy proxies that misstate both the risk and the value of building this way.

The Habitat Atlas closes that gap. It is the review layer for biomaterial buildings: it turns long-term occupant experience into a queryable decision tool that shows each stakeholder the evidence relevant to their own decisions, with a public MVP planned for summer 2027. An eight-household European pilot has already shown the method produces decision-grade findings, including unanimous re-choice and measurable respiratory improvement among occupants.

The Summit was a chance to pre-validate the Atlas decision layer with the exact professionals the tool is meant to serve, before the platform is built. I used it to answer two questions: whether the framework reads clearly to a working professional seeing it cold, and how different decision-makers weight the same building. Both feed directly into the next iteration of the platform and the next round of occupant interviews.

WHAT I DID

I ran a self-guided station built around a wall-mounted Atlas, which set out the full framework of eight categories and twenty-five subcategories, and two short paper activities.



BBMC

Authored by

MASS.

2026 Summit Proceedings



First Activity - Selecting what matters to each stakeholder

The first activity moved through three steps. Working alone, each participant identified their role with a colored dot and circled the five subcategories that weigh most on their own decisions. They then talked those choices over at a table of mixed roles, guided by a prompt asking what the framework was missing for someone in their seat: a category, a question worth putting to future occupants, or a filter they would apply to the data. That discussion did two jobs. It gave people time to test their own picks against other perspectives, which tends to sharpen judgment and surface a more considered answer than a silent form would on its own. And it primed the final step, where each participant wrote down what they felt was missing, along with any other feedback they wanted to leave. The circled selections produced the count data on the Stakeholder Priorities Diagram; the written notes produced the qualitative comments analyzed alongside it.

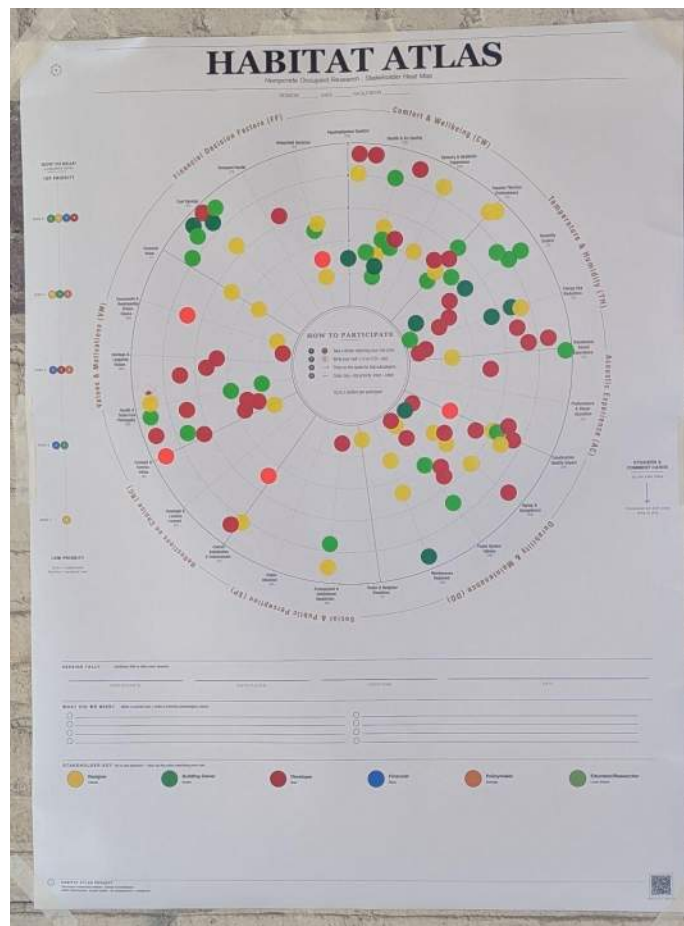


BBMC

Authorized by

MASS.

2026 Summit Proceedings



Second Activity - Ranking what matters to each stakeholder

In the second activity, participants placed five role-colored stickers on a large wheel and signaled intensity by how far toward the rim each one sat, from one at the center to five at the edge; this produced the rank-weighted data on the Rank-Weighted Priority Analysis sheet. The two methods were run together by design: a circle records that something matters, a high sticker records how much, and where the two diverge became a finding in its own right.

WHO TOOK PART

Roughly twenty participants took part. Reading roles back from the dot and sticker colors, the room was about seven builders, installers, and manufacturers; six practitioners and consultants; five educators and researchers; one to two prospective building owners; and one policymaker. The count activity recorded 20 participants and 100 selections; the wheel recorded 101 stickers from a comparable group that included two building owners. No one took the developer or financier seat in either activity. These headcounts are inferred from colors, so read them as close estimates, though the absence of money-side stakeholders is unmistakable.





WHAT THE ROOM SAID

Three results matter most for the next version of the tool. The people who came converge on health and thermal performance, they diverge almost everywhere else, and the priorities that actually drive their decisions are not the ones a simple headcount would surface. A fourth result is structural, and it is about who did not show up.

Thermal performance and health are the shared ground. Temperature & Humidity is the top category on the Rank-Weighted sheet (Categories by priority: TH 53, ahead of DM 51 and VM 49) and the



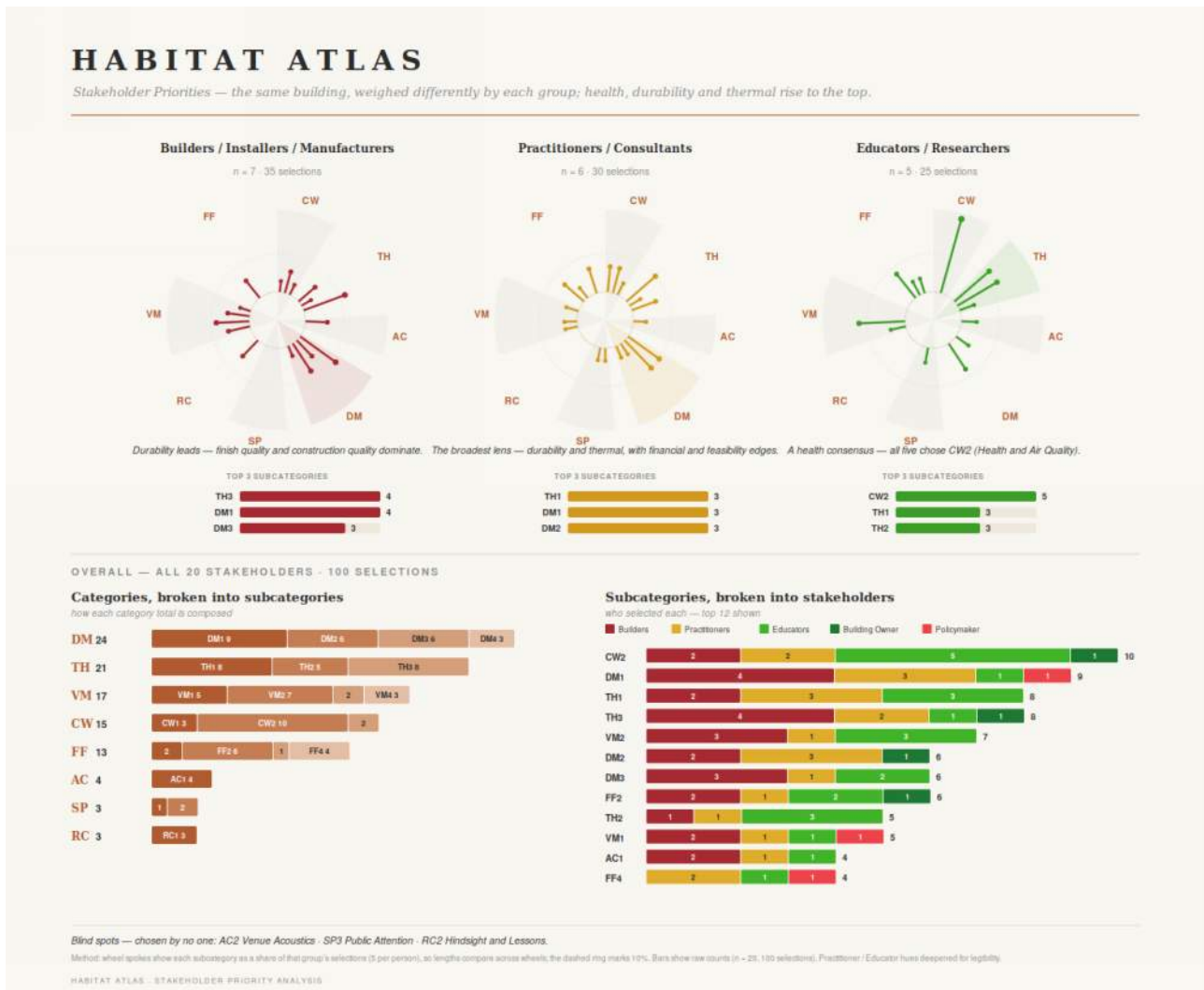
BBMC

Authorized by

MASS.

2026 Summit Proceedings

second-highest by count on the Stakeholder Priorities Diagram (Categories, broken into subcategories: DM 24, TH 21). Health & Air Quality is the single most-selected subcategory by count (Subcategories, broken into stakeholders: CW2, 10 selections) and the highest-scoring by rank-weight (Subcategories by stakeholder: CW2, 27). Every educator and researcher chose it, and it tops the builder group on the rank-weighted sheet. For educators, humidity sits right alongside health at the top, so the convergence reads as a health-and-thermal cluster that holds even across groups that disagree on much else.



First Activity - results and findings

The same building looks different through each lens, which is the premise the Atlas is built on, and the radar profiles at the top of the Rank-Weighted sheet show it directly. Builders spread their attention widest and lean on durability, craft quality, and ecological values. Practitioners give the flattest profile of any group, with thermal comfort sharing the front with cost and feasibility. Educators cluster tightly on health and humidity. The two building owners cared most about what the building costs to run and



maintain, and the single policymaker led with ecological ethics, though both of those readings rest on one or two voices.

Priority is not the same as frequency, and the cost finding is where that matters most. Cost Savings is middling when you count picks (FF2, 6 selections, under Subcategories, broken into stakeholders) but jumps to second overall when you weight by intensity (Subcategories by stakeholder: FF2, 26), because a small number of people, weighted toward the building owners, placed it at the very top of their wheel. Energy Use Reduction runs the opposite way: many selected it (TH3, 8 selections, same panel) but it carried far less weight than its frequency suggested (17, mid-pack on Subcategories by stakeholder), a welcome bonus rather than a deciding factor. A tool that ranked priorities by how often they were chosen would get both of these wrong.

The framework itself held up. Participants placed themselves in the taxonomy without coaching, and what they asked for were additions, not repairs. Three subcategories drew nothing from anyone in either activity: Performance & Venue Acoustics, Public Attention, and Hindsight & Lessons Learned, which the Rank-Weighted sheet lists under "Chosen by no one." The whole social-perception and reflections wedge of the wheel stayed nearly bare. The written comments, on the other hand, named gaps that fit the Atlas method and recurred across participants: what these buildings cost to live in over time, how disruptive the build and move-in are, and what happens at the end of a building's life, with accessibility and aging in place raised once.

HABITAT ATLAS

Stakeholder Priorities — the same building, weighed differently by each group.

RANK-WEIGHTED
PRIORITY ANALYSIS

Builder / Installer / Manufacturer

n = 7 - 37 stickers



TOP SUBCATEGORIES



Durability and craft lead; values close behind.

Practitioner / Consultant

n = 6 - 25 stickers



TOP SUBCATEGORIES



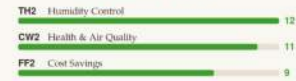
The flattest lens — thermal edges a wide field.

Educator / Researcher

n = 5 - 24 stickers



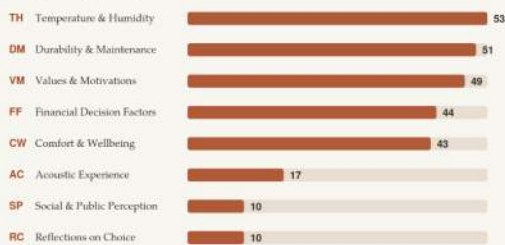
TOP SUBCATEGORIES



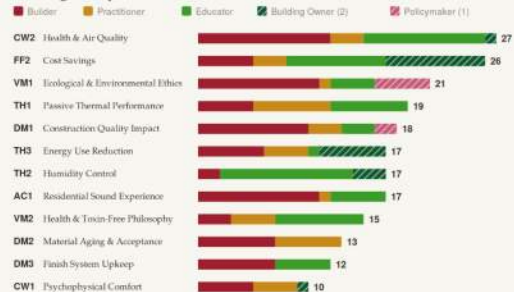
Health and humidity rise to the top.

OVERALL — 101 stickers : 5 stakeholder types - 25 subcategories

Categories by priority



Subcategories by stakeholder



Chosen by no one: AC2 Venue Acoustics · SP3 Public Attention · RC2 Hindsight & Lessons Learned

Method: priority score = sum of ranks (1 low — 5 top) each group placed on a subcategory. Ranks extracted from the wheel photograph; treat scores as x1-2. Small samples (n=5-7) — read as trends, not exact order. Hatched segments = a 1-2 person role (individual ballots, not a bloc).

Second Activity - results and findings

Two patterns are worth carrying forward. The comments kept returning to people rather than the material: the worry was rarely whether hempcrete performs, but whether the installer, tradesperson, architect, or inspector knows how to work with it, which echoes the occupant interviews, where finish and installation quality, not the substrate, shaped the lived experience. Several participants, the policymaker among them, asked outright for a benchmark they could cite, which is what the Atlas is designed to be. And the seats that never filled are a result in themselves: with no developer or financier in either activity, the money side of the decision, the part most central to de-risking, went unrepresented.

WHY IT MATTERS FOR THE FIELD

The field has defaulted to cost and energy proxies because occupant evidence in a usable form did not exist. This session produced a first read on what each stakeholder type actually weights, which is the input the next version of the Habitat Atlas needs in order to show each role the evidence that matters most to it first.



BBMC

Authored by

MASS.

2026 Summit Proceedings

Several results translate directly into the build. The cost finding argues for weighting priorities by intensity rather than counting them, so a minority-but-decisive concern is not lost in the average. The written gaps give a concrete shortlist of subcategories to test in the next round of interviews: lifetime cost to occupy, the disruption of building and moving in, end-of-life, and accessibility. The three dead spokes mark where the framework currently asks about things this audience does not weigh, and where the next interview round can ease off.

Beyond the tool, the session reframes the adoption barrier itself. The recurring worry about whether the trades can execute, set against occupant evidence that the material performs reliably, points the field toward workforce knowledge and citable benchmarks rather than further material testing. The Atlas is built to be the benchmark that participants kept asking for.

The absent seats tell organizers and the industry who needs to be in the room next. Bringing developers and financiers into a future round would close the one gap that most limits these findings. As pre-validation of the Atlas decision layer, the session also strengthens the case for the federal and state funding that would scale this work nationally.

WHAT THIS CAN AND CANNOT TELL US

This was a small, self-selected, single-event sample, and it should be read as direction rather than representation. Group sizes of five to seven people are too small to support a significance test, so the sheets are best read as tiers, with a clear top, a softer middle, and a tail of one-off picks. The wheel filled over the course of the day, so later participants placed their stickers in view of earlier ones, and the picture accumulated as a group conversation rather than a set of independent ballots. Holding everyone to five selections shows what people value without fully showing how much, which is part of why the wheel's intensity reading complements the count. I treat these results as pre-validation for the Atlas decision layer and as a way to sharpen the next round of occupant interviews, not as findings that stand on their own.

Collective Liberation: Relationship to Each Other

Led by

Ace McArleton, New Frameworks & Seed Collaborative
Haley Hardwick-Witman, Co-everything

Session Description

BBMC Principle 3 says:

Relationship to Each Other - Bio-based construction is a tool for collective liberation by transforming the social structures that govern our lives.

- Undoing Supremacy: Centering the active dismantling of supremacy and extractive power dynamics between people in every stage of our work.

We'd like to focus on the Undoing Supremacy aspect of this: dismantling colonialism, racism, and patriarchy and the integration of that work with the work of the BBMC and working with bio-based materials in general. How are we already embedding this principle within our biobased materials work and how can the BBMC more effectively enable the principle of right relationships as we build an alternative climate positive built environment industry/community of practice?

Report Back

This session provided a space for people to engage in dialogue on recognizing systems of oppression in the bio-based building field and brainstorm ways to connect and support each other in this work. We focused on the fact that this principle (Relationship to Each Other) is critical to the progress and success of the movement.

We began with a breathing exercise that focused on embodiment- to reset and ground ourselves, to pause, and to do it in a connected way. We called this whale breathing, where we all took a huge gulp of air and held it for 10 seconds to mimic a pod of whales swimming and breaching together.

We then provided framework to guide the breakout 1 on 1 discussions:

- What is the human-to-human analogy to respiration? With respiration, we can so clearly see the symbiosis and interconnection between plants and us. What distillations can we notice that reveal that for human & human? What is a symbiotic pattern you can name in your human to human relationships? (The things we give one another & receive - mutual aid, exchange, gifts, skill share)
- How do supremacy systems show up in the bio based movement? What can we notice?
- Regenerative design mentor talks about "tracks" - seeing a track of a process. What tracks do we see of supremacy systems in our movement? What can we do when we notice them? What can they tell us?
- What tracks of collective liberation can we see in our movement? What practices, what relationships, what wisdoms? How can we connect to and augment them?

After 15 minutes of the breakout 1 on 1 discussions based on the framing questions, we had a collective share back for anything that resonated or surprised people in their conversations, and discussion on those points.



BBMC

Authored by

MASS.

2026 Summit Proceedings

Who Attended

We held 2 sessions of roughly 10 people per session with the second session running into a longer discussion. Attendees ranged in experience level from recent college graduates to seasoned business owners. There were builders, architects, designers, building science consultants, product manufacturers, and researchers.

Outcomes From the Session

Themes arose that emphasized the importance of building empathetic, inclusive, and connected communities through intentional communication and shared understanding. There was also a focus on slowing down, engaging with curiosity, and recognizing that people are experts in their own lived experiences. Rather than disengaging, canceling, or “othering” one another, focus on creating spaces for dialogue, vulnerability, trust-building, and storytelling that allow diverse perspectives to be heard and valued.

The reflections also highlighted the need to recognize and navigate power dynamics, privilege, and decision-making structures with greater awareness and equity in our workplaces and bio-based materials movement. Sharing power, using inclusive language, and seeking common ground through tools like value mapping can help reduce unhelpful conflict and strengthen collaboration. In our culture shaped by isolation, productivity, and the pressures of capitalism, the findings encouraged people to reconnect intentionally, develop skills for difficult conversations, and approach each other with grace, patience, acceptance, and empathy.

The importance of daily practices that foreground our shared humanity and build positive culture arose as powerful intervention points to practice the world we want to make:

- daily check ins on build sites
- making sure to have not-working lunches and share and enjoy food
- naming power dynamics and supremacy systems clearly in the spaces we are in
- building solidarity amongst groups that share common experiences
- building solidarity across groups with different experiences

How This Session Will Benefit the Wider Bio-Based Building Materials Industry

We will go father together! So, how do we get and stay together? What blocks togetherness, and what builds it? These questions and how we work with them will determine how well we meet our aims.

Supremacy systems:

- Train us on how to be **separate** from each other, not be aware of ourselves, our emotions, experiences, and sensations.
- Teach us that there is only **one right way** and masquerades as “normal” and “natural”
- Assert that **command and control** and **punishment** are the only way.
- **Reduce** us to means to an end mentality and **extracts** value

Human-centered systems:



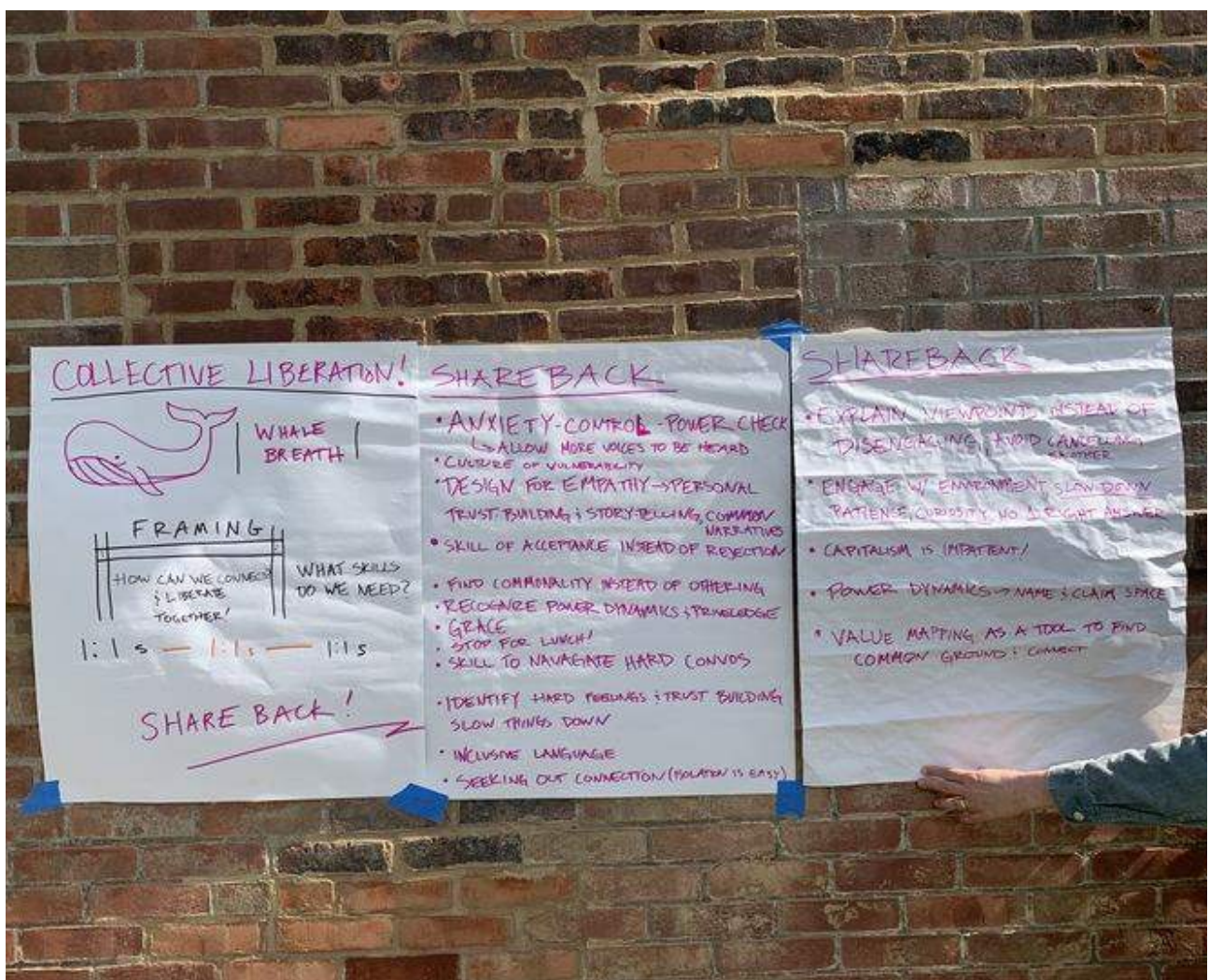
BBMC

Authored by

MASS.

2026 Summit Proceedings

- Take time to slow down to **connect, feel, notice**, and **attend** to what is present in the interaction with another person. **Embodiment** practices help to counter separation and build the potential for **stronger bonds**.
- Show us that while **patterns** of supremacy systems are critical to notice and understand **accountability** within, when we trust that every person has a **unique** experience and **shared humanity** within these patterns, we can endeavor to tune into and build on that.
- Center **curiosity, discovery**, and non-judgment to help us to **see what is** and **understand** each other.
- Promote **restorative** and **reparative justice** practices to move us towards the world we are building by practicing it now; by **restoring our full humanity** as we **heal** the real damage that supremacy systems and individuals' participation in them cause.



Program Co-Design: Investing in Scaling Bio-Based Solutions in NYS

Led by

Nyla Mabro, The Clean Fight
Thatcher Bell, The Clean Fight
Lovinia Reynolds, The Clean Fight

Session Description

Join The Clean Fight to help design a new program to invest \$750k into accelerating high-impact, market-ready bio-based solutions in New York. This interactive workshop will ask you to lend your unique perspective and expertise to help identify market opportunities, barriers, and the necessary support to deliver demonstration projects, and enable scalable, statewide adoption of bio-based technologies.

Our goal is to leverage the expertise of BBMC participants to design a program responsive to the needs of innovative materials companies, architects, and developers in the bio-based solutions industry

Report Back

What We Did

The Clean Fight facilitated conversations focused on understanding opportunities for scaling bio-based materials in New York. We asked participants to chart solution adoptability based on ease vs. impact to understand which solutions were ready to scale (see Image 1). Participants identified barriers to bio-based materials solution adoption and success factors for projects with bio-based materials. Finally, we asked participants how best to leverage a \$150k per project investment to accelerate both solution deployment and grow the broader industry.

Who Attended

Attendees included architects, bio-based materials solution providers, designers, building sustainability experts, and developers.

Organization	First Name	Last Name
Aecom	Nadine	Berger
Arbor Architecture	Chris	Fagan
Bo Lee Architects	Bo	Lee
Cast Carbon	Emily	Majewski
CB Design / Build	Andrew	Personette
CDR Studio Architects	Lea	Cloud
Circularly	Casey	Plasker
Columbia University / The Living	David	Benjamin
Full Circle Design Consulting	Z	Grabowski
Grubb Properties	Andy	Zou

InfraRE	Michael	Salvato
MBA student	Rainger	Pinney
North Woods Mass Timber	Emory	Baldwin
Parsons Healthy Materials Lab	Catherine	Murphy
Roundout Natural Builders	Jeff	Gagnon
Settlement Housing Fund	Eliot	Hetterly
Structure Design and Build	Peter	Hussey
Sustainable Comfort	James	Moriarty
Sweet Natural Plasters	Casandra	Sweet
Unknown	Emily	Peyton
Wythe Studios Architects	Jeni	Erbes-Chan
You Are The City / Columbia University	Kaja	Kuehl

Outcomes from the Session

Barriers to Solution Adoption and Scaling

Participants identified several barriers to the broader adoption of bio-based materials:

- Builder learning curve: Contractors and carpenters often resist unfamiliar materials and construction methods, even when they closely resemble conventional solutions
- Liability concerns: Builders are hesitant to use products without established track records due to fears of failures, callbacks, and unclear responsibility when problems occur
- Lack of manufacturer support: Concerns were raised about relying on overseas manufacturers that may not provide long-term support. Participants emphasized the need for companies that provide installation guidance and stand behind product performance
- Labor intensity and cost: Specialized installation requirements can increase labor costs and limit scalability
- Testing and code approval gaps: Certifications and code approvals are critical for market adoption. Materials lacking recognized certifications face significant barriers to inclusion in projects

Strategies for Scaling Bio-Based Materials

Participants recommended several strategies for scaling bio-based materials in New York.

- Focus on mastering a single, repeatable application before expanding into additional uses. One participant cited Portland cement, which was initially used only as mortar for 20 years before finding broader applications.
- Identify and support project champions who can advocate for novel materials within project teams
- Target clients motivated by health, sustainability, and ethical considerations, as they are often more receptive to bio-based materials e.g. early childhood centers, hospitals etc



- Focus on multifamily and owner-operated buildings, where long-term operational and health benefits may be more highly valued
- Invest in ecosystem-wide education to increase awareness and confidence among builders, developers, and communities
- Engage trade schools and workforce development programs to train the next generation of construction professionals
- Position bio-based materials as emissions-reduction solutions that can help building owners comply with New York City's Local Law 97 (LL97)
- Quantify and communicate resident health benefits, particularly for affordable housing developers, who may find these arguments compelling
- Leverage building standards and certifications such as Passive House. Incorporating bio-based materials into points-based systems could create stronger market incentives for adoption

Opportunities for Supporting the Bio-based Ecosystem

The Clean Fight asked participants how best a startup accelerator program could support the New York bio-based materials ecosystem. The Clean Fight can invest up to \$750k or \$150k per project to unlock bio-based solution deployments. Participants noted that while \$150,000 may not fully fund a project, it can help unlock additional sources of capital. Participants made the following recommendations for the use of funding and program foci:

- Support market development activities that build demand and confidence among developers, builders, and building owners
- Pay for high impact elements that can have scalable impacts vs impact a single project e.g. product certification, fire safety certification, certifications for aspects people already value e.g. soundproofing
- Support 'blueprint' projects that could be replicated e.g. modular farm worker housing using locally sourced building materials, standard ADU footprints etc
- Develop infrastructure to process regional feedstocks into finished bio-based products, which participants identified as a major ecosystem gap
- Invest in education and workforce development, particularly through trade schools and training programs
- Prioritize support for solutions that incorporate New York-based or regional feedstocks
- Increase public awareness of the performance, health, and sustainability benefits of bio-based materials through targeted marketing and outreach

How This Session Will Benefit The Wider Bio-Based Building Materials Industry

The feedback and unique perspectives provided by session participants will inform The Clean Fight's program design for a high-impact, accelerator tailored specifically to the needs of the bio-based materials industry. Insights from these sessions will inform program themes and structure, product focus. The Clean Fight intends to follow up with willing participants to gain deeper insight into the bio-based materials landscape and identify potential program participants. This session was the catalyst for a 12-month effort that aims to bring attention, resources, and investment to New York's bio-based materials industry.



BBMC

Authored by

MASS.

2026 Summit Proceedings

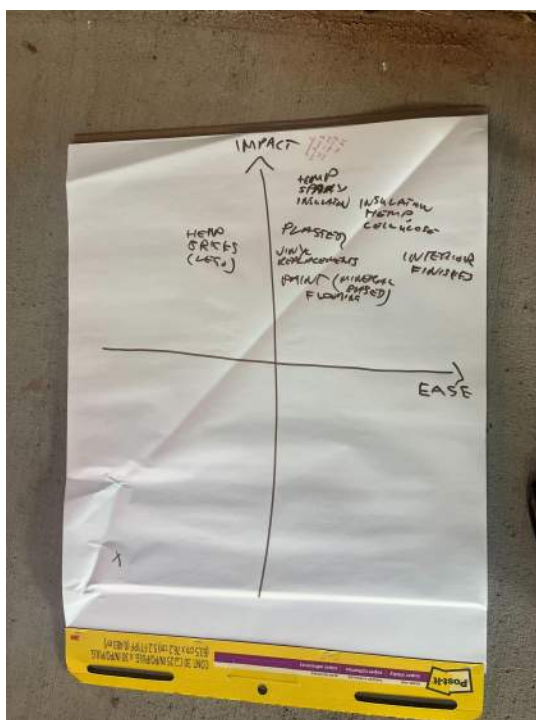


Image 1: Ease vs. Impact for Scaling Bio-Based Materials



Image 2: Program Session 1



Image 3: Program Session 3

What a Campus Could Hold - Rooting BBMC's Work in Place and Bioregion

Led by

Nicholas Salmons, Regenerative Pathways
David Fulton, Wild.Build and Treehouse.Coach

Session Description

BBMC has practitioners, manufacturers, and momentum - but no bioregional shared place. This table proposed both: a campus connecting farmers, foresters, manufacturers, builders, and policy in one hub. We explored what that could hold for the Hudson Valley bioregion - grounded in rehabilitating a mill campus in Chatham, NY.

We aimed to introduce a bioregional framework to BBMC's work and surface what a shared physical campus could anchor for the collective in the Hudson Valley BioRegion.

Report Back

What We Did

During the formal World Café sessions on Day 2 of the BBMC Summit, Nicholas Salmons and David Fulton facilitated two back-to-back roundtable discussions framed intentionally as an invitation to inquiry rather than a finished proposal.

SolAqua was introduced as a place in process: a 214-acre former mill campus with over 100,000 square feet of industrial space, existing solar infrastructure, an active tenant community, and a long-term stewardship vision. Situated within the Hudson Valley's history of agriculture, manufacturing, and place-based making traditions, the site served as a real-world grounding point for discussion.

The conversations evolved quickly between sessions. The first focused on surfacing broader needs, opportunities, and missing pieces across the ecosystem. The second moved further into site realities and design constraints, allowing participants to think against more concrete conditions. That shift immediately unlocked a deeper level of ideation.

A particularly meaningful contribution came from Kaja Kühl, who shared IBA Thüringen's Eiermannbau / Open Factory project in Germany, where an industrial site was intentionally opened to experimentation and pioneer users long before a final outcome had been determined.

The question emerging from that project, *"How little is enough?"*, became an important anchor.

More significantly, it reinforced a larger realization emerging across both discussions: the process itself may be part of the product.

Rather than participation serving only as a means toward a completed campus, the conversations suggested that relationship building, inquiry, experimentation, and allowing a place to reveal itself over time may themselves be among the most valuable outcomes.



BBMC

Authored by

MASS.

2026 Summit Proceedings

Together with references such as Fly Ranch and the Land Art Generator Initiative, a common posture emerged:

Place itself becomes the container for emergence, rather than the deliverable of a fixed plan.

Who Attended

Both sessions were fully attended, with roughly twenty participants joining across the two sessions.

Participants included architects, PhD students, builders, mass timber and hemp manufacturers, developers, urban planners, nonprofit leaders, regenerative finance practitioners, and people exploring cooperative ownership models.

Notably, many participants already had an existing relationship with the site and surrounding region. More than half of the first session consisted of people living in Chatham, Hudson, or nearby communities.

Sarah from architecture-towards-neutral reflected an important observation:

BBMC itself already functions as a cross-disciplinary ecosystem, bringing together academia, practice, construction, and emerging technologies. Any future campus would need to reflect that same diversity rather than narrowing toward any single constituency.

Key Themes That Emerged

Bioregion as shared language

Many participants were already practicing aspects of bioregional thinking through local sourcing, regional workforce development, and place-based material systems, even if they had not necessarily described it that way.

Framing the conversation around the Hudson Valley bioregion created a useful shared lens, allowing participants to see how forestry, manufacturing, construction, education, and policy become interconnected rather than isolated efforts.

Stewardship over master planning

One of the most important questions raised came from participants closely connected to the site's current artist and maker community:

Should the site become a polished "crown jewel" at all?

The question surfaced a productive tension around stewardship, authenticity, and participation. Existing tenants, artists, and makers cannot be treated as an audience for future change. They must be co-authors of it.

Questions around public versus private space, openness versus protection, and who gets access became important design considerations.

Program ideas emerged rapidly

As the discussions moved into more concrete conditions, ideas surfaced quickly, including:

- Regional bio-based material distribution and demonstration spaces
- Full-scale academic prototyping and build programs
- Visitor experiences connecting agriculture through construction
- Agroforestry trails and community gardens
- Sensor-instrumented buildings producing real-world performance data
- Hospitality programs that create long-term ambassadors
- Design-for-deconstruction approaches integrated from the beginning

Governance matters as much as buildings

Ownership structures, governance models, and stewardship repeatedly surfaced as foundational considerations rather than future details.

Worker-owned manufacturing, cooperative real estate structures, and shared stewardship frameworks pointed toward a broader understanding that regenerative outcomes require regenerative systems beneath them.

Reflections for the Wider Bio-Based Materials Movement

One of the clearest takeaways from these discussions was that the conversation quickly stopped being about materials alone.

Across BBMC there are already extraordinary projects underway: new materials, manufacturing approaches, research initiatives, educational efforts, policy work, and community-based experimentation. Many members are carrying important pieces of the larger transition.

The opportunity may not be inventing entirely new pieces, but weaving those existing efforts into stronger systems of relationship and mutual reinforcement.

This points toward a broader role for regenerative campuses.

Not simply as physical places or innovation hubs, but as connective infrastructure capable of linking otherwise disparate efforts into something larger than any individual project could achieve on its own.

If the future of bio-based materials is ultimately bioregional, then the places that support them may need to function in the same way: as living ecosystems where manufacturing, education, governance, research, stewardship, and community become part of a shared whole.





From Field to Building: Envisioning a Regional Bio-Based Demonstration Campus

Led by

Julie Stinar, ENaBL- Evensong Natural Building Lab

Session Description

ENaBL is developing a campus of demonstration structures and teaching buildings on a Maryland farm to highlight regionally grown bio-based materials. This session will gather stakeholder brainstorming on compelling materials, processes, collaborations, and funding strategies that could bring an inspiring, impactful demonstration campus to life.

This session will highlight the materials, partnerships, and funding approaches that could make a bio-based demonstration campus both inspiring and feasible.

Report Back

At the BBMC conference, ENaBL hosted two small group sessions titled *"From Field to Building: Envisioning a Regional Bio-Based Demonstration Campus."* About fifteen people joined across both sessions, including educators, builders, architects, and students.

We gathered around a laptop presentation (attached) since there wasn't a screen available, which made the conversation more personal and interactive. Pictures and video of the campus site were shown and our concept for the campus discussed and participants quickly engaged in discussion. A QR code for digital feedback remains available for anyone to use. We wrote directly on flip-chart pages, which captured the most valuable ideas. Those pages, along with the presentation slides, are included with this summary.

What We Did

The session introduced ENaBL's concept: a campus that promotes agriculture for the built environment by connecting the dots of agriculture, manufacturing, and building design through demonstration structures and hands-on learning. We shared early campus ideas and invited participants to imagine what success could look like for both ENaBL and the wider regional network of bio-based materials.

Who Attended

About fifteen participants attended across two sessions. The group included educators, builders, architects, and students. Several were based in Maryland, and we made new connections with local professionals interested in continuing the conversation.

Outcomes from the Session

The flip-chart notes revealed three main themes.

Partnerships and Funding

Participants suggested collaborations with agencies such as USDA, HUD, EPA, and HHS, along with local organizations like Station North Tool Library and Sandtown Furniture. The focus was on connecting ENaBL with partners who could help bridge education, manufacturing, and public engagement.



BBMC

Authored by

MASS.

2026 Summit Proceedings

Materials

The materials discussion was rich and regionally focused. Attendees listed straw, hemp, wood, earth, stone, wool, phragmites, seaweed, and biochar as promising resources, along with composites using mycelium. The group emphasized the diversity of materials available in the Mid-Atlantic and the potential for ENaBL to serve as a testing and teaching ground for locally sourced systems.

Structures and Processes to Demonstrate

Participants proposed demonstration ideas such as identical buildings for comparison, rubble trench and pier foundations to reduce use of concrete, biomass heating, compressed-air battery systems, and pumped-hydro storage. These ideas showed interest in ENaBL as a living laboratory where materials and performance can be studied side by side.

Overall, the tone was optimistic. People were excited about the campus concept, even though ENaBL's Maryland location sits slightly outside the predominant BBMC area. That distance was seen as an opportunity to expand the network's reach.

How This Session Benefits the Industry

The session helped clarify what the bio-based building community desires from a regional demonstration campus: connection, visibility, and proof of concept. By bringing together voices from education, design, and construction, ENaBL began mapping how one site could serve as a hub for collaboration. The feedback gathered will guide the next planning phase and help refine which materials and systems to prioritize. The conversations built momentum and confirmed that there is shared interest in creating a place where innovation and regional identity meet.

From Field to Foundation:
Envisioning a Regional Bio-Based Campus at ENaBL
Envisioning Natural Building Lab in Sharpsburg, Maryland
ENaBL
Julie Gray Stinar • Founder ENaBL
www.enablnonprofit.org • givebutter.com/enabl
© 2020, Envisioning Natural Building Lab Inc. PROPRIETARY

Why We're Here
We're building something new, and your expertise matters.
We want this campus to be shaped by the people who are already advancing bio-based materials and are dedicated to growing the movement.
© 2020, Envisioning Natural Building Lab Inc. PROPRIETARY **ENaBL**

What is ENaBL?
A new Maryland 501(c)(3) nonprofit rooted in:
Promotion, Education, and Research of regionally grown, agriculturally sourced building materials
Hands-on learning and shared discovery
Building a community around better ways to build
Supporting a regional supply chain from farmers → processors → manufacturers → builders
© 2020, Envisioning Natural Building Lab Inc. PROPRIETARY **ENaBL**

Why ENaBL Matters
A publicly accessible campus showcasing diverse natural materials and techniques
A hands-on learning environment beyond single-material workshops
Programs tailored to different audiences — from professionals to newcomers
A regional hub that strengthens the entire bio-based ecosystem
© 2020, Envisioning Natural Building Lab Inc. PROPRIETARY **ENaBL**



BBMC

Authored by

MASS.

2026 Summit Proceedings

The Site: Evensong Farm

Our home base: a historic Maryland farm

- 130-acre farm adjacent to a Civil War battlefield
- Two acres dedicated to the demonstration campus
- Surrounding fields for growing hemp, flax, and other crops
- Woods available for selective, sustainable harvesting
- Easement ensures focus on regionally available East Coast materials



© 2024, Evensong Natural Building Lab Inc. PROPRIETARY ENaBL

The Campus Vision

Emerging concepts for campus layout:

Pavilion

For classes, workshops, and gatherings — a place for active learning

Showcase Buildings

To demonstrate diverse materials and methods — a place for immersive learning

Gardens & Pathways

Weave the campus together — a place for exploration and connection

Amphitheater

A peaceful spot to look back upon the campus — a place for reflection



© 2024, Evensong Natural Building Lab Inc. PROPRIETARY ENaBL

What Success Looks Like

A welcoming destination where:

- People of all backgrounds can explore bio-based materials firsthand
- Agriculture, forestry, construction, and design communities connect
- Visitors leave inspired and informed
- Innovation and regional economic opportunity thrive



© 2024, Evensong Natural Building Lab Inc. PROPRIETARY ENaBL

What We Want to Learn From You

What would make this campus:

- Inspiring and useful?
- A powerful tool for public education?
- A catalyst for industry growth?
- A place that supports your work?
- A destination that brings new people into the movement?
- A strong partner for collaboration?
- A compelling opportunity for investment or funding?



© 2024, Evensong Natural Building Lab Inc. PROPRIETARY ENaBL

Share Your Input

Your expertise is essential to shaping this campus



Link: <https://forms.office.com/r/cMh2VWg0P7>
Feel free to share the Form with colleagues

© 2024, Evensong Natural Building Lab Inc. PROPRIETARY ENaBL

From the Ground Up





What materials or systems feel important to showcase?



What processes or methods should be demonstrated?



What workshops, classes, or hands-on experiences would excite newcomers?



What partnerships or collaborations feel essential?



What funding or impact strategies feel promising?



What would make this place feel alive, useful, and worth returning to?

© 2024, Evensong Natural Building Lab Inc. PROPRIETARY ENaBL

What Happens Next



- Synthesize**
We'll synthesize your input
- Integrate**
Integrate it into campus design and strategic plan
- Partner**
Identify partnerships, funding, and collaborators
- Grow**
Keep this community involved as ENaBL grows

© 2024, Evensong Natural Building Lab Inc. PROPRIETARY ENaBL

Thank You.

Thank you for helping shape ENaBL's future.
Let's build this movement together.



www.enablnonprofit.org • givebutter.com/enabl
Julie Gray Stinar • 301-491-2224 • julie@enablnonprofit.org

© 2024, Evensong Natural Building Lab Inc. PROPRIETARY ENaBL

MATERIALS

STRAW - SIPS, BALE, LIGHT STRAW CLAY, PRESSED PANEL

HEMP - BLOCK, CAST, ~~SPRAY~~, PANEL
"HEMP WOOD" "HEMP TEXTURE"

WOOD - MASS TIMBER, ~~WRE~~ "INVENT WOOD", "TIMBER HP"
CORD WOOD

EARTH - COB/ADobe, FLOCKS, RAMMED EARTH,
STONE -

MYCELIUM - BRICKS, COMPOSITE W/ WOOD CORE + FRP SHELL
WASTE MATERIALS FROM MULL CRIPAL GOVT

Wool - Oregon Shepherd, Black Mountain

PHRAGMITES

SEAWEED

SHELLS FOR STRUCTURAL AGGREGATE

BIO CHAR ⇒ BIO GENIC CARBON

STRUCTURES / PROCESS

- IDENTICAL BUILDING FOR COMPARISON + STUDY
- FOUNDATION - RUBBLE TRENCH, PIER, STONE
- BIO MASS HEATING
- COMPRESSED AIR BATTERY
- PUMPED HYDRO

PARTNERSHIPS / FINANCE

USDA, HUD, EPA, HHS

INTERIORS - FURNITURE / TEXTILES / NATURAL DYES
FIBERSHED

STATION NORTH TOOL LIBRARY, BALTIMORE

SANDTOWN FURNITURE, BALTIMORE



BBMC

Authorized by

MASS.

Standardizing Carbon and PCR Frameworks for Hemp-Based Materials

Led by

Caroline Dunn, BIOBUILD

Session Description

Join a focused discussion on developing Product Category Rules (PCRs) and carbon accounting frameworks for industrial hemp within ASTM D37. This session will share progress, identify key challenges, and invite experienced stakeholders to contribute to shaping credible, standardized pathways for biobased materials in construction and agriculture.

Report Back

What You Did

This session focused on the current challenges of applying Environmental Product Declarations (EPDs) and Life Cycle Assessment (LCA) methodologies to bio-based building materials currently on the market, specifically HempWood products and New Frameworks straw panels. The discussion centered on where existing standards do not accurately reflect the realities of natural materials and agricultural products.

Key discussion points included the mismatch between 70-year reference service lives used in EPDs and the much shorter warranty periods recognized in U.S. construction law, which can distort maintenance and lifecycle calculations. Participants also discussed how cradle-to-gate analysis is often more useful for manufacturers than cradle-to-grave analysis.

The group identified several areas where ASTM work could improve consistency across the biofiber industry, including alignment between Product Category Rules (PCRs) for agricultural and short-cycle plant fibers, coordination with ASTM C16 biobased insulation efforts, and protection of multi-product industry-wide EPDs. Additional topics included measuring fiber characteristics across species, accounting for natural variability in plant materials, adapting standards to rapidly changing cultivars, improving end-of-life accounting methods, and reducing opportunities for greenwashing in carbon markets.

Who Attended

Approximately seven people attended both sessions cumulatively. On the notepad, participants were asked to put a dot next to their role(s) within the industry. Photo pasted at the bottom of this write-up. Results:

- 3 builders
- 6 educators
- 2 designers
- 1 agricultural representative
- 5 inventors/entrepreneurs
- 4 policy professionals
- 5 researchers



BBMC

Authored by

MASS.

2026 Summit Proceedings

- 2 manufacturers

Outcomes From the Session

The session produced direct technical feedback related to carbon accounting, EPD development, and standardization methods for bio-based building materials. A major outcome was identifying where current LCA and EPD frameworks are poorly suited to natural materials because they are based on industrial product assumptions.

Participants emphasized the need for better alignment between PCRs across the biofiber sector and identified coordination with ASTM C16 as a useful next step. The group also discussed the importance of creating standards that account for the variability of natural materials instead of treating variability as a problem to eliminate.

Other key outcomes included:

- Recognition that cradle-to-gate analysis may be more useful for many manufacturers (Hempwood had to include 70 years of vacuuming in their EPD for a product with a standard US manufacturer 25-year warranty.)
- Need for better end-of-life accounting methods within ISO 21930 frameworks (No more 1 in 1 out)
- Interest in consistent methodologies for soil carbon accounting across crops
- Discussion about preventing greenwashing in carbon credit systems
- Interest in creating future pathways for homeowners to participate in carbon markets connected to bio-based materials

The feedback from this session will be carried into ongoing ASTM work and future conference and networking discussions. The session was useful in connecting policy and standards work directly to the experiences of people actively working within the industry.

How This Session Will Benefit the Wider Bio-Based Building Materials Industry

This session will help support the development of standards and carbon accounting methods that better reflect the realities of natural materials and agricultural systems. Current frameworks are largely based on industrialized and chemically standardized products, which often creates inaccurate or incomplete assessments when applied to plant-based materials.

Developing methodologies that account for temporal carbon accounting, biological growth cycles, and agricultural systems can improve the accuracy and usefulness of standards across the industry. This approach can also support innovation by allowing bio-based materials to be evaluated on their own terms rather than forcing them into frameworks developed for conventional products.

The session reinforced the need for standards that recognize natural materials as inherently valuable materials with different performance characteristics, rather than treating them as direct substitutes for industrial products.

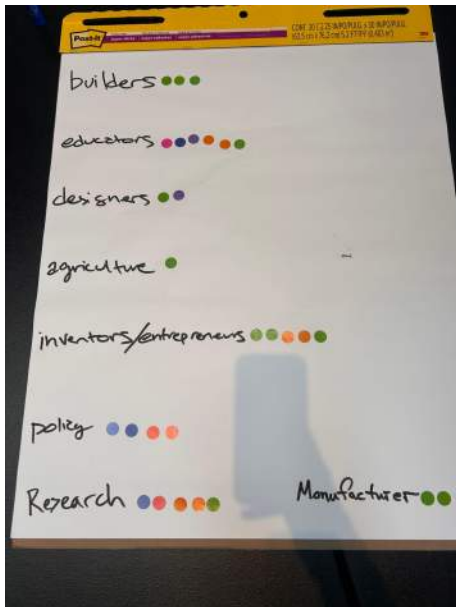


BBMC

Authored by

MASS.

2026 Summit Proceedings



BBMC

Authorized by

MASS.

Bio-Based Materials in Multifamily Housing Building Envelopes

Led by

Brian Sandford, Studio G

Session Description

This session will focus on generating ideas to include in an in-progress guide aiming to help design teams use bio-based materials within the exterior envelopes of mid-rise multifamily buildings. We will start with a brief summary of the survey work done so far, before jumping into an interactive design charette.

The session will generate ideas for a future publication to share with the broader design industry.

Report Back

Background

This working group was established in Fall 2025, with the goal of producing a guide for designers, contractors, and developers to maximize the use of bio-based materials in the envelopes of mid-rise, multifamily buildings. Much of the existing knowledge and resources in the field are aimed at single family homes, or on unique case study projects that aim to push boundaries. Our guide is trying to fill the gaps between the two ends of the spectrum. We are hoping to help teams build envelopes that are maximally bio-based while still being affordable, practical, and code-compliant.

Over the last 8 months, we have been engaged in a series of interviews and discussions with folks across North America to get a sense of status quo. We have been collecting data on a variety of projects, including specifics on the wall and roof assemblies that have been designed and built.

The workshop served as a sort of check-in for the group, giving us a chance to get feedback on the first phase of our efforts, and provide ideas and energy to push us into the second phase.

What We Did

We convened two sessions of informal discussions. We started with a very brief (less than 5 minute) presentation of the survey information collected so far, and then spun right into open discussion. Participants came from a wide variety of backgrounds, including architecture and design, consulting, contracting, ownership and development, and material manufacturing.



BBMC

Authored by

MASS.

2026 Summit Proceedings



Discussions in the first session.



Continued conversations during the second session.

Outcomes From the Session

One key outcome was affirming the survey data we had collected about the existing status quo. All the designers, contractors, and owners working at a similar mid-rise scale confirmed that the typical wall and roof assemblies we had aggregated matched their experience.

Another was confirming the focus of our work due to salient differences between the single-family and multi-family scale. Multiple attendees came from a single-family background, and while their insights and feedback was hugely helpful, many of the specific strategies that work at the scale of an individual home do not directly translate to larger projects.

Much of the discussion centered around overcoming barriers of cost and perceived risk, more than technical feasibility and code compliance. This is a recurring theme in BBMC discussions as a whole, and it certainly applies here.



BBMC

Authorized by **MASS.**

Bio-Resilience Hubs

Led by

Mary Lambert, Garrison Institute
Billy Craig, BC Productions

Session Description

Resilience hubs, such as libraries and community centers, are already in place and often anchor vibrant, thriving communities. This session invites participants to reimagine resilience hubs as new, dynamic, multi-functional foundations and pillars that foster connection, resource sharing, and local capacity—supporting communities in both everyday life and times of disruption. Together, we will define what an integrated, future-ready hub can be—one that weaves bio-based materials and sustainable processes into its design—while identifying opportunities to grow, make, and build with nature-based solutions in ways that ideally enhance both function and purpose. By harnessing collective insight and creativity, the session aims to move from vision to action, advancing climate-positive, life-enhancing and potentially lifesaving, community spaces.

Report Back

What We Did

The session focused on exploring the concept of Resilience Hubs—specifically how to evolve them from sterile emergency shelters into holistic, bio-based, and community-centered spaces that align with the Garrison Institute's mission of building a compassionate, resilient future.

Who Attended

The sessions engaged a dynamic group of Summit participants split into working groups. While not a rigid list, attendees consisted of forward-thinking professionals, advocates, and builders deeply invested in bioregional resilience, circular economies, and sustainable architecture. The group was highly collaborative, ultimately providing concrete frameworks and real-world examples to advance the project.

Outcomes from the Session

- **Rejection of the "Bunker" Model:** Participants broadly agreed that current resilience hubs in the Western US are deeply flawed. They were described as unattractive, government-funded "bunkers" that only function as temporary emergency shelters during disasters. They completely lack eco-friendly, bio-based, or regenerative design.
- **A Holistic Vision for Hubs:** The groups redefined ideal resilience hubs as welcoming, inclusive, and inter-generational spaces. Instead of sitting empty between crises, they should serve as vibrant community centers that host:
 - Educational programming and cultural events.
 - Resource-sharing initiatives (e.g., tool libraries, seed banks, equipment, and services).
 - Skill-building and emergency training tailored to the specific threats of that region.
- **The Funding & Trust Dilemma:** There was notable hesitation regarding relying solely on government funding, primarily due to issues of community trust.
- **Leveraging Existing Infrastructure:** To bypass trust issues, participants advocated for partnering with and adapting trusted, existing community spaces—specifically libraries and



BBMC

Authored by

MASS.

2026 Summit Proceedings

schools—which already informally act as resilience hubs and have established community buy-in.

- **Centering Vulnerable Communities:** Participants emphasized that these hubs must be intentionally designed from the ground up with vulnerable populations in mind, ensuring they are safe, accessible, and supportive.
- **A Launchpad for Design:** The sessions were highly actionable; participants left Mary with a robust collection of bio-based building examples, frameworks, and resources to directly inform the Garrison Institute's future architectural designs.

How This Session Will Benefit the Wider Bio-Based Building Materials Industry

- **Establishes a High-Profile "Living Laboratory":** By integrating bio-based materials into highly trusted, high-traffic public spaces like libraries and community hubs, the industry gains a powerful, visible showcase. This normalizes bio-based materials for the general public and local governments, driving mainstream demand.
- **Proves the Business Case for Climate Resilience:** The session directly linked bio-based building to life-saving climate adaptation. For example, discussing how the natural thermal qualities of bio-based structures keep spaces cool without air conditioning targets the deadliest weather-related hazard in the US (extreme heat). This provides the industry with a compelling, data-backed selling point.
- **Creates a Permanent Educational Pipeline:** Because these hubs are envisioned to feature circularity-themed resources and bio-based building information, they will act as permanent, regional education centers. This directly primes future consumers, builders, and policymakers to choose bio-based alternatives.

