DECARBONIZATION DIALOGUES:

STRATEGIES, INSIGHTS & ASPIRATIONS FOR RESEARCH EXCELLENCE

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Decarbonization Dialogues: Strategies, Insights & Aspirations for Research Excellence **was a special Fall 2024 symposium hosted by the Graham Sustainability Institute in collaboration with a diverse group of university co-sponsors. This event united the University of Michigan (U-M) research community to explore ways to enhance and advance collective decarbonization efforts.**

The symposium featured key university leaders and distinguished researchers engaging in lively discussions on opportunities to strengthen U-M's decarbonization research initiatives, drawing on experiences from both within and outside the university.

Participants provided direct input on key opportunities captured in visual murals, networked with colleagues and panelists, and explored tables showcasing the resources and support available to U-M's decarbonization researchers.

Research Community Insights Panel

The Research Community Insights Panel highlighted U-M's evolving approach to decarbonization research, emphasizing key traits such as intentionality, systems thinking, equity, and alignment with societal needs.

The panel underscored the opportunity to build on areas where U-M is already making strong progress but has the potential to elevate its efforts to a leadership level. These include fostering deeper community engagement, amplifying social impact, advancing justice in technology deployment, and clearly defining and leveraging Michigan's unique value proposition in decarbonization research. Common ideas emerged among panelists on key elements for advancing U-M's decarbonization research efforts, summarized below.

Align Research with Societal Needs

The University of Michigan has a unique opportunity to maintain its commitment to disciplinary research excellence while expanding collaborative efforts to address pressing societal challenges. This approach aligns with U-M's public service mission and has the potential to drive meaningful change on a large scale. Given the university's size and breadth, U-M is well-positioned to lead in this space and share insights with other institutions. Initiatives like Vision 2034 and the campus-as-a-living-laboratory (CLL) framework present pivotal opportunities to advance decarbonization research with greater clarity, purpose, and impact.

Maintain a Systems Approach

Decarbonization requires a systems approach that recognizes the interconnectedness of energy, food, water, justice, and other critical factors. Solutions must be context-sensitive and equitable, addressing challenges holistically while minimizing unintended consequences, such as those arising from global supply chains. Embracing systems thinking underscores the need to reconfigure existing structures and acknowledges that progress is not only a technical endeavor, but also a relational practice that evolves over time.

Drive Collaboration and Engagement

Effective collaboration is central to scaling impact. To fulfill the university's public service mission and enable transformative work with far-reaching effects, further support and emphasis on interdisciplinary and external partnerships are essential. This includes bridging disciplines from engineering to anthropology, social work, work, public health, and others, recognizing the interplay between people and technology, and ensuring that solutions are inclusive and socially relevant. Leveraging the arts and humanities—including the Arts Initiative and other campus efforts—will complement technology with imagination and cultural engagement, elevating storytellers, visionaries, and creatives in decarbonization efforts. Collaboration beyond campus and across sectors is vital, as it enables the university to co-produce knowledge and create lasting impact.

Ground Efforts in Place and Communities

Energy transitions happen in specific places and are fundamentally about power—both literally and societally. Therefore, community engagement is essential. Prioritizing early, transparent communication with communities and maintaining ongoing dialogue to build trust and address local concerns post-deployment are crucial to ensuring effective, durable, and equitable outcomes.

By leveraging its scholarly strengths through external partnerships, U-M can create real-world benefits that uphold academic rigor while amplifying societal impact. Efforts such as SEAS engagement initiatives and the College of Engineering's people-first framework exemplify the university's commitment to addressing the ethical implications of policy and practice, but more can be done. We must work to repair mistrust between academic institutions and local communities, transcending partisan divisions by fostering authentic, mutually beneficial collaborations with citizens, businesses, and organizations to drive collective progress.

Prioritize Justice and Equity

Justice and equity must underpin all efforts toward a more sustainable future. Deploying solutions that are adaptable to diverse contexts, particularly in underresourced communities, is essential to decarbonization. At U-M, there is a strong commitment to these principles, along with a growing appetite to integrate them more fully into research and practice, as reflected in the broader goals outlined in U-M's strategic plan, Vision 2034.

Transform U-M's Systems and Structures

For U-M to lead in decarbonization, it must also evolve internally. This includes rethinking incentive systems, which currently prioritize individual achievements and grant size over community impact and collaborative efforts. The university must also find ways to generate research agendas that are unconstrained by federal funding priorities, addressing emerging challenges with urgency and innovation. Better aligning university timelines with those of communities is another critical step, as is building infrastructure to support long-term, trust-based relationships. These structural changes will enable U-M to sustain impactful external partnerships and drive meaningful progress on global decarbonization.

Leverage Student Engagement

Engaged students can play a crucial role in advancing change by encouraging faculty and researchers to consider the social and ethical implications of their work in new ways. This student-driven perspective enhances the quality and broadens the scope of research and teaching, helping U-M pursue innovation while addressing broader societal needs. Additionally, the work students do—especially within a CLL

framework—can have lasting impact, as they carry their learnings and insights into new communities and careers after graduation, continuing to drive change and innovation.

U-M's "Secret Sauce"

U-M's interdisciplinary strengths, scale, and public mission distinguish it as a leader in decarbonization. Its "Midwestern" culture and diverse expertise further equip the university to tackle complex climate challenges.

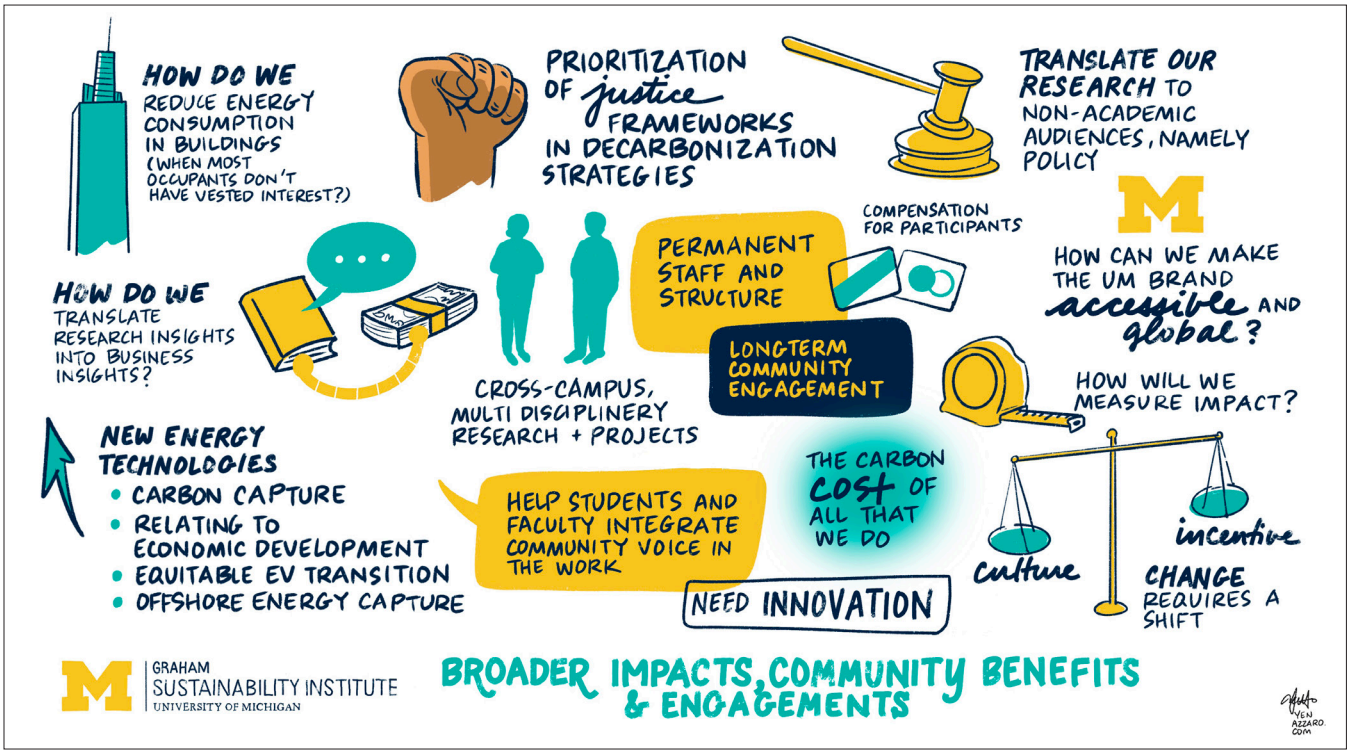
COMMUNITY RESPONSE CONVERSATIONS

Following the formal program, participants transitioned to an informal setting to explore discussion prompts centered on (i) broader impacts, community benefits & engagement and (ii) the campus-as-a-living-laboratory (CLL) concept.

Facilitated by campus leaders, these one-on-one and small group discussions fostered open idea-sharing, supplemented by sticky note contributions that were visually documented. The following summary captures the breadth of ideas shared during these sessions, reflecting diverse perspectives rather than a consensus among participants.

Broader Impacts, Community Benefits & Engagement

Participants approached the topic of broader impacts, community benefits & engagement with enthusiasm, emphasizing the importance of integrating community voices, fostering justice, and building meaningful relationships. The conversations revealed a shared desire to conduct impactful research in the decarbonization space, but the focus quickly shifted to the critical question of how to achieve this effectively. The prominent themes from these discussions are summarized below.



Key challenges in community engagement: While progress has been made, U-M continues to face significant hurdles in effectively engaging with communities. External partners often search in vain for a clear "front door" to connect with the university's decarbonization researchers. Academic timelines misaligned with real-world needs, as well as barriers to providing equitable compensation for community partners, further complicate collaboration.

Participants emphasized the importance of researchers listening deeply to communities to understand their needs and build trust. Sustained infrastructure is crucial to supporting long-term relationships that

extend beyond the lifespan of individual projects. Meeting communities where they are—both physically and contextually—was also highlighted as essential, ensuring U-M's efforts align with local priorities such as job creation, resilience, and faith-based values.

To address these challenges, U-M should leverage its existing strengths, such as the Ginsberg Center and community-based research programs and courses, to bridge gaps and foster meaningful, long-term partnerships.

Demonstrating and measuring impact: Evaluating engagement and research impact emerged as a key theme. U-M can leverage both external sector experience and internal strengths, such as the Institute for Social Research (ISR), to assess decarbonization initiatives. Participants suggested incentivizing long-term evaluation to measure outcomes. Additionally, large-scale demonstration projects in sectors critical to the region—such as agriculture, automotive, and manufacturing—could showcase the economic growth potential and social benefits of decarbonization.

Scalability and transferability: Localized solutions are essential, but they must also be scalable and transferable. Participants identified research opportunities to develop scalable, context-responsive decarbonization models, alongside higher-level strategies for regional and academic collaborations, collective impact approaches, and force-multiplying university-industry partnerships that can drive and accelerate wider impact. Concerning Michigan, participants highlighted specific opportunities to support the state in developing decarbonization roadmaps, advising the Michigan Public Service Commission on integrating equity considerations into rate-setting, and addressing other state-specific needs.

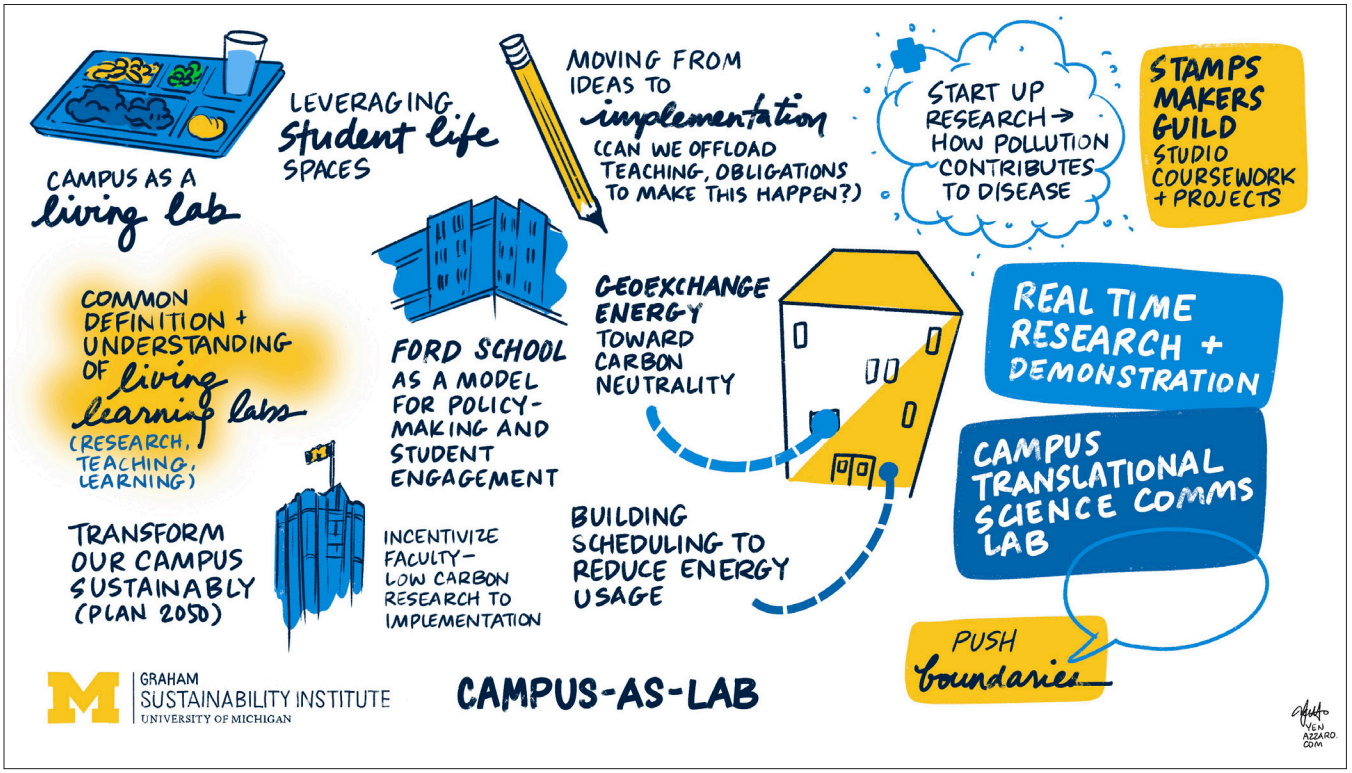
Equity, justice, and engagement: Equity and justice emerged as central themes, especially in reaching underserved and remote communities. Participants noted significant research potential in exploring the sociotechnical intersections of energy and justice, as well as procedural justice in the development of new energy systems. They also emphasized the critical importance of involving communities in designing decarbonization technologies.

Building cross-disciplinary bridges: Interdisciplinary collaboration was identified as crucial to success, with insights from the social sciences considered essential for informing effective community engagement. While these insights enhance community engagement, bridging the social sciences with technology, policy, and behavioral fields amplifies impact. Public art and the creative industries help embed sustainability into culture, and translational science communication makes research actionable for policymakers, businesses, and communities. Centers and institutes, cross-appointments, and other university channels provide vital cross-disciplinary connections.

Overall, the discussion highlighted both the challenges and opportunities in U-M's efforts to achieve broader impact and engage with communities. By addressing structural barriers, leveraging its strengths, and embracing equitable, interdisciplinary approaches, U-M can strengthen partnerships and amplify its role in regional and global decarbonization efforts.

Campus as a Living Laboratory (CLL)

These conversations echoed with calls for a clear U-M Campus as a Living Laboratory (CLL) vision to drive applied research, teaching, sustainability, and operational innovation. A formal program would foster collaboration among researchers, facilities management, students, and administrators, while enabling outreach activities and the translation of research into practical solutions. This initiative would transform campus infrastructure, advance research, and position U-M as a leader in sustainable innovation. With dedicated resources to complement a vision and formalized program, U-M has the opportunity to become the "state's largest sustainable developer," in alignment with Campus Plan 2050. More details are presented below.



Defining the CLL concept: Broadly, the CLL concept utilizes campus infrastructure and daily operations to test and implement sustainable solutions. Participants emphasized the need for a shared definition and a formalized CLL program to facilitate common understanding and foster collaboration across departments and, critically, with facilities management. There were calls to address all aspects of campus operations, from renewable energy and energy management to building construction, renovation and use, landscaping, and sustainable lifestyle changes, with ongoing monitoring and maintenance to ensure long-term sustainability.

Engaging faculty and incentivizing research: Early and meaningful faculty engagement is critical for CLL's success. Offering incentives such as research support and teaching relief would allow faculty to prioritize CLL projects and facilitate the translation of research into campus implementation. Early involvement ensures that campus demonstration projects align with faculty research agendas, fostering collaboration and innovation.

Leveraging student engagement: A robust CLL program can tap into student engagement through research and hands-on experiences. Utilizing Student Life spaces, such as residential and dining halls, will provide experiential learning environments, allowing students to explore real-world sustainability applications. Studio courses and organizations like the Stamps Makers Guild can further position the campus as a hub of innovation.

Activating the whole university, including all campuses: Participants called for CLL to encompass not only the Ann Arbor academic campus but also Flint and Dearborn, Michigan Medicine, Athletics, and off-campus units (such as field stations and medical clinics). Spaces like the Matthaei Botanical Gardens and Nichols Arboretum (MBGNA) offer unique opportunities for both built environment projects and social science research.

Testing new approaches: U-M can leverage its campus as a living laboratory to pilot innovative technologies, such as closed-loop advection geothermal heating and cooling systems, while learning from retrofitting existing infrastructure. Moreover, the university can extend its efforts beyond technology, exploring new avenues in science, social science methodologies, and other decarbonization interventions.

Addressing behavior change and communication: Participants emphasized the importance of both assessing behavior-related impacts on the campus footprint and fostering behavior change. Many in the campus community, regardless of whether decarbonization is central to their role, seek resources on sustainability and decarbonization. Creative engagement strategies and clear communication—bolstered by the longitudinal Sustainability Cultural Indicators Program survey analysis, along with support from research administrators and staff who can share resources and amplify efforts—will encourage broad participation.

By building a shared vision and investing in a formalized CLL program, U-M can transform campus infrastructure and lead the way in sustainability innovation, creating a model for universities and communities nationwide while extending its impact beyond campus. Achieving this will require deep collaboration among faculty, students, and staff, with a commitment to sustainability across every aspect of campus life.

CHALLENGES TO OVERCOME

- **Alignment of university and community timelines:** Community needs often extend beyond academic schedules, leading to gaps in support. Faculty struggle to address urgent community requests due to limited time and competing responsibilities. Better alignment of these timelines is essential for sustained engagement. Similarly, aligning the efforts of climate scientists and technologists would enable more timely and effective solutions.
- **Coordinating sustainability efforts:** U-M's decentralized structure hinders cross-department collaboration, leading to unshared insights and overlapping projects that dilute impact. This also complicates engagement with external partners, as the appropriate channels and points of contact are unclear.
- **Incentive misalignment and cultural barriers:** The tenure system prioritizes individual publications and grant size over community impact, deterring faculty from engaging in interdisciplinary, community-driven sustainability work. Although leadership discussions are underway, current incentives remain limited and uneven across career stages. Additionally, limited resources for project reevaluation hinder continuous improvement and cultural change.
- **Resource and funding constraints:** Energy efficiency projects require dedicated funding beyond sources like the IRA, and CLL initiatives need additional resources to support meaningful faculty and student participation.

CROSS-CUTTING IDEAS

- **Provide resources:** Offer physical space and financial resources beyond individual projects to support innovation. Allocate resources for research support staff to connect, collaborate, and share ideas. Provide funding to empower faculty, postdocs, and students to drive CLL transformation and foster long-term engagement with local communities.
- **Equip students to be change-makers:** Cultivate student leadership through engagement in spaces like CLL and Student Life. Leverage makerspaces and studios to provide students with the expertise and opportunities to bring ideas to life and develop actionable solutions. Actively recruit students from communities where decarbonization is critical to create meaningful, lasting impact. Regarding curriculum, which participants acknowledged was not the primary focus of this event, expand upon the community-engaged design courses currently offered through the College of Engineering.
- **Lean into our capacity for leadership:** U-M can drive the deployment of innovative technologies through demonstration and collaboration. By embracing new solutions—such as CLL infrastructure investments—and leading collaborative initiatives—like coalitions committed to purchasing green products—we can identify and address economic and policy barriers to broader adoption. This approach should extend beyond deploying emerging technologies, incorporating early adoption of market-ready solutions to accelerate widespread implementation and serve as a model for others.
- **Engage communities through demonstration:** Foster trust and showcase the social and practical benefits of technological advancements by directly and meaningfully engaging communities in hands-on demonstration projects.
- **Leverage highly visible university platforms for sustainability advocacy:** Harness the influence and reach of outreach-driven units—such as athletics, the health system, and the botanical gardens—as a powerful platform to demonstrate sustainability, promote sustainability initiatives, and drive awareness of environmental goals.
- **Translate research to action:** Translate research insights into practical strategies to help local businesses decarbonize, capitalizing on an untapped opportunity for U-M to support community decarbonization goals. Create a 'Translational Science Communication Lab' to bridge the gap between research, demonstration, and real-world application for external stakeholders and students, while amplifying the visibility and accessibility of campus sustainability expertise. Contribute to the development of state-specific energy policies and decarbonization roadmaps to further support sustainability efforts in Michigan and beyond.

Read all of the comments at myumi.ch/7P1w5.

Event Details

Date & Time: Wednesday, September 25, 2024, 2 - 5:30 p.m.

Location: Palmer Commons—Forum Hall & Great Lakes Room, 100 Washtenaw Ave., Ann Arbor

Agenda & Speakers:

Fireside Chat

Featuring **Shalanda H. Baker**, *Vice Provost for Sustainability and Climate Action*

Hosted by **Jennifer A. Haverkamp**, *Graham Family Director, Graham Sustainability Institute*

Research Community Insights Panel

- **Todd Allen**, *Chair, Nuclear Engineering & Radiological Sciences*
- **Arthur "Skip" Lupia**, *Interim Vice President for Research and Innovation, Office of the Vice President for Research*
- **Shelie Miller**, *Co-Director, Center for Sustainable Systems, School for Environment & Sustainability*
- **Jonathan Overpeck**, *Dean, School for Environment & Sustainability*
- **Kathy Velikov**, *Associate Dean for Research and Creative Practice, Taubman College of Architecture & Urban Planning*

Community Response Conversations

The event featured two sequential Community Response Conversations where attendees shared insights on two key research opportunities: campus as a living laboratory and broader impacts, community benefits & engagement. Campus leaders facilitated these sessions, engaging in informal discussions with attendees.

Broader Impacts, Community Benefits & Engagement Facilitators

- **Liesl Clark**, *Director of Climate Action Engagement, School for Environment & Sustainability*
- **Susan Fancy**, *Associate Director, Global CO2 Initiative*
- **Rob VanRenterghem**, *Partnership Development—Physical Sciences, Innovation Partnerships*
- **Charlene Zietsma**, *Faculty Director, Erb Institute*

Campus as a Living Laboratory Facilitators

- **Alex Bryan**, *Director, Student Life Sustainability*
- **Tony Kolenic**, *Director, Matthaei Botanical Gardens & Nichols Arboretum*
- **Johanna Mathieu**, *Director, Institute for Energy Solutions*
- **Shana Weber**, *Associate Vice President, Campus Sustainability*

Event Co-Sponsors

- Center for Sustainable Systems
- Erb Institute
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- Taubman College of Architecture & Urban Planning