

The MSU Circular Economy Institute

Strategic Plan Theme: Stewardship and Sustainability

Funding Level: Between \$1-5 million

Facility Needs: Adjustments to existing facilities will be needed

Submitting Unit: University Outreach and Engagement/Center for Community and Economic Development

Collaborating colleges/departments/units involved with this proposal.

Current MSU units participating in the Circular Economy Working Group include: • Center for Community and Economic Development • School of Packaging • Supply Chain Management Department • College of Engineering • College of Agriculture and Natural Resources • School of Veterinary Medicine • The School of Hospitality Business • College of Natural Science •

What is the proposal's big theme or idea?

Our current economic paradigm, the linear economy, is built on a take-make-waste model of thinking – essentially a global throw-away society. This strategy is reliant on the continual extraction of resources and short product lifecycles, which normalizes intense waste generation. The linear economy critically lacks coordination between industry sectors, manufacturers and end-users and is increasingly susceptible to economic, environmental, and social disruptions.

The circular economy is a transformative framework for addressing the current disconnect between economic and environmental health and sustainability. Circular practices represent a systemic shift towards long-term environmental, social, and economic resilience local and global by embracing ecological truths, working to, keep materials in use longer, providing end-of-useful-life solutions and enhancing collaboration throughout a product's life cycle. Circularity will be an essential component to address some of the most complex and wicked issues of the 21st century. This paradigm shift has the potential to combat economic instability and social inequalities and will be fundamental in confronting environmental and health concerns, including climate change. Importantly, it addresses our land-grant mission to advance innovative, research-driven activities that “lead to a better quality of life for individuals and communities, at home and around the world”.

Circularity and the related practices of extended producer responsibility (EPR) gaining traction in the United States and across the globe. EPR is a method in which producers take financial responsibility, and sometimes operational accountability, for end-of-life management of their products (Product Stewardship Institution, 2020). Many businesses are beginning to adopt circular strategies that reduce material waste and reduce their carbon footprint. state and local governments have also adopted EPR laws for sustainable manufacturing of various consumer products (Product Stewardship Institution, 2020). Our capacity as a global research, instructional and outreach institution gives us an unprecedented opportunity to lead circularity efforts and activities that identify, discover and disseminate best practices in material waste reduction, salvage and reuse. The proposed Circular Economy Institute will be critical to achieve the goal to maintain a quality environment to foster circularity initiatives needed to assist Michigan industries in competing in the global economy.

What is the proposal's goal?

The Circular Economy Institute (CEI) at Michigan State University, with the advice and guidance of a broad-based consortium representing Michigan's higher education institutions, public and private partners, will undertake innovative and transdisciplinary research, teaching, and outreach efforts on technical, economic, and social impact areas such as material use reduction and product reuse, recycling, and recovery. The CEI will prioritize activities that provide much-needed support to exemplar industries critical to our state's economy such as the automotive, chemical, agri-business and infrastructural materials (built environment) sectors. Strategic advancement will leverage the Institute's consortium in critical topical areas such as materials upcycling and remanufacturing, new product design and development, EPR, business development, materials salvage and recovery, reuse and resale, networking, and public policy. Capitalizing on these strengths, MSU CEI will serve as the central hub, catalyst, and leader of efforts to mitigate the negative social, economic, and environmental impacts associated with the linear economic approach of material use and waste.

Specifically, the CEI will engage a broad sector of faculty and disciplines across MSU to:

- Identify, conduct, and support innovative research with industry, public and non-profit partners on material waste reduction, product reuse, recycling, and recovery with an emphasis on topics important to the state of Michigan.

- Conduct training and provide technical assistance to Michigan industries, public agencies, and other key stakeholders in the implementation of best practices in material waste reduction, product reuse, recycling, and recovery.
- Develop and support professional development opportunities through certificate programs and other appropriate means to improve our circular economy workforce capacity.
- Create a MSU CEI virtual and physical hub and network that will be the guide and link to all faculty, students, staff, industry and stakeholders with the ongoing and future projects, accomplishments, and resources.

Define the significance, or impact of your big idea.

The transition to a circular economy is:

- IMPERATIVE- since our current material use is highly centered on non-renewable resources that are scarcely being recovered.
- NECESSARY- to succeed in a global 21st century economic system that is driven by competition for finite resources and threatens jobs and industries unable to optimize the use of resources.
- URGENT- since all the climate and social indicators are calling for swift and fundamental changes in our current economic systems to reduce the negative consequences of climate change and social inequality.
- STRATEGIC- to establish MSU as a leader in the field of circular economy nationally and globally.

Who will be impacted?

The MSU CEI will provide support to exemplar industries critical to Michigan such as the automobile, chemical, agri-business and structural materials sectors.

The MSU CEI will offer undergraduate, graduate, and postdoctoral study and training opportunities that will enhance their educational experience and ensure the success of the long-term goals of the CEI.

The MSU CEI will create a dynamic and inclusive support network to all the stakeholders working on the intersection of environmental, social, and economic challenges at local and global scales.

What does sustainability for your proposal look like?

The proposed CEI will be charged with advancing research, technical assistance and outreach and education in priority areas such as solid waste reduction, greenhouse gas emissions, reuse, recycling, and recovery. The Institute will guide stakeholders in circularity adoption and will develop the networking and stakeholder capacity needed to build new economic opportunities. By focusing on reducing waste and reducing supply chain vulnerability, Michigan communities will gain access to reliable, high quality and sustainable materials and protect their natural resources. Achieving these goals will positively impact job creation as well as business growth and innovation in the State of Michigan. The benefits of such an Institute would span

environmental, economic, and social areas at a time when public resources are limited, and innovation in local and national circular systems are key to strong, vibrant, and equitable communities.

As a catalyst for innovation and synergistic interactions, the CEI will expand access to federal and state funding grants, foster stakeholders' partnerships and/or memberships, attract donor endowments and generate intellectual property. These assets will support a director, an administrative assistant, student scholarships, postdoctoral fellowships, and endowed chair positions.