

# **The Lansing Tri-County Bio-Manufacturing Feasibility Study**

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Evaluating Regional Capacity and Performance in the  
Emerging Automotive Bio-Manufacturing Sector  
of the Global Bioeconomy

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## **Executive Summary**

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**Fall 2008**

Michigan State University  
Center for Community and Economic Development



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# **THE LANSING TRI-COUNTY BIO-MANUFACTURING FEASIBILITY STUDY:**

**Evaluating Regional Capacity and Performance in the**

**Emerging Automotive Bio-Manufacturing Sector**

**of the Global Bioeconomy**

**September 25, 2008**

### **RESEARCH TEAM**

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Economic Development Administration

## Overview

Communities and companies across the globe are realizing the economic and environmental benefits of “going green” and developing bio-manufacturing processes and commercial products more heavily based on renewable bio-degradable agricultural and natural resource-based products. The Lansing Tri-County Region may be uniquely positioned with its historic competitive advantages in both the manufacturing and agricultural sectors to create jobs and increase wealth in the emerging bio-based economy. The MSU Center for Community and Economic Development Program (MSU CCED) examined the Tri-County Region’s role in the emerging bio-manufacturing sector as part of a project with partial financial support from the U.S. Department of Commerce Economic Development Administration. Bio-manufacturing inputs such as agricultural and natural resource feedstocks, labor and infrastructure and other inputs were examined to assess the feasibility of the Lansing Tri-County Region becoming a leader in the world’s next generation of manufactured products in a post-petroleum economy.

The findings of this feasibility study provide *an evidential base from which communities may make informed decisions about investing in an alternative community and economic development future*. The predictive reliability of a feasibility study is limited in part by the appropriateness of the research methods used, the accuracy of the data analyzed, and the willingness of stakeholders to take informed risks, change behavior and blaze a path into a mostly uncertain future. While every reasonable effort was made to insure, to the extent feasible, a realistic assessment in predicting the future, only one certainty exists and that is the future is ever changing and largely unknown.

The research team sought to improve the reliability of the feasibility study by utilizing a previously developed feasibility model in a new emerging industry sector while incorporating some of the more traditional elements of business feasibility studies employed by planners and economic developers.<sup>1</sup> In addition, the research team relied on the on-going advice and guidance of a Project Technical Advisory Committee and routinely sought the consultation and advice of

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<sup>1</sup> *Linking Knowledge and Resources to Support Michigan’s Bioeconomy*. Report prepared by the Centrec Consulting Group for the MSU Product Center for Agriculture and Natural Resources. November 2006.

scholars, industry leaders and community leaders as questions were identified and data and information were gathered, sorted and interpreted.

The study is divided into seven sections. After the introduction (Section 1), the study describes and examines the following:

- Tri-County Regional Demographic and Employment Profile
- Agricultural/Natural Resources/Environmental Profile
- Industrial and Infrastructure Capacity
- Intellectual Capabilities
- Leadership Commitment

The report concludes with this Executive Summary and Recommendations (Section 7 in the full report).

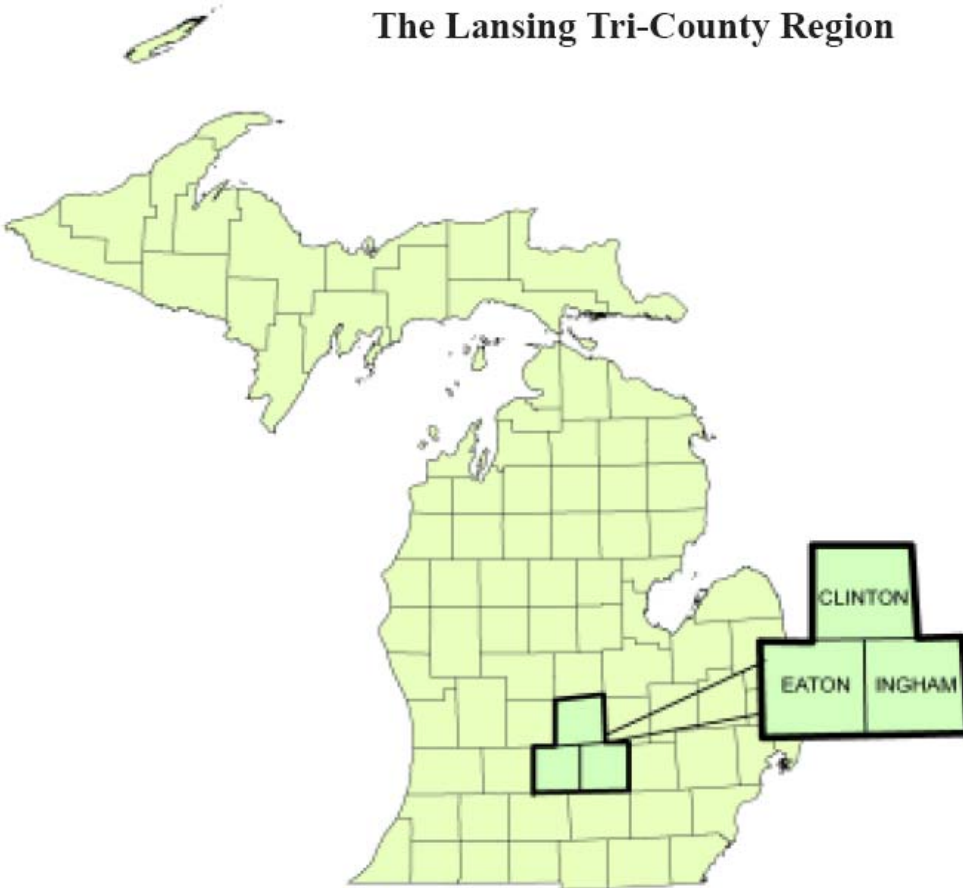


Figure 1  
Source: MSU Center for Community & Economic Development

## **Key Performance Factors in the Emerging Bio-Manufacturing Sector of the New Global Bioeconomy**

Relevant U.S. and international cases were studied, particularly those from the European Union. Bio-manufacturing research, industry definitions, principles and products for automotive bio-manufacturing were reviewed to identify current industry standards and evaluate market potential. Global firms engaged in automotive bio-manufacturing production were studied to identify their production inputs, products, and supply chains. Key levels of inputs needed for bioproducts including agricultural and other natural resource inputs, labor skills, infrastructure, technology transfer and others were then benchmarked and the Tri-County Region's performance for each factor was assessed to determine the feasibility of bio-manufacturing in the region (MSU Office of Bio-Based Technologies, 2006).

The region's strengths and weaknesses were determined for five key performance factors in the bio-manufacturing sector of the bioeconomy and 17 indicators based on the evaluation and analysis of information generated from an extensive literature review, over 35 key informant interviews, and periodic reviews by the technical advisory committee. The following matrix summarizes the findings for the region's capacity and performance in the emerging bio-manufacturing sector. A green up arrow indicates a strength; a down red arrow indicates a weakness, and a yellow square indicates that the data was inclusive for that particular benchmark. Preliminary findings of the study were filtered through the Technical Advisory Committee before the findings were finalized. These findings for the 17 key indicators are presented in the Summary of Findings on the next page. The recommendations to regional leaders and stakeholders interested in bio-based economic development were informed by these findings.

## Evaluating Regional Capacity and Performance in the Emerging Automotive Bio-Manufacturing Sector Summary of Findings

Key Performance Factor/Indicator	Finding
<b>Market and Growth Potential</b>	
Adequate supplier base with the ability to manufacture bio-based products (Section 1.5).	▲
Strong potential regional market to support the production of bio-products for the automotive industry and other sectors (Section 1.5).	■
<b>Agriculture/Natural Resources/Environment</b>	
Crops with adequate harvest of necessary bio-manufacturing feedstocks (Sections 3.2 and 3.3).	▲
Cellulosic biomass from forest and other resources for biofuels and bio-products (Section 3.4).	▼
Adequate supply of other cellulosic materials, such as corn stover or other non-food source feedstocks (Section 3.4).	▲
A temperate climate that fosters a relatively stable growing season and crop quality while supporting bio-manufacturing related crops (Section 3.5).	■
<b>Industrial and Infrastructure</b>	
Ability to collect and handle biomass within a reasonable distance to support bio-manufacturing production (Section 4.4).	▲
10 or more acres of industrial or other land for a biorefinery (Section 4.4).	▲
Access to road and rail transportation for feedstock and product shipments to and from bio-manufacturing production facilities (Section 4.5).	▲
Skilled manufacturing labor workforce with the training and abilities to compete in the emerging bio-manufacturing sector (Section 4.5).	▲
<b>Intellectual Capabilities</b>	
Strong university and community college faculty capacity that supports bio-manufacturing knowledge generation and technology transfer (Section 5.2).	▲
University and community college research commitment and successful technology transfer (Section 5.2).	■
<b>Leadership Commitment</b>	
Available private sector and public financing in place that supports bio-manufacturing facilities and production (Section 6.2).	▼
Public sector commitment at the local level – planning, economic development and other public policy that fosters bio-manufacturing growth (section 6.3).	▼
Higher education commitment at administration level to local and regional bioeconomy development (Section 6.3).	▲
A bioeconomy industry network that fosters bio-manufacturing sector growth and facilitates bioeconomy cluster development in the Tri-County Region (Section 6.5).	▼
Private sector acceptance, innovation and leadership (Section 6.5).	■

▲ Regional Strength

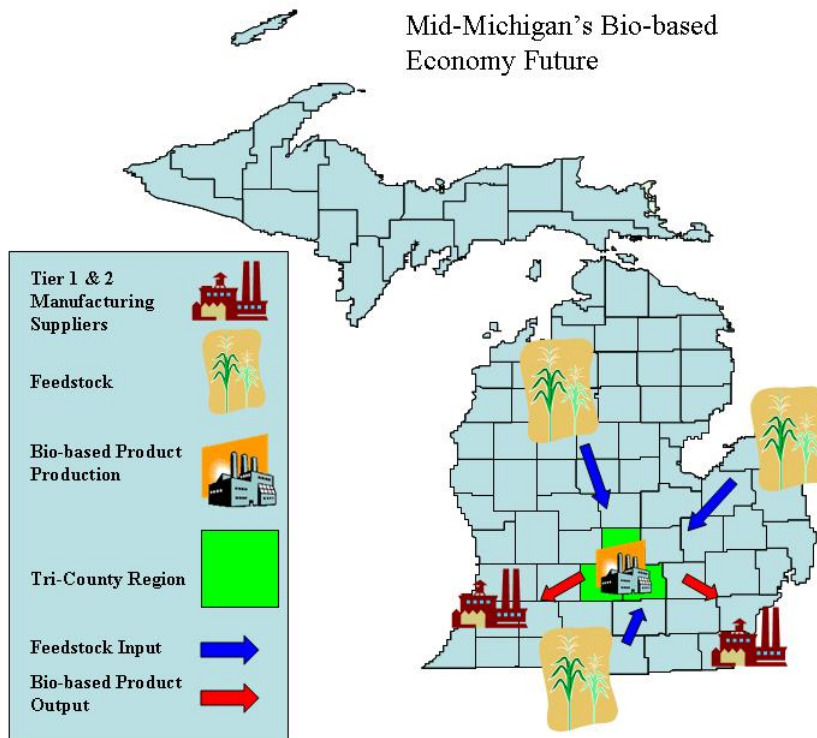
▼ Regional Weakness

■ Inconclusive Data

## Assessing Greater Lansing’s Position in the Emerging Automotive Bio-Manufacturing Sector

MSU CCED analysis shows that the Lansing Tri-County Region has the potential to compete successfully in the emerging bio-manufacturing sector, given its manufacturing strength, agricultural roots, skilled labor force and unparalleled higher education research dedicated to advancing the bio-manufacturing sector. A well-developed network of automotive, chemical, plastics and related manufacturing firms and suppliers could respond to market demand for bio-manufacturing products made in the region with stronger public and private-sector leadership willing to adopt policies and business models that emphasize the use of green bio-based products.

The region’s bio-based manufacturing economy would be structured on the availability of various necessary inputs and markets in addition to required infrastructure. Readily accessible feedstock can be grown on agricultural land in the region to provide these inputs without incurring excessive transportation costs given their relatively close proximity. The Tri-County Region’s centralized location, available trained workforce, access to knowledge and innovation, existing infrastructure and industrial facilities provide an effective center to collect and process feedstocks into bio-based products. The central location allows for efficient distribution of these bio-based products to other regional automotive manufacturing centers and associated tier one and tier two automotive manufacturing suppliers.



The Lansing Tri-County Region has many key components needed for a successful regional bio-manufacturing cluster. The region has strength in its relative proximity to bio-manufacturing feedstock such as corn and soybeans as well as non-food feedstocks like corn stover and wood residues compared to other regions in the state. The region also enjoys an unparalleled advantage statewide and nationally with its manufacturing and transportation infrastructure.

The capacity of the region to successfully create and sustain a bio-manufacturing economy will depend on our inventive and intellectual abilities to develop new methods of production, products, and markets. The global bio-manufacturing sector is evolving quickly with the rapidly-changing global knowledge economy. Communities that are early adopters will face significant “start-up challenges” but have potential to become bio-manufacturing economic centers positioned to grow and expand in the years ahead.

The Lansing Tri-County Region also has challenges, including the following:

- Underdeveloped regional market to support the production of bio-products for the automotive industry and other sectors;
- Lack of cellulosic biomass from forest resources for biofuels and bio-products;
- Lack of available private sector and public financing in place that supports bio-manufacturing production and facilities;
- Lack of full public sector commitment at the local level planning, economic development and other public policy that fosters bio-manufacturing growth; and
- Lack of a bio-manufacturing industry network to foster the growth of the bio-manufacturing sector and facilitate bio-manufacturing cluster development in the region.

Strategic repositioning of regional resources and capacity can effectively answer these challenges.

There are three other areas for which the data are inconclusive, including a relatively short growing season, competitive technology transfer capacity, and demonstrated leadership capacity.

Technology-led economic development offers the potential of great wealth generation for those individuals and communities who are creative and talented, and have a modern IT infrastructure and the foresight to plan for the New Economy. Many “university town” areas like the Lansing Tri-County Region are exceptionally well-positioned to compete successfully in the New Economy as a result of a long history in making public and private investments in the generation and application of knowledge a top priority. The region’s outstanding research and development capacity, then, can facilitate and support critical leadership in the technology-led knowledge economy. However, the region must actively demonstrate boldness in the public and private sectors to take risks necessary to advance the early development of a new bio-manufacturing sector and successfully compete in the emerging knowledge-based global bioeconomy.



## Project Recommendations

Based on the analysis of the feasibility study and the summary matrix presented above, the research team recommends the following actions to the leadership of the Lansing Tri-County Region:

- **Establish a Lansing Tri-County Region bio-manufacturing industry network that includes private sector leaders from the manufacturing and agricultural crop production sectors with the participation of the region’s higher education institutions and regional economic development organizations** The Tri-County Region Bio-manufacturing Network would:
  - **Work with companies in the automotive, agricultural, energy and chemical sectors to identify opportunities that advance the development of bio-products and bio-manufacturing in the region.**
  - **Partner with the research community to identify research needs associated with the development of bio-products and bio-manufacturing processes.**
  - **Identify and access funding to promote innovation in bio-products and bio-manufacturing.**
  - **Facilitate the provision of a skilled workforce with the training needed to support the bio-manufacturing industry,**
  - **Identify companies interested in making immediate investments in the development and marketing of bio-products,**
  - **Work with local economic development officials on initiatives to support bio-manufacturing processing improvements, pilot scale production, testing and evaluation, commercial-scale production, and market development of regionally-produced bio-products.**
  - **Assist small and medium size businesses in evaluating the performance of new regionally-produced bio-products.**
- **Work to educate public officials and policymakers about the emerging bio-manufacturing sector so that sound planning and economic development decisions are supported consistent with the growth of a bio-manufacturing sector in the region.**
- **Formulate strategies to raise private-sector capital and leverage the capacity of the new regional bio-manufacturing industry network to administer community financing efforts and establish a regional bio-manufacturing cooperative.**

The Lansing Tri-County Region’s strengths in traditional manufacturing, agriculture commodity crop production, and dedicated bioeconomy research provide the region with important assets that can be used to compete successfully in the emerging bio-manufacturing sector. A collaborative public-private partnership to leverage strengths while working to fortify areas of regional weaknesses can help integrate the region’s agricultural, manufacturing and intellectual assets and ensure that the region competes successfully in the emerging bio-manufacturing sector.

The research team expresses its sincere thanks to our collaborating partners and supporters who assisted the development of this feasibility study, and already provide committed leadership to grow a strong Lansing Tri-County Region bioeconomy. As we work creating, disseminating, and applying knowledge to improve quality of life and capture the region's full economic potential, we are very appreciative for the invaluable support of those who shared their expertise and insights in striving to create a strong and vibrant regional economy that balances the environmental, social and economic domains in seizing new opportunities for regional growth. Our collaborative partners and supporters play integral roles in our ability to effectively implement, evaluate, and communicate innovative approaches through responsive engagement, strategic partnerships, and collaborative learning.

As the Lansing Tri-County Region continues to cultivate the development of a regional bioeconomy, we hope that the findings and dialogue instigated by this feasibility study spur strategic partnerships that are critical to the future of the region in the global bioeconomy.

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