Overall Institute

10+ New products commercially available because of IACMI collaboration

$400M Investment in eight states

3,000 Jobs announced

Case Study

Techmer PM and Local Motors IACMI technical project example

"Our participation in IACMI allowed us to develop new technologies that have contributed to Techmer PM's growth in the additive manufacturing ecosystem."

Tom Drye, Vice President of Emerging Markets & Innovation and Application Development, **Techmer PM**

Challenge

Improve the material options and printing processes for additive manufacturing (3D printing) that enables Local Motors to commerically produce its 3D printed vehicles

Objectives

- Increase the variety of materials available for additive manufacturing
- Better understand 3D printed materials' properties to make reliable manufacturing decisions

Impact

Significant commercial growth for multiple companies involved in the project

Techmer PM

- Techmer PM has had significant sales of new 3D products and expects to double sales in 2019
- Techmer PM is helping lead the growth and acceptance of large part additive manufacturing through materials designed specifically for optimum performance and reliability in additive manufacturing
- Customer demand is driving installation of a new multi-million dollar manufacturing line to meet the increased 3D materials need of Techmer's customers

Local Motors

- Local Motors installed the world's largest 3D printer, made by Thermwood, at its Knoxville, TN microfactory
- Local Motors to commercially produce Olli 2.0 at Knoxville, TN microfactory beginning in July 2019

IACMI – The Composites Institute
www.iacmi.org
2360 Cherahala Blvd.
Knoxville, TN 27932

University, State, Regional, National Laboratory, & Association Partners

The Institute for Advanced Composites Manufacturing Innovation (IACMI), managed by the Collaborative Composite Solutions Corporation (CCS). CCS is a not-for-profit organization established by the University of Tennessee Research Foundation. As a Manufacturing USA institute, IACMI is supported the U.S. Department of Energy's Advanced Manufacturing Office in the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE).

IACMI – The Composites Institute®

Institute Outcomes

March 2019

IACMI – The Composites Institute is a 160+ member community of industry, academia, and government agencies leading innovation and workforce development initiatives to drive the adoption of advanced composites to grow U.S. manufacturing and support national security. IACMI, a Manufacturing USA institute, is supported by the U.S. Department of Energy's Advanced Manufacturing Office, as well as key state and industry partners.

Advanced composites provide strength and stiffness while being very lightweight. These characteristics provide advantages in many transportation, energy, and infrastructure applications. Greater deployment of advanced composites can offer benefits, such as providing safer, more energy-efficient vehicles. IACMI is working to drive the large-scale adoption of advanced composites in diverse markets.

Connecting innovation and workforce development

IACMI is uniquely and systematically connecting innovation and workforce assets across multi-billion dollar industries positioned for significant future domestic and international growth. IACMI will make the U.S. a leader in the manufacture of these strategic materials and accelerate the growth of their markets.

Creating a collaborative ecosystem

IACMI is creating a community throughout the composites supply chain, including support for small and medium enterprises (SMEs). More than 50% of IACMI members are SMEs, leveraging their unique specializations to collaborate with one another, larger organizations, and technical experts.

Building supply chain-based frameworks for decision making

IACMI provides production-relevant environments for innovation, establishes supply-based frameworks for decision making, and trains the workforce in support of the needs of the composites industry.

Driving economic growth

Through IACMI projects, member companies have developed new, commercially available products. These products have helped lead to job creation, facility expansion, and economic growth for the companies, as well as their manufacturing partners. IACMI has created an ecosystem of innovation that meets commercial needs, serves national security, and drives national economic growth.

IACMI – The Composites Institute creates an **ecosystem of innovation** to drive **commercial outcomes** that lead to **economic growth**.

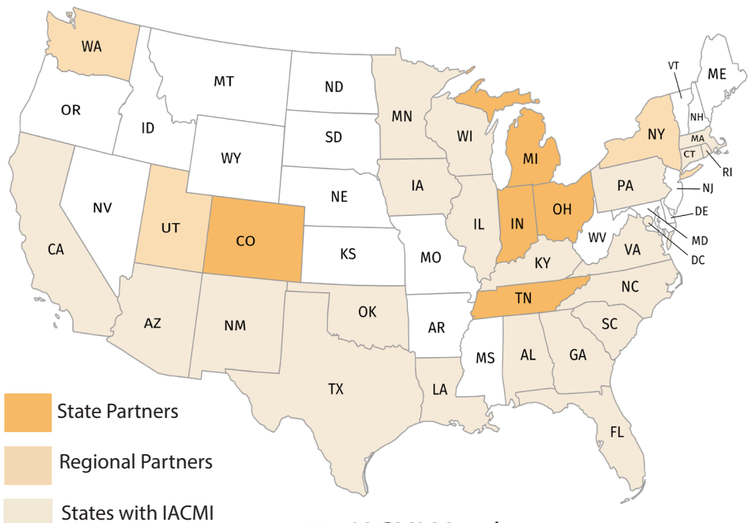
The IACMI consortium consists of more than 160 members and is a proven collaboration framework for catalyzing innovation and workforce development outcomes. IACMI projects are addressing national interests in energy and manufacturing competitiveness, training the next generation workforce, creating new commercial products and markets, and driving economic growth.

50+ IACMI technical projects

90 IACMI members participating on technical projects

$70M+ IACMI's R&D value to date

Creating an Innovation Network



160+ IACMI Members
- 130 industry members
- 53% of companies are SMEs

10+ New products commercially available because of IACMI collaboration outcomes

Driving Commercialization

Saving cost through rapid curing	**New rapid curing prepreg & sheet molding compound:** Dow VORAFUSE™ P6300 Dow VORAFUSE™ M6400 New vinyl ester resins: Ashland Arotran™ 901 Ashland Arotran™ 902
Extending product longevity	**Stronger thermoplastic resins:** Arkema Elium™ 188
Creating efficient manufacturing technologies	**Reduce manufacturing waste:** Fibrtec FibrFlex™ & Dupont Rapid Fabric Formation **Scale-up novel technology:** N12 NanoStitch ® **Compounds for large scale 3D printing:** Techmer PM HIFILL™ & Electrafil™
Increasing recyclability applications	Vartega recycled carbon fiber continuous filament for 3D printing CRTC recycled carbon fiber park fixtures

Serving Workforce Needs

100 Internship placements

2,000 Composites training participants

9,000+ K – 12 Student STEM participants

Impacting Economic Development

Growing Advanced Composite Markets

$400M Investment in eight states

3,000 Jobs announced

"Leisure Pools anticipates employing 1,000 at factory in Forks of the River Industrial Park"
Knoxville News Sentinel

"N12 Technologies and University of Dayton Research Institute Partner to Enable High Production Capacities of NanoStitch®"
BusinessWire

"The Composite Recycling Technology Center is now taking orders for the world's first park bench made from recycled aerospace grade carbon fiber"
CompositesWorld

Building Industry Workforce

100% IACMI interns who graduated with a job offer in industry or acceptance into a graduate program

Meeting U.S. Dept. of Energy Goals

Successfully meeting goals for national security interest:

Demonstrate greater than 80% recyclability of polymer composites

Reduce production costs of carbon fiber composites by over 25%
Reduce embodied energy of carbon fiber composites by 50%

Achieve large-scale adoption of innovative material and manufacturing technologies

Establishing a foundation for economic growth through a strong collaboration network, manufacturing innovations, and workforce training.