IACMI FACILITIES SERVE THE COMPOSITES SUPPLY CHAIN

modeling & simulation

IN: **Indiana Manufacturing Institute**
Developing comprehensive set of simulation tools to model composites structures from manufacturing to end-of-life product cycle

TN: **Laboratory for Systems Integrity and Reliability at Vanderbilt University**
Combines modeling and simulation tools, sensing and control techniques, and risk and reliability analytics to improve performance and dependability of manufacturing systems

MI: **Composite Materials and Structures Center at Michigan State University**
Leading facility in polymer composite research with latest equipment and instrumentation for studying composite manufacturing, performance, and durability

KY: **Carbon Fiber Spinline Laboratory**
Largest spinline in an academic setting which produces research quantities of precursor tow

OH: **Composites Laboratory at UDRI**
Features full-scale manufacturing work cells and small business incubation

testing business viability

prototyping & testing

TN: **Carbon Fiber Technology Facility at ORNL**
Offers flexible, instrumented carbon fiber line for demonstrating advanced technology scalability

CO: **Composites Manufacturing and Education Technology Facility (CoMET) at NREL**
Enables design, prototyping, testing, and manufacturing of composite wind turbine blades

TN: **Fibers and Composites Manufacturing Facility at the University of Tennessee, Knoxville**
Allows students and researchers to work through complete composite manufacturing process, collaborating with industry for problem solving, testing, and product development

TN: **Manufacturing Demonstration Facility**
Collaborates with industry to reduce risk and accelerate development and deployment of energy-efficient manufacturing processes and materials

full-scale production implementation

MI: **Scale-Up Research Facility (SURF)**
Production-scale composites manufacturing equipment, with a focus on lightweighting

UNIVERSITY & STATE PARTNERS

Find out more at iacmi.org

IACMI – THE COMPOSITES INSTITUTE

RESULTS & OUTCOMES

JANUARY 2019



$25.2 BILLION:
Composites' annual contribution to the U.S. economy
Source: ACMA 2019 Industry Report

160+ IACMI MEMBERS
50%+ Small & Medium Organizations

Member Industries Represent:
- Automotive
- Wind Energy
- Compressed Gas Storage
- Aerospace
- Marine
- Oil & Gas
- Infrastructure
- Consumer Products
- Composites Recycling

IACMI – THE COMPOSITES INSTITUTE: DRIVING THE ADOPTION OF ADVANCED COMPOSITES

IACMI – The Composites Institute improves U.S. security and manufacturing competitiveness by

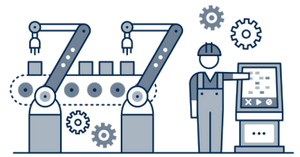
1. providing production-relevant environments for innovation,
2. establishing a supply-based framework for decision making, and
3. training the workforce in support of the needs of the advanced polymer composites industry.

More than **600 companies** are represented by IACMI member trade organizations: the American Composites Manufacturers Association (ACMA) and the American Chemistry Council (ACC). 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 in the acceleration of the growth of their markets.

"The IACMI consortium has been an effective way for industry, universities, and federal laboratories to **collaborate on industrially-relevant technology**."
– Joe Fox, Ashland Composites |
2018 Innovation Policy Forum at the National Academy of Sciences

IACMI CREATES A COLLABORATIVE PATH FOR GLOBAL COMPETITIVENESS

160+ MEMBERS



Driven by industry needs

University research for collaboration & validation

Public/private partnership with federal, state, & industry support

BY ESTABLISHING SUPPLY-BASED FRAMEWORKS FOR DECISION MAKING

Fostering innovation to drive productivity, growth, & value

IACMI hosts bi-annual members meetings in its partner states of **Michigan, Colorado, Ohio, Tennessee, and Indiana** to showcase technical advancements in IACMI projects, facility tours and updates, workforce initiatives, and member successes. **On average, each meeting brings in over 320 attendees from IACMI member organizations representing on average more than 30 states.**

96% of surveyed attendees from the Winter 2018 Members Meeting reported the meeting resulted in a new business opportunity

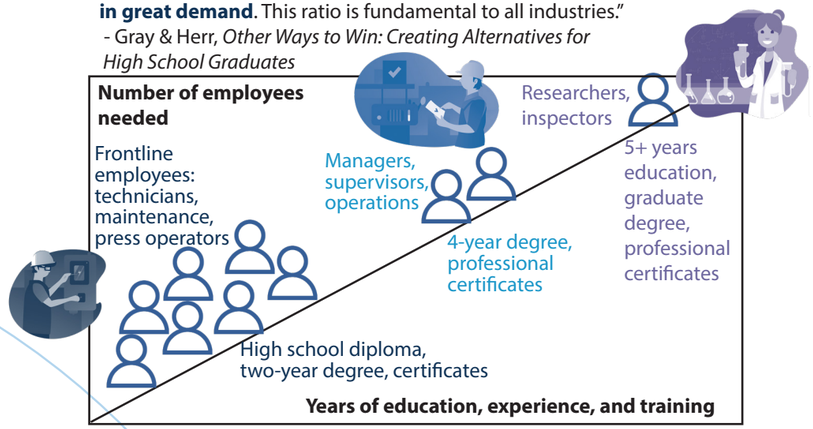
50+ Technical research & development projects underway, in contracting, or completed

90 IACMI members participating on research & development projects

$70Million
IACMI's R&D value

WITH THE WORKFORCE TO MEET THE CRITICAL NEED SKILLS GAP

"For every occupation that requires a master's degree or more, two professional jobs require a university degree, and there are **over half-a-dozen jobs requiring a one-year certificate or two-year degree**; and each of these technicians are in very **high-skilled areas that are in great demand**. This ratio is fundamental to all industries."
- Gray & Herr, *Other Ways to Win: Creating Alternatives for High School Graduates*



IACMI supports industry workforce needs

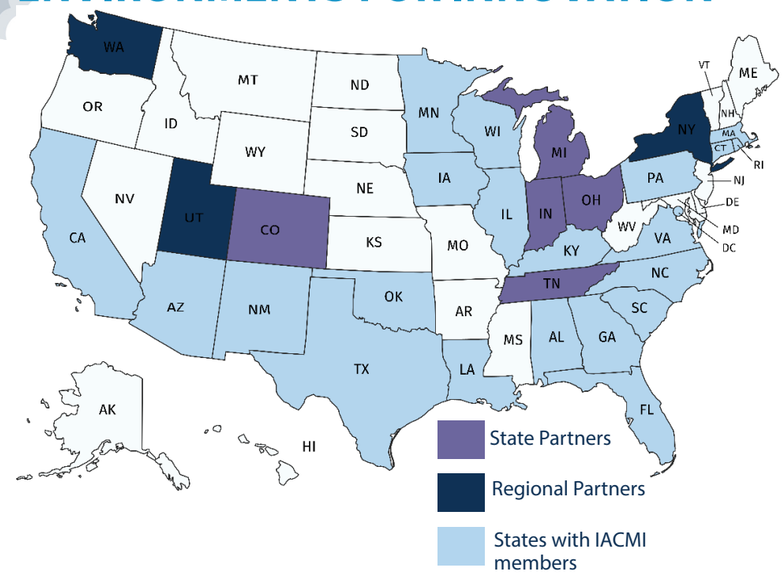
100 INTERNSHIP PLACEMENTS

2,000 COMPOSITES TRAINING PARTICIPANTS

9,000+ K – 12 STUDENT STEM PARTICIPANTS

600 TRAIN-THE-TRAINER PARTICIPANTS

AT PRODUCTION-RELEVANT ENVIRONMENTS FOR INNOVATION



Shaping the manufacturing narrative

Inc. America Can Win Manufacturing in the 21st Century: Here's How

"You have to create an **environment in which people can feel confident in sharing information and insights**, while at the same time protecting interests of all sides, especially with regard to intellectual property. Once you build that community, we have found that **unanticipated synergies can be unlocked.**"
– IACMI CEO, John A. Hopkins in Inc.com article March 10, 2018

Forbes Michigan's New Governor Can Accelerate the Auto Industry's Transformation

The industry is on the cusp of a light-weighting and multi-material revolution. Detroit hosts two public-private partnerships under the Manufacturing USA initiative that could, with the right direction, be the epicenter of many industry lightweight innovations. – Forbes, Nov. 13, 2018

Inc. 3 Technologies You Need to Start Paying Attention to Right Now

Materials Science: "How do you significantly increase the performance of an airplane?...By discovering new composite materials, [Boeing] was able to ***reduce weight by 40,000 pounds and fuel by 20%***."*–Inc.com article, Jul. 8, 2017*

America's Infrastructure Scores a D+

American Society for Civil Engineers 2017 Report Card for America's Infrastructure

Composite products produced in the U.S. offer durable, sustainable, and cost-effective solutions in infrastructure applications

American Coatings Association™

"One provision of the [IMAGINE Act] would call on the Transportation Secretary to form innovative material hubs throughout the country to continue to drive research into and development of innovative materials for use in infrastructure projects. The provision was inspired by the success of communities of materials manufacturers – like advanced composites makers in Rhode Island and the Institute for Advanced Composites Manufacturing Innovation in Knoxville, Tennessee – that have leveraged their innovations and expertise to grow their industry." – American Coatings Association discussing support for the Innovative Materials for America's Growth and Infrastructure Newly Expanded (IMAGINE) Act