



Convene. Connect. Catalyze. Institute Outcomes in Tennessee

Driving innovation in advanced composites through networking, collaboration and workforce development

April 2023



IACMI Receives Funding Renewal from the U.S. Department of Energy

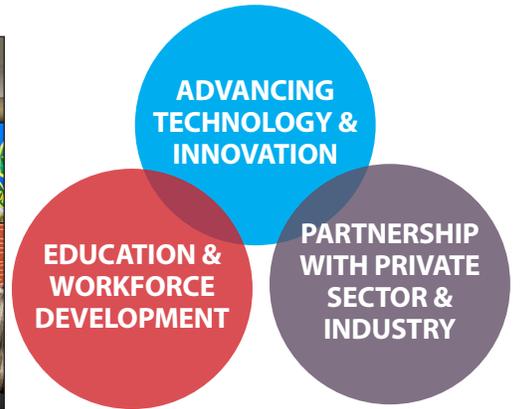
The Institute for Advanced Composites Manufacturing Innovation® (IACMI), headquartered in Knoxville, Tenn., has become the first Clean Energy Institute to receive a funding renewal from the Department of Energy (DOE). Five years of funding will be invested to further technological R&D and accelerate commercialization in the domestic composites manufacturing sector. This federal funding builds upon initial institute funding of \$70 million from DOE and over \$130 million from IACMI's 120+ member partners.

Tennessee is one of the largest manufacturing regions in the U.S. The state's strong manufacturing and advanced materials eco-system helped lay the foundation for the creation of IACMI. Years of hard work innovating and then demonstrating the benefits, opportunities, and sustainability of composite materials are paying off and taking the composites industry in exciting directions in the state.

"Today, I am thrilled to announce DOE is extending our partnership with a continued investment over another five years. The ideas, the partnerships, the passion blooming throughout IACMI has made it an innovation incubator for some of America's sharpest minds and most creative thinkers."

—DOE Secretary Jennifer Granholm in taped remarks

IACMI has served 35+ member facilities in the state. Tennessee ranks the highest state in the U.S. for job growth within the advanced materials industry, and more than 153,000 Tennesseans are employed by advanced manufacturing establishments.





IACMI - The Composites Institute creates an **ecosystem of innovation**...



Serving Workforce Needs In Tennessee

2,400 Manufacturing Job Commitments in TN by IACMI members & partners

7,000+ K-12 STEM participants in Tennessee supported by IACMI

400+ Adult composites training participants

500+ University students engaged in advanced material research and experiential learning activities

34 Internship placements

100% Interns graduated with a job offer or acceptance into a graduate program

Former Interns Making an Impact



Alix Ambross (UTK Mech/Aerospace 2018) OD Engineer, FedEx, Memphis



Will Henken (UTK Civil Engineer PhD 2024) VW Fellow, Fiber Sizing, Volkswagen of America, Knoxville



Disrupting U.S. Transportation and Infrastructure Markets

A 16-foot composite bridge in Morgan County, TN with a 100-year life span is getting a lot of attention. The first vehicular composite bridge constructed in Tennessee is a collaborative effort by IACMI, Composite Applications Group (CAG), Structural Composites, the University of Tennessee, and a team of Tennessee-based companies. In less than a day in February 2021, two eight-foot, pre-manufactured, composite bridge decks were installed. The bridge deck is 90% lighter than concrete, can be manufactured off-site, transported to the site – all while reducing energy and construction costs. A team of UTK researchers and students collaborated with Luna Innovations to equip the bridge with sensing equipment that tracks performance data every time a vehicle crosses, including a school bus

which uses the bridge daily. These data can easily scale to much larger bridges. In 2023, CAG is working with DOT officials in multiple states to explore replacing crumbling rural bridges just like this one.

“Advanced materials, composites, and manufacturing techniques are driving a new industrial

revolution and Tennessee is playing a lead role. If we are going to repair crumbling bridges, we don't need to do it the old way. We need to use new, advanced

technologies that speeds up construction, creates American jobs, and brings a durable infrastructure solution.”



JEFF MCCAY
PRESIDENT, COMPOSITE APPLICATIONS GROUP

Jeff McCay, CEO & President
Composite Applications Group
McDonald, Tennessee

Creating Next Generation Workforce

“Now, this is cool!” That’s eighth grader Isabella’s response as she performed a little polymer magic – piercing a balloon with a wooden skewer. Isabella is among 700 middle schoolers in East Tennessee who are participating in SkillCrafters. Sponsored by the Defense Department, the IACMI-led workforce initiative engages and challenges students to know more about advanced composites materials, their processes, and how they impact our world today. IACMI has teamed up with Junior Achievement of East TN. The students

take field trips, research real-world problems, prepare solutions using composite materials and pitch their ideas to a panel of industry experts.



... to drive **commercial outcomes** that lead to **economic growth.**



Innovation South TN Research Park

- IACMI's collaboration and impact in Tennessee will expand in 2024 by co-locating with new start-ups and members such as CAG and Endeavor Composites, in Innovation South at UT Research Park at Cherokee Farm in Knoxville.
- 65,000-sq-ft lab** for the Fiber and Composites Manufacturing Facility.
- Led by **Dr. Uday Vaidya**, UT/ORNL Governor's Chair in Advanced Composites Manufacturing.



"IACMI has been instrumental in bringing new manufacturing companies to Tennessee and connecting them with member companies and partners. IACMI is a vital asset for any company looking to enter or grow their business needs in composites or other areas related to the EV markets and construction."

Dale Leftwich,
Business Development Manager,
JR Automation, Nashville



IACMI and founding partners, the University of Tennessee and Oak Ridge National Laboratory, have a long history of materials innovation and collaborating with industry partners to develop complementary manufacturing processes, improve processes through digital tools, and validate forms necessary for translation into large-scale commercial deployment.

Tennessee facilities within the IACMI Network



Fiber and Composites Manufacturing Facility

Enables researchers and students to work on the complete composite manufacturing process and supports collaboration with private industry for problem solving, testing and product development.



Manufacturing Demonstration Facility

Industry collaboration to reduce risk and accelerate development and deployment of energy-efficient technologies.



Carbon Fiber Technology Facility



Offers flexible, instrumented carbon fiber line for demonstrating advanced technology scalability.



Laboratory for Systems Integrity and Reliability

Combines modeling and simulation tools, sensing and control techniques, and risk and reliability analytics to improve performance and dependability of manufacturing systems.





ACE
AMERICA'S CUTTING EDGE

Tennessee Home to America's Cutting Edge National Machine Tool Research & Training Programs

ACE Vital to a Robust U.S. Machine Tool Pipeline

America's Cutting Edge (ACE), an IACMI-led industrial training program launched in Knoxville in 2020, is helping to bolster the manufacturing industry across Tennessee and the United States.

ACE, a national initiative for machine tool technology development and advancement, uses free online and in-person, hands-on training.

To date, 4,000+ people from across the U.S. have engaged with ACE online training modules, including participants



U.S. Sen. Blackburn at ACE Training at Oak Ridge High School



from all 50 states. Almost 1,000 of the online ACE registrants are from the state of Tennessee. Of the 350+ persons who have completed weeklong ACE in-person bootcamps, more than 200 attended training in Tennessee at UT, ORNL's

Manufacturing Demonstration Facility, Pellissippi State Community College, Roane State Community College and Oak Ridge High School.

Sponsored by the Defense Department, ACE brings together the scientific expertise of ORNL's Manufacturing Demonstration Facility and the proven workforce development capabilities of IACMI. The ACE national CNC machining training program has been developed by University of Tennessee Professor Tony Schmitz.

Visit www.AmericasCuttingEdge.org to learn more.



Defense Industrial Training: The Power of Collaboration

TN SPINOFFS & STARTUPS

New companies crediting IACMI with startup or relocation to Tennessee include:

- Magnum Venus Products
- Carbon Fiber Recycling
- Carbon Rivers
- Windfall
- Endeavor Composites
- Vitriform3D
- Orbital Composites plans to expand to Knoxville in 2023



VITRIFORM3D
RECYCLED GLASS 3D PRINTING



IACMI – The Composites Institute

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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).