

## A DECADE OF INNOVATION *IACMI's Impact*

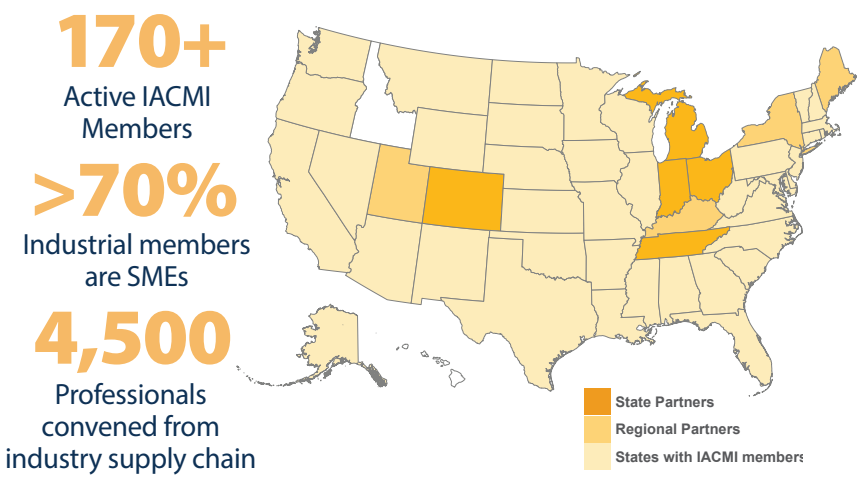






# Economic Growth

For 10 years, IACMI has implemented a formula that works. **Technical Innovation + Workforce Development = Economic Growth.** IACMI has catalyzed the creation of research-at-scale, production-relevant, shared spaces for innovation and workforce development. **Who We Are:** A Manufacturing USA institute with a 170+ member community of industry, academia, national laboratories, and government agencies



- ### Benefits of Composites
- ✓ Enhanced Strength and Durability
  - ✓ Lightweight and Stiff Performance
  - ✓ Corrosion Resistance
  - ✓ Aesthetics and Design Flexibility
  - ✓ Versatility in Transportation, Energy, and Infrastructure

**Advanced composites can make aerostructures lighter, cars safer, and bridges last longer.**

**“Discussions through IACMI trigger thoughts, help connect and formulate relationships. IACMI helped us understand customer pain points and the need for scale.”**

—Kevin Retz, NAWA America  
 NAWA H



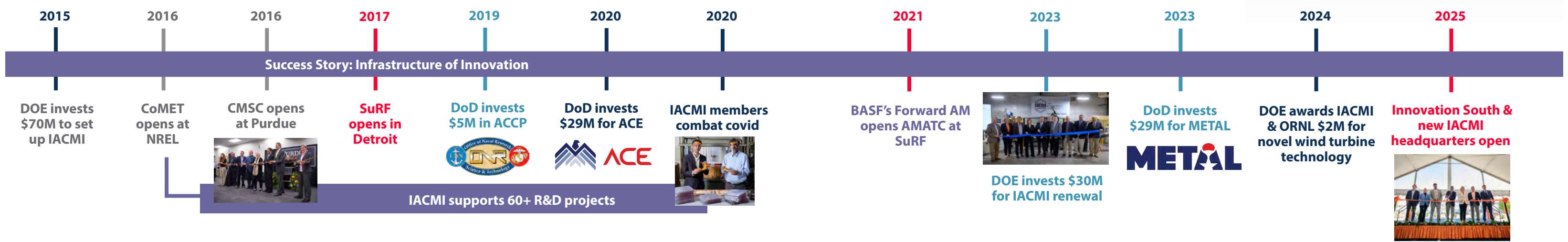
### SUPPORTED BY



IACMI was established in 2015 and renewed in 2023 by the Advanced Materials & Manufacturing Technologies Office (AMMTO) in the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE).



Since 2019, IACMI has scaled up workforce programs for the U.S. Department of Defense including for the Industrial Base Analysis and Sustainment (IBAS) program within the Innovation Capability and Modernization (ICAM) office.



**Impacting Economic Development Across the U.S.**

**\$400M** Value of scale up facilities across 8 states

**3,000** new manufacturing jobs announced

**\$150M** in Research & Development value



# Public-Private Collaborations



**“IACMI has a collaborative culture that increases the speed of innovation.”**

—Steve Bassetti, Michelman  
**MICHELMAN**



**W**hat happens when IACMI *convenes, connects, and catalyzes*? Effective collaborations. Networking is the heart of IACMI’s purpose, bringing together 4,500+ people through Members Meetings. Members and IACMI technical experts tackle the composites industry’s toughest challenges through Working Groups focused on key sectors. Together, members forge partnerships, create new supply chains, and build an ecosystem of innovation.

**IACMI has created an ecosystem where Small Medium Enterprises (SMEs) can thrive.**

- ✓ Visibility, exposure to OEMs through projects
- ✓ Access to expertise and specialized equipment
- ✓ Help navigating the “valley of death”
- ✓ Cost-effective demonstration projects
- ✓ De-risking of new technology
- ✓ Validation of business models
- ✓ Recognition and awards

Relationships  
Navigating the Valley of Death Leads Cooperative Competition Exposure  
De-risking **Collaboration**  
**Networking**  
leaving resources Partnerships  
New Opportunities

## IACMI Working Groups

Robust model of involvement for members



High Rate Aerostructures Fabrication



Future Mobility/Vehicles Technology



Wind Energy



Infrastructure and Construction



Recycling/Circular Economy

COLLABORATIONS

2016-2017

2017

2019

2019-2021

2020

2020

2021

2022

2024

Success Story: Additive Manufacturing of Composites and Tooling

IACMI project with ORNL and Local Motors enhances BAAM



ORNL 3D prints tooling with Techmer material



Techmer invests to expand 3D printing materials capacity

IACMI project with Purdue, Techmer, Thermwood creates AM materials database



Allegiant Stadium installs world’s largest 3D printed sculpture

Dassault Systemes co-locates at Purdue’s CMSC

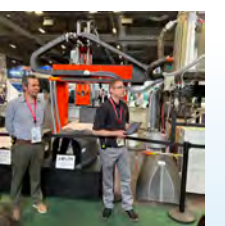


Purdue opens LSAM lab & forms CAMS consortium



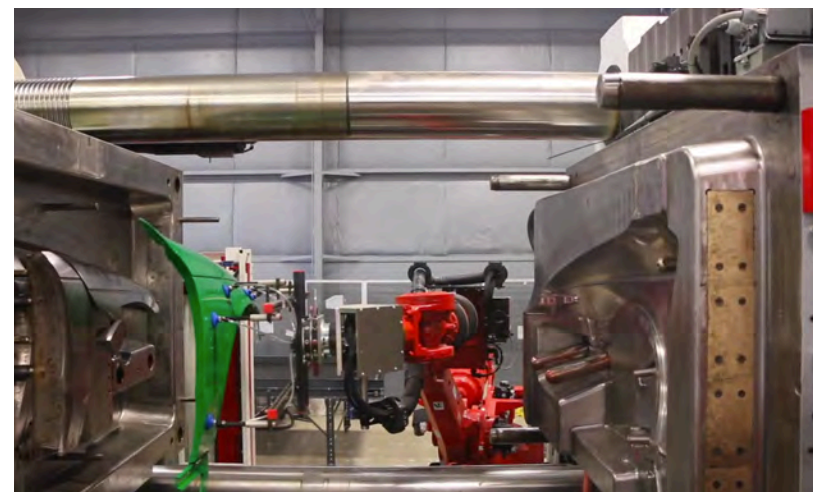
Purdue begins licensing ADDITIVE3D software

Thermwood and Purdue demonstrate LSAM at JEC World





# Technical Innovation



Technical innovation has been central to IACMI's mission from the beginning, including investments in diverse, scalable composites manufacturing facilities across eight states. Our current focus is leveraging these resources to drive advancements in wind energy, aerospace, automotive, and infrastructure projects.

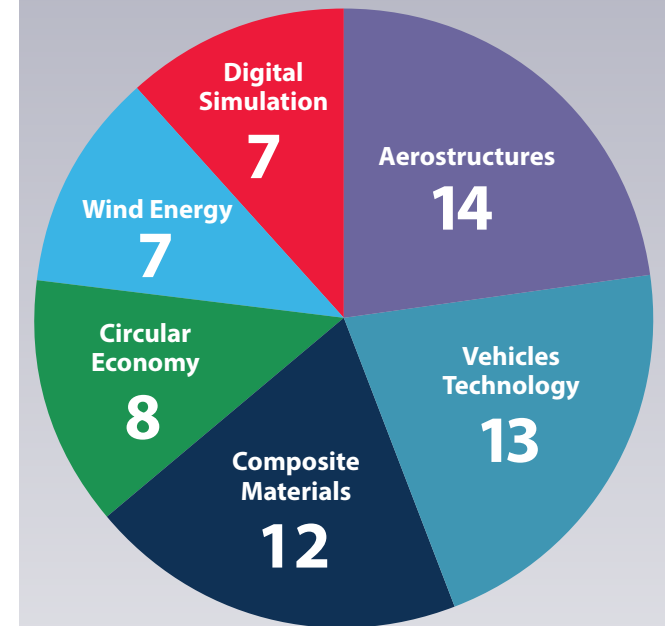
	Goal	1.0 Projects Achieved	2.0 Projects Projected
\$	Reduce production costs of composites	25%	50%
	Demonstrate recyclability or reusability	80%	95%
	Lower Embodied Energy	50%	75%

IACMI also:

**Increased Technology Readiness Levels** in additive, vehicles, wind turbines and composites recycling

**Improved composites manufacturing** via process simulation and quality control

IACMI 1.0 projects



**"IACMI's SuRF facility gave us access to equipment and tooling we would never have been able to afford on our own."**

—Andrew Maxey, Vartega



TECHNICAL INNOVATION

2016

2018

2019

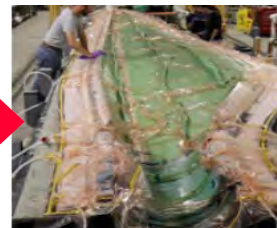
2022

## Success Story: Manufacturing of Recyclable Thermoplastic Wind Turbine Blades

NREL demonstrates technology at 9-meter length (TRL 5)



NREL fabricates 13-meter thermoplastic blade (TRL 6)



NREL completes validation testing of 13-meter blade (TRL 7)



LM WIND POWER

LM Wind Power scales thermoplastic blade technology to 62 meters (TRL 8)

ARKEMA



**60+** Collaborative and industry-led technical projects

**90+** IACMI members participating on technical projects

**25** new products and technologies commercially available

**\$150M** in research and development value





# Workforce Development

IACMI's WD programs build a robust talent pipeline from "K to gray" for U.S. advanced manufacturing. Through STEM events, workshops, online courses, and hands-on training, IACMI inspires and educates students about advanced careers in composites (ACCP), CNC machining (ACE), and casting & forging (METAL). We're preparing and connecting next generation machinists and engineers to further education, internships, apprenticeships, and rewarding careers.

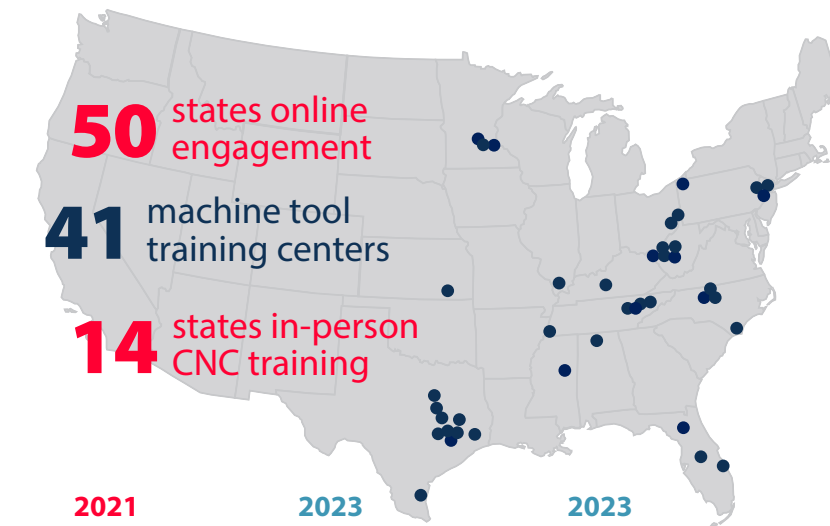
[AmericasCuttingEdge.org](https://AmericasCuttingEdge.org)

[MetalforAmerica.org](https://MetalforAmerica.org)

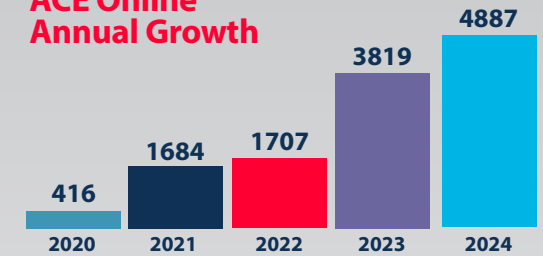
**"I sought to get everything I could out of my internships, and I feel I'm a strong example of those efforts paying off."**

—Will Henken, Volkswagen  
VOLKSWAGEN GROUP OF AMERICA

## IACMI- America's Cutting Edge Training Facilities

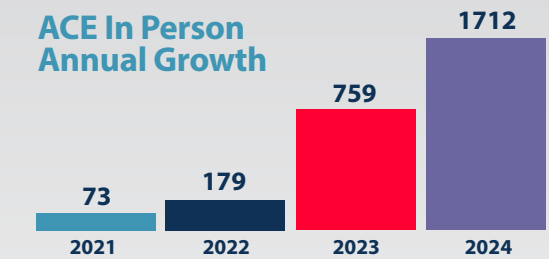


### ACE Online Annual Growth



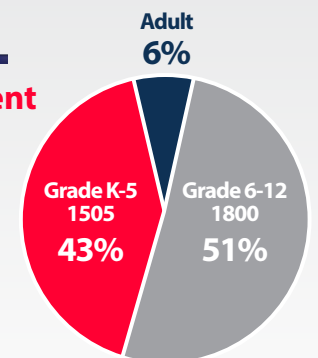
12,000+ trained in 50 states in CNC, metrology, composites or cybersecurity.

### ACE In Person Annual Growth



Yearly ACE in-person participation has increased 856% between 2022 and 2024.

### METAL Engagement



## Success Story: K-Gray Training in Advanced Manufacturing

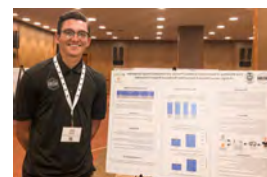


2016  
Internship program 1.0 begins

2017  
Composites One workshops begin



2019  
\$5M MEEP award for ACCP



2020  
UT Professor Tony Schmitz launches IACMI-ACE online training

2021  
ACE testbed at UTK for hands-on CNC training



2023  
SkillCrafters 1400+ for grades 6-12



InnoCrate pilot, 2000+ K-12  
1000+ trained in composites through ACCP

2024  
METAL launches bootcamps, workshops, outreach, & apprenticeships

2024  
CAMX InnoCrate wins CAMX ACE award

2025  
Internship program 2.0 begins



5100+ Hands-on advanced manufacturing training

18,300+ Students engaged in STEM Outreach

12,400 Online training in all 50 states

100 Internships with industry collaboration





ACMI has helped members leverage resources in two ways. The first is empowering them with access to equipment, facilities, and expertise they would not otherwise have. The second is through enabling companies and universities to secure additional funding, building on innovations and resources facilitated by IACMI. Early investments from the Department of Energy paved the way for the Department of Defense to establish critical, scalable training programs in CNC machining, casting, forging, and of course, composites.

*“IACMI is a vital asset for any company looking to grow their business needs in composites.”*

— Dale Leftwich, JR Automation



### Catalyzing Additional Funding

IACMI Member Recipients	Source of Funding	Amount (\$M)
Workforce Development (ACCP + ACE + METAL)	DoD	69
R&D \$ for universities (Purdue + UTK + UDRI)	NSF, CERN, DOE, DoD	53
R&D \$ for federal labs (ORNL + NREL)	DOE	36
Investment in new manufacturing facilities	TPI	25
Investments in startups and SMEs	Innovation Crossroads, Diamond Edge Ventures	17
R&D \$ for industry (Ford + GM + SuRF)	DOE	15
<b>Total</b>		<b>\$215M</b>

2015

IACMI launches project with Ford & Dow

2016-2019

Ford & Dow qualify and use Vorafuse CF composites in Ford vehicles

2017

IACMI/INEOS project develops carbon fiber/vinyl ester prepregs

2017-2019

IACMI, VW and IDI develop lightweight SMC liftgate

2018

Michelman launches Hydrosize Carbon product line for sizings

2020

Volkswagen Innovation Hub Knoxville co-locates at UTK's Innovation North

2020

IDI Composites commercializes Alluralite & Fortium SMC materials

2020-2022

Volkswagen Innovation Hub supports improving paintability of SMC parts for Bentley and Lamborghini

2021

Hyundai uses IDI's Fortium™ in Santa Cruz truck bed

2025

Volkswagen Commercial Vehicles releases ID Buzz EV with composite liftgate for US Market





# An Ecosystem of Innovation

lacmi.org

AIRBUS



NORTHROP GRUMMAN



ARKEMA

SOLVAY



LM WIND POWER

SCHULER



WABASH



trimer



ExxonMobil

U.S. Department of ENERGY



COMPOSITES ONE



ZOLTEK



THERMWOOD



plasmatreat



AGILE ULTRASONICS



MICHELMAN



HLA ENGINEERS, INC.



ROCTOOL

'TORAY' Toray Performance Materials Corporation

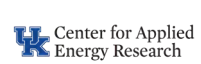


TEIJIN TEIJIN AUTOMOTIVE TECHNOLOGIES

TEIJIN TEIJIN CARBON AMERICA, INC.



RAMACO



VOLKSWAGEN GROUP OF AMERICA



JAMES CROPPER



One of 18 Manufacturing USA institutes, the Institute for Advanced Composites Manufacturing Innovation (IACMI) is headquartered in Knoxville, TN and is managed by the Collaborative Composite Solutions Corporation (CCS). CCS is a not-for-profit organization established by the University of Tennessee Research Foundation.