

Join us for the Summer 2019 Members Meeting in Denver



# IACMI – The Composites Institute®

## Institute Outcomes in Colorado

April 2019



The Summer 2019 Members Meeting will be held in Denver, Colorado showcasing IACMI's partners in the state including national laboratories, leaders in advanced manufacturing and technology, and top tier universities. The conference will highlight technical advancements of the institute, member successes, workforce development activities, and more. Join us this July 23 – 25, 2019, to network with IACMI members, discuss the 50+ IACMI project advancements, and tour innovation spaces including NREL's National Wind Technology Center.

**Visit [iacmi.org/summer-2019-members-meeting](http://iacmi.org/summer-2019-members-meeting) to register and learn more.**

### Schedule Overview

#### TUES., JULY 23

- Project meetings
- Intern workshop
- Board of directors meeting
- Tour of the National Wind Technology Center
- Tour and ribbon cutting at Vartega

#### WED., JULY 24

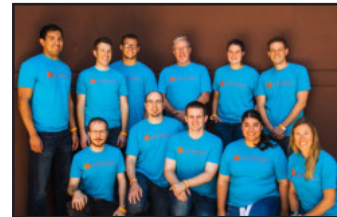
- Full-day conference sessions
- Project meetings
- Networking reception



Tour the National Wind Technology Center

#### THURS., JULY 25

- Morning, half-day conference
- roadmapping workshop
- Project meetings



Join the Vartega team at the ribbon cutting

The 2016 Members Meeting in Denver welcomed more than 300 attendees representing more than 100 companies. Former governor John Hickenlooper welcomed attendees, and presentations were provided by Siemens Gamesa Renewable Energy, Colorado Office of Economic Development and International Trade, and many others.



### Strengthening wind energy growth in U.S. energy market

Colorado is home to IACMI – The Composite Institute's wind technology area. The National Renewable Energy Laboratory (NREL), Colorado School of Mines, Colorado State University, and the Colorado Office of Economic Development and International Trade (OEDIT) lead IACMI's Colorado activities with a focus on wind turbine technology. Capitalizing on the long and productive history of collaboration between NREL and the major wind industry OEM's, including GE, Siemens Gamesa, Vestas, TPI Composites and LM Windpower, IACMI's Wind Turbine Technology Area is developing, testing, and deploying transformational manufacturing methods, designs, and materials that will result in increased opportunities for wind power utilization in the US energy market and for catalyzing economic growth in Colorado.

According to the U.S. Department of Energy, wind energy has the potential to support more than 600,000 jobs in manufacturing, installation, and maintenance; and it will have a capacity for 404.25 gigawatts of energy produced across 48 states by 2050. Companies in Colorado are part of this growing ecosystem and are demonstrating long-term impact to the state through their workforce training, technology innovations, capital investments, and job creation.



IACMI Members in Colorado

### About IACMI

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.



### IACMI – The Composites Institute

[www.iacmi.org](http://www.iacmi.org)  
2360 Cherahala Blvd.  
Knoxville, TN 27932

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

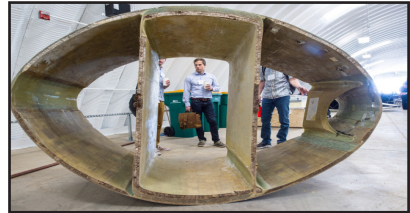


The Institute for Advanced Composites Manufacturing Innovation (IACMI), managed by the Collaborative Composite Solutions Corporation (CCS). CCS is a not-for-profit organization established by the University of Tennessee Research Foundation. As a Manufacturing USA institute, IACMI is supported the U.S. 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 creates an **ecosystem of innovation** to drive

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

**Creating an Innovation Network**



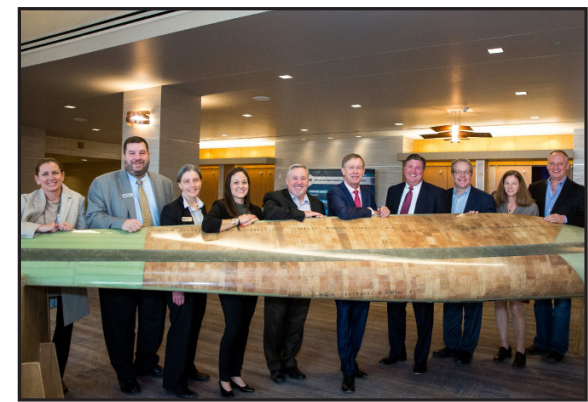
**Thermoplastic Composite Development for Wind Turbine Blades**

IACMI is investigating new developments in thermoplastic materials to lower production costs, improve recyclability of wind turbine blades, and expand applicability to components demonstrated at large scale. The long-term impact could reduce costs and improve reliability in composite structures, which allow for process improvements on a larger scale, increasing energy efficiency.

**Partners:** led by TPI Composites in collaboration with NREL, Johns Manville, Colorado School of Mines, Arkema, Purdue University, University of Tennessee, and Vanderbilt University



Coverage of the 9M wind blade has been picked up by national media and trade media including North American Wind Power, Materials Today, KnoxNews, Plastics.com, JEC Composites, Lucintel, Yahoo, ChooseColorado and more.



As a next step in the project, the technology is being scaled-up to a 13M wind blade – which is an industry standard size for utilization.

**Establishing an Environment for Innovation**



**The Composites Manufacturing Education and Technology Facility (CoMET)**

The CoMET, at NREL's National Wind Technology Center (NWTC) paves the way for innovative wind turbine components and accelerated manufacturing. The CoMET, located near Boulder, CO, is home to IACMI's Wind Technology Area.

**Innovations through Colorado-based research**



**Recycled carbon fiber for automotive applications**

Through the use of innovative and novel enabling technologies the Vartega-led project team will characterize and validate materials to meet the growing demand for cost effective carbon fiber needed for vehicle weight reductions to improve fuel economy, reduce emissions, and extend electric vehicle range.



**Project partners:** Michelman; Oak Ridge

National Laboratory; Colorado School of Mines; Michigan State University; University of Dayton Research Institute; and University of Tennessee, Knoxville; with support from BASF and Ford.

**Wind energy IACMI members**



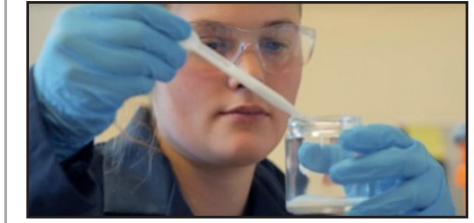
**Serving Workforce Needs**

**6** Colorado Internship placements  
**500** Composites training workshop participants in Colorado, in partnership with Composites One



**Internship program training next generation of engineers**

The internship program began in the summer of 2016 with 15 participants and 8 sites and has now graduated over 100 interns from the program. Colorado interns have been hosted at NREL's CoMET facility and at Vartega working on projects to increase the recyclability of wind turbine blades.



"IACMI and Vartega opened so many doors for me, allowing me to become a project leader, attend industry events, offer client-facing solutions, and present my work." – Kylie Van Aken, 2018 IACMI Intern at Vartega; present Vartega mechanical engineer

**Impacting Economic Development**

IACMI catalyzes small and medium sized companies to succeed through workforce training, ecosystem collaboration, and R&D resources. A few of the SMEs that have participated in IACMI events include Vartega, Steelhead, Allegheny Science and Technology, and Ability Composites.



**Hundreds Trained in Colorado Workforce Initiatives**

Nearly 500 technicians, business owners, students, and professionals representing over 200 companies have been trained during IACMI's hands on workshops held annually at the CoMET facility, with a total estimated short term economic impact of nearly \$600,000 to the state of Colorado.

**National composites industry impact:**  
**\$400M** Investment in eight states **3,000** Jobs announced