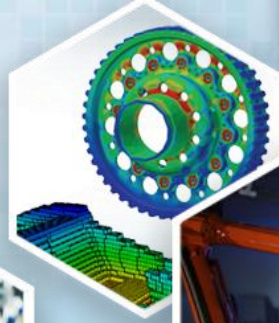
Future Mobility/Vehicle Technology Working Group - Overview

Ray Boeman, Michigan State Univ
Hendrik Mainka, VWGoA

Wednesday, October 6, 2021


THE COMPOSITES iacmi INSTITUTE

Convene. Connect. Catalyze.

FM / VT WG Steering Committee

Sid Asthana
Magna

Dan Coughlin
ACMA

Cliff Eberle
ORNL

Ginger Gardiner
CompositesWorld

Hendrik Mainka
Co-chair
Volkswagen

Ray Boeman
Co-chair
Michigan State University

Photo
N/A

Chris Griffen
GLCI

Eric Haiss
IDI Composites

Krishnan Iyer
ExxonMobil

William Henken
Volkswagen

Dale Brosius
Advisor
IACMI

Uday Vaidya
Advisor
IACMI

Brian Knouff
ORNL

Dana Lowell
Helicoid

Dana Miloaga
Johns Manville

Steve Nolet
TPI Composites

Working Group Participation

Working Group Meeting	Fall MM 2020	Winter MM 2021	May 2021 Mtgs	August 2021 Mtgs
Future Mobility/Vehicles Technology	130	96	83	50
High Rate Aerostructures Fabrication	97	102	82	52
Infrastructure and Construction	80	84	57	43
Recycling/Circular Economy	129	122	74	56
Simulation/Digital Twin	82	74	38	32
Wind Energy	84	88	69	41

Working Group	Opted - In
Future Mobility/Vehicles Technology	62
High Rate Aerostructures Fabrication	77
Infrastructure and Construction	56
Recycling/Circular Economy	60
Simulation/Digital Twin	47
Wind Energy	61

October 2020 – Inaugural WG Meeting

- Proposed Framework, Mission, Activities, Objectives
- Example High-level Megatrends
- Examples of Past and Current Innovations
- Overview of DOE Vehicle Technology Materials Roadmap
- Polls
  - Factors impacting growth
  - Opportunity and challenges from technology standpoint

Pre-Members Meeting Survey: February 16, 2021 -

Responses: 66

Motivation & Value Proposition

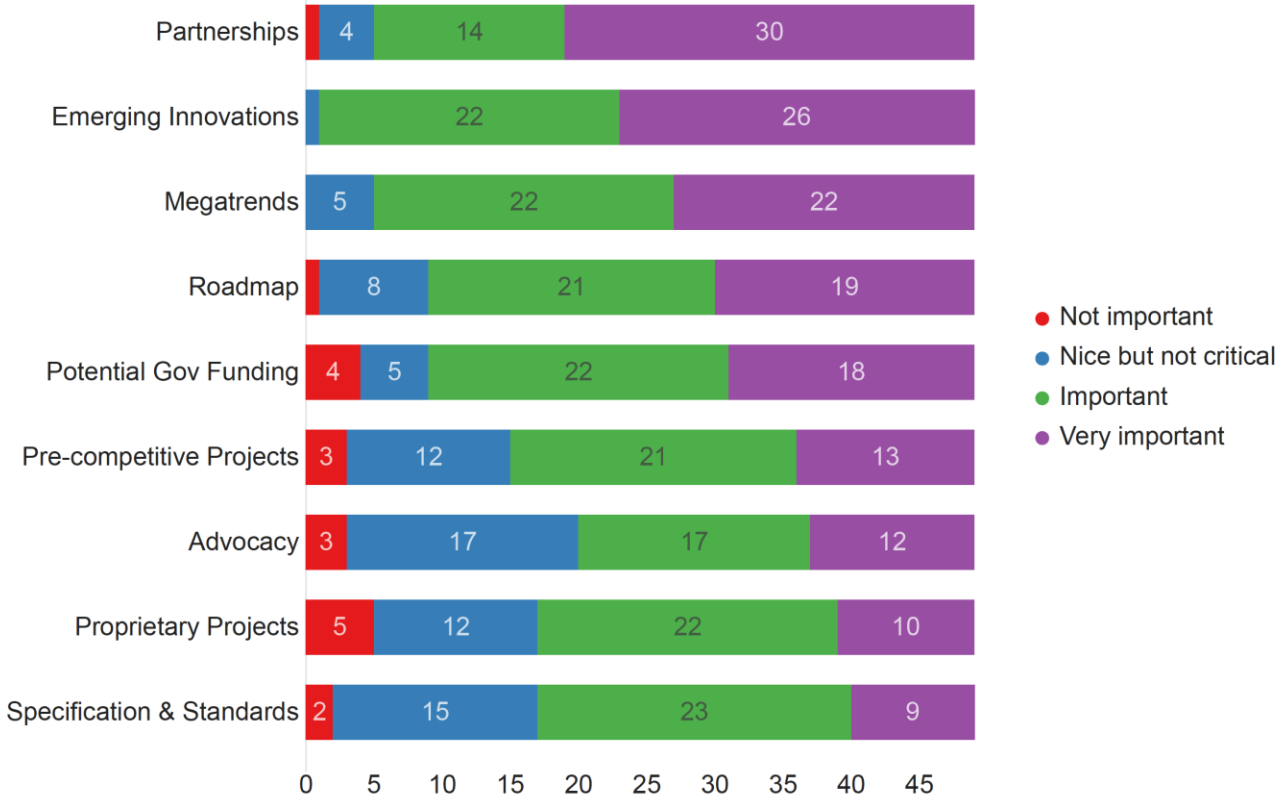
- Rate the importance of the following potential activities and goals of the WG
- Rate the importance of collaboration with other IACMI WGs
- Thoughts on how the WG can be structured and/or run to maximize benefit
- Participation in future WG (co-chair, steering committee, subgroup, etc.)

Demographics

- Organization size, core business, markets, domestic or global, etc.

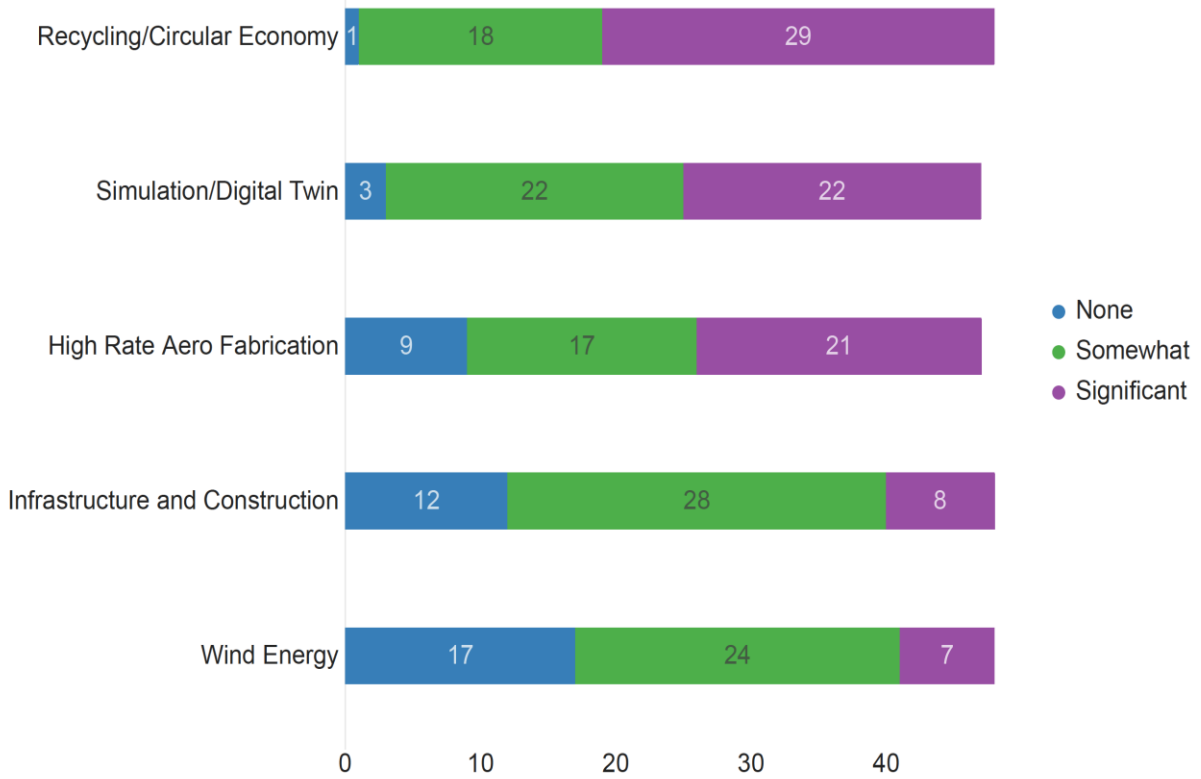
February 2021 pre-meeting survey – 66 responses

Rate importance of potential activities and goals



February 2021 pre-meeting survey – 66 responses

Importance of collaboration with other IACMI WGS



February 2021 –WG Meeting

- Recap of Inaugural Meeting, membership
- Survey results
- Trimming project: Brian Knouff, ORNL

MAI Carbon – IACMI Collaboration: Machining of Composites

AMERICAN PROJECT GOALS
Determination of cutting technologies regarding cutting speed and quality
- Waterjet cutting
- Abrasive waterjet cutting
- Wet machining
- Laser beam cutting

GERMAN PROJECT GOALS
Optimization of machining processes (machine tools/robots and processes)
- dry machining: chip and dust extraction technologies
- wet machining: tools and process

Creation and execution of a bench-mark test for 3D cutting technologies

COMMON PROJECT GOALS
Creation of a knowledge base for 3D composite material cutting technologies
- Fast choice of the best fitting technology
- Estimation of quality, costs, productivity, emission, etc.

MICHIGAN STATE UNIVERSITY

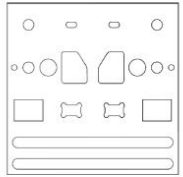
Institute for ADVANCED Composites Manufacturing INNOVATION

Shape Process Automation

Scale-up Research Facility (SuRF)

Now that you molded it… How do you trim it?

- 60K psi Waterjet
- 90K psi Waterjet
- 90K psi Abrasive waterjet
- Wet router
- 4kw Fiber laser
- 650w C02 Laser
- Ultrasonic knife



SPA and IACMI have a strategic agreement to cut composites for you!

May 2021 Working Group Meeting

Presentation: Manufacturing Extension Partnership
Mark Schmit, National Institute of Standards and Technology

Presentation: Novel Thermosetting Polymer Systems
Henry Sodano, Trimer Technologies, LLC

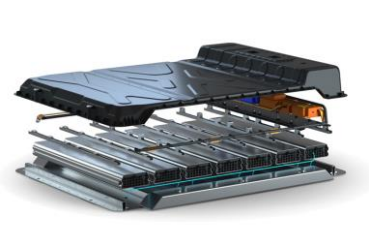
Presentation: Industrial Automation Solutions for Composites
Christon Manzella, Shape Process Automation

Update: Material Standards & Trimming Projects
Brian Knouff, Oak Ridge National Laboratory

August 2021 –WG Meeting
Sustainability from vehicle technology perspective*

*versus system perspective (e.g., mass transit, system efficiency, etc.)

Electrification

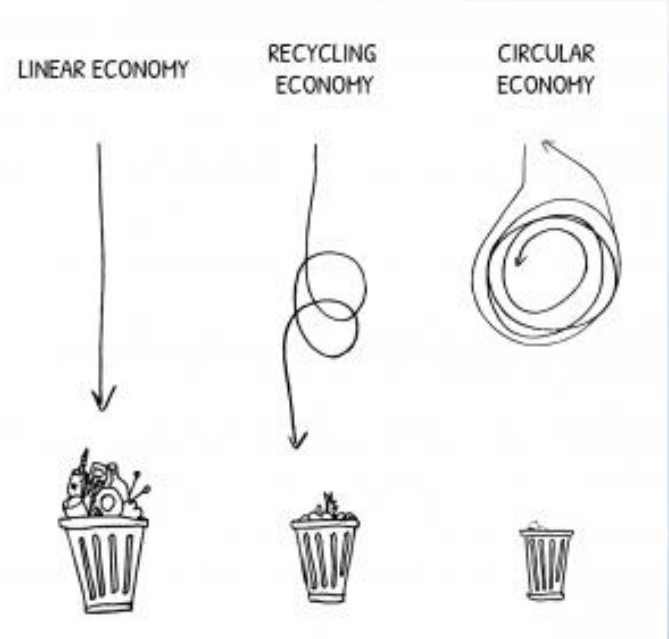


Source: www.compositesworld.com

Bio-based Materials

Source: cordis.europa.eu/

Circular Economy



https://zone.recycledevon.org/circular-economy-resource-box/

Future Mobility/Vehicle Technology Working Group Meeting
Panel Discussion – Composite Battery Enclosures – Oct 5, 2021

Venkat Aitharaju
Researcher/Principal Investigator DOE project,
General Motors

Andrew Halonen
President,
Mayflower Consulting

Sandy Munro
Founder & CEO,
Munro & Associates

Todd Altman
Sr. Director Strategic Markets,
TPI Composites

Christoph Kuhn
Project Manager/Technical Project Lead HV Battery, Engineering and Planning Center
(EPC), Volkswagen Group of America

Mike Siwajek
Vice President of R&D,
Teijin Automotive Technologies

Mohammadreza Eftekhari
HV Battery Mechanical Engineer,
Ford Motor Co.

Ben Mousseau
Sr. Supplier Industrialization Engineer,
Tesla

Photo Credit: Evonik

Attendees: >150 in-person and virtual

Near Term Next Steps

- Forensics on Yesterday's Meeting
- Establish sub-groups (soliciting input – survey?)
- Establish Steering Committee Liaisons to other WGs

Opting into the FM/VT Working Group

- If you would like to “opt in” to the I&C working group, please send an email to:
  - Kim Hoodin khooding@iacmi.org
  - William Henken William.Henken@vw.com