**IACMI Future Mobility/Vehicles Technology Working Group**

**Meeting Summary for Inaugural Meeting 10/8/20**

Facilitators: Ray Boeman, boemanrg@msu.edu,

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The inaugural meeting of the Future Mobility/Vehicles Technology Working Group was held on October 8th during the IACMI fall review. The meeting was held virtually using Microsoft Teams.

Approximately 260 individuals registered, and 130 attendees participated in the session. Thank you to all that participated!

The slide presentation from the meeting has been provided as an attachment to the e-mail with this summary. The link below will take you to a Microsoft Teams recording of the session. You can fast forward to the beginning of the meeting by scrolling to the 11:40 mark.

[Meeting Recording Link](https://www.dropbox.com/s/p6qagzg2lq4tr79/REMINDER_%20Future%20Mobility_Vehicles%20Technology%20Working%20Group%20meeting%20-%20IACMI%20Fall%202020%20Members%20Meeting.mp4?dl=0)

**Presentation**

Ray Boeman welcomed attendees and identified the topic of the working group.

Dale Brosius began the meeting with an overview of the vision for the working group teams that are being formed (slides 2-4).

Dale announced Ray Boeman as the interim chair of the working group.

Ray Boeman presented the slide deck on initial Scope, Activities, and Objectives of the working group as well as a brief historical perspective, and highlight of technology & market trends. He provided a glimpse into the US Department of Energy’s (US DOE) Vehicle Technology Office’s (VTO) composites vision and strategy.

**Invited Comments**

After the presentation, Ray Boeman invited Chad Schell of the US DOE Advanced Manufacturing Office (AMO) and Dan Coughlin of the American Composites Manufacturers Association (ACMA) to provide comments.

Chad Schell, US DOE, AMO

Chad explained that AMO’s historical support for IACMI was as the federal sponsor of $70M to establish the institute. AMO has also provided related support for the Carbon Fiber Technology Facility (CFTF) and Manufacturing Demonstration Facility (MDF) at Oak Ridge National Laboratory. More recently, AMO has partnered with the VTO and Hydrogen Fuel Cell Technology Office to co-fund fiber and composites projects under federal funding opportunities. Going forward, AMO anticipates it will continue to have a composites portfolio and will use IACMI roadmaps and working group activities, along with other sources, to inform AMO as it establishes its priorities.

Dan Coughlin, ACMA (dcoughlin@acmanet.org)

Dan informed the attendees about ACMA’s programs to take composites into the automotive OEMs including past technology days at Ford and GM. Because of the pandemic, ACMA is hosting a series a virtual engagements at VW with the first on November 18. ACMA member priorities include outreach to additional OEMs including FCA, Toyota, and Tesla. Through such engagements, ACMA strives to obtain insights to OEM needs and market pull. They are seeing some recurring themes such as electrification. Dan noted that platforms are evolving a historical speed. He opined that it is important that composites need to be transformed from a material “of last resort”. He identified resiliency and transparency in the supply chain, as well as helping OEMs get their arms around the supply chain as important needs. Other trends or opportunities identified were acceleration of automation, advanced fiber placement/tape layup, and increased interest in thermoplastics as well as thermosets. Finally, Dan referred attendees to ACMA’s website (<https://acmanet.org>) for more information on two upcoming conferences on supply chain issues in February, and Composites Industrial Revolution/Factory of the Future in May.

**Polls**

After the invited comments, four polls were taken to provide context for future activities of the working group.

The first poll identified the respondents’ perspectives on the top three factors impacting growth of polymer composites in Future Mobility/Vehicle Technology. The number one response, identified by almost 85% of the respondents was lightweighting for its own direct merit irrespective of added benefits such as an enabler for increased range of electrified vehicles, or multifunctionality. Completing the top three, were Circular Economy and Electrification at 53% and 50%, respectively.

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| Future Mobility/Vehicles Technology Survey - Growth impacts |
| **Most important factors impacting growth (Pick top three)** |  |
| Answer Choices | Responses |  |
| Lightweighting | 84.38% | 54 |  |
| Electrification | 50.00% | 32 |  |
| Integration of sensors, actuators | 32.81% | 21 |  |
| Multi-functionality | 37.50% | 24 |  |
| Design flexibility | 46.88% | 30 |  |
| Circular economy, sustainability, LCA | 53.13% | 34 |  |
|  | **Answered** | **64** |  |
|  | **Skipped** | **0** |  |

The second poll identified the respondents’ perspective on the top opportunities and challenges for polymer composites in Future Mobility/Vehicle Technology. The attendees were instructed that they could choose either opportunities, challenges, or a mixture. Approximately 60% of the 57 respondents identified development of new materials at the top followed almost 50% voting for hybridization and 40% voting for multi-material joining.

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| Future Mobility/Vehicles Technology Survey - Tech Opportunities and Challenges |
| **Technologies Opportunities and Challenges (Pick top three)** |  |  |
| Answer Choices | Responses |
| Development of new materials (improved cost, performance) | 59.65% | 34 |
| Reduction of offal (waste for manufacture of a part) | 12.28% | 7 |
| Reduction of scrap (percentage of good parts) | 21.05% | 12 |
| Automation | 33.33% | 19 |
| Process throughput (non-automation) | 33.33% | 19 |
| Hybridization (similar or dissimilar materials) | 49.12% | 28 |
| Multifunctionality/integration (e.g. sensors, actuators, etc.) | 17.54% | 10 |
| Multi-material joining | 40.35% | 23 |
| Education and workforce development | 12.28% | 7 |
| R&D resources (e.g., financial, infrastructure) | 21.05% | 12 |
|  | **Answered** | **57** |
|  | **Skipped** | **0** |
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The third poll identified the stakeholder make-up of the attendees as reflected by the respondents. It was noted that the first stakeholder category was listed as automotive OEM but really was intended to include any OEM including heavy truck, aircraft, etc. Material Supplier at almost 45% was the dominate category more than doubling the second category – Research Institution – and quadrupling the third category – OEM. It was stated that perhaps an important first effort of the working group will be to evaluate the stakeholder make-up and recruit underrepresented stakeholders.

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| Future Mobility/Vehicles Technology Survey - Primary Stakeholder Role |
| **Primary stakeholder role (Pick one)** |  |  |
| Answer Choices | Responses |
| Automotive OEM | 10.71% | 6 |
| Tier 1 | 5.36% | 3 |
| Tier 2 | 3.57% | 2 |
| Materials supplier | 44.64% | 25 |
| Engineering and services supplier (including M&S) | 8.93% | 5 |
| Research Institution (University, Government, Non-Profit) | 21.43% | 12 |
| Federal and State Agency | 0.00% | 0 |
| Trade & Professional Associates, Communication, Advocacy, etc. | 5.36% | 3 |
|  | **Answered** | **56** |
|  | **Skipped** | **0** |

The final poll asked about the desired frequency of meetings for the working group. Approximately 2/3 of the 37 respondents selected quarterly.

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| Future Mobility/Vehicles Technology - Meeting Frequency |  |
| **How often should this working group meet? (Select One.)** |  |
| Answer Choices | Responses |
| Quarterly (4x per year) | 64.86% | 24 |
| Bi-monthly (6x per year) | 32.43% | 12 |
| Monthly (12x per year, or 11x if December skipped) | 2.70% | 1 |
|  | **Answered** | **37** |
|  | **Skipped** | **0** |

Accordingly, the next meeting will likely be held soon after the first of the year, exact date TBD.

**Comments & Discussion**

Comments provided within the audio recording

Rick Neff commented that competition is steel which has a very strong marketing campaign and recommended that such a marketing strategy for composites be a consideration for the working group.

Larry Drzal commented that biobased polymers and fibers wasn’t explicitly identified but recommended they be included within the scope.

A question was posed regarding cost targets for CNTs and graphene which was beyond the scope of the discussion. Steve Rodgers of EmergenTek commented that this was a complex question and provided his contact information for follow-on discussion.

Jeff Sloane commented on a couple points made by Julia Attwood from Bloomberg during her presentation the previous day. Specifically, Jeff highlighted forecasts that electric vehicles (EVs) would be cheaper than internal combustion engines (ICEs) by 2025, and EVs are projected to outsell ICEs by 2037. He inquired whether anyone was aware of any supporting or refuting data. None was offered.

Additional written comments from the chat:

Casey Hoffman: Design "Flexibility" is both a PRO and CON.

Sana Elyas: We hear lightweighting often when talking about advanced composites but OEM's and Tier I's have a different opinion. Part manufacturers are asked to match performance and cost targets.

Michael Connolly: Part consolidation, integration of other components and design freedom should be the focus. Lightweighting is the cherry on top.

Amanda Simpson: OEM, but aerospace not automotive

Arnaud Dereims: Amanda that is right future of mobility is not only auto !

Rick Neff: Hmmm not a place [on the survey] for machinery suppliers....

Lawernce Drzal: ONE MATERIAL THAT HAS NOT APPEARED IN ANY OF THE DISCUSSIONS IS THE USE OF BIOBASED FIBERS AND POLYMERS.  tHEY CAN BE CONMPETITIVE WITH gf AND PETRO BASED COMPOSITES

Steve Rodgers: For information on graphene, contact me - Steve Rodgers, steven.r@emergentek.com

**Next Steps**

Please indicate whether you would like to become a member of this Working Group by “Opting-In” within the SurveyMonkey link below.

[SurveyMonkey Link](https://www.surveymonkey.com/r/YQKM5YR)

By Opting In, you also agree to receive occasional updates and emails about action items and work moving forward. Please provide your feedback as well within the survey as we look to improve our Working Group meetings.

**Questions/Comments**

If you have any questions / comments, please feel free to contact Ray Boeman at boemanrg@msu.edu, Dale Brosius at dbrosius@IACMI.org, or Uday Vaidya at UVaidya@IACMI.org