

Transportation Electronics Update 14 February 2021

Next Steps for Transportation Electronics Technologies

Our Industry Session, **Next Steps for Transportation Electronics Technologies**, is scheduled for Thursday June 10th, 8:30 to 10:10 am (4 speakers per presentation): (chairs: Ralph Taylor, Fred Weber)

Session Status as I know it today

1. **A summary and status report on R&D projects funded by the Batteries & Electrification program**
 - a. Speaker Steven Boyd
 - b. DOE Vehicles Technologies Office of the U.S. Department of Energy
 - c. A This presentation provides a summary and status report on R&D projects funded by the Batteries & Electrification (B&E) program at the Vehicles Technologies Office (VTO) of the U.S. Department of Energy (DOE). B&E research covers electric drive technologies, grid integration, and advanced batteries. The U.S. has had a significant long-term U.S. commitment to this R&D – the FY 2020 budget for which approached ~\$174M. Current research spans a number of topics including high power density electric traction drive systems, medium voltage direct connected DC fast chargers, and advanced batteries. This presentation will discuss current research areas and programs along with recent key accomplishments for each area.
 - d. **Ralph to follow up**

2. **Presentation on Converters**
 - a. Speaker Charles Zhu
 - b. Delta
 - c. This session will explore an ongoing DOE-sponsored program to develop a high-efficiency, medium-voltage-input, solid state transformer (SST)-based 400-kW/1000-V/400-A EV extreme fast charger. The charger will boost charging power levels to charging speeds of 3-C, or above, and achieve a 180-mile charge within 10 minutes.
 - d. One presentation with two topics
Local energy storage systems and/or renewable energy integration will mitigate the system's grid impact. The SST will utilize MVAC at 4.8-kV or 13.2-kV to eliminate the line frequency transformer, increasing power density and reducing weight. Combined with SiC MOSFET device, the SST will increase grid-to-vehicle efficiency by 3.5% to industry-leading levels of up to 96.5%.
 - e. **Brij to follow up**

3. **Integrated gate drive for WBG devices 3**
 - a. Speaker Dr Mantooth
 - b. University of Arkansas
 - c. Need Abstract
 - d. **Tom to follow up**
 - e. Ozark Integrated Circuits

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4. Novel Dielectric and its Capabilities

- a. Speaker Kevin O'Conner
- b. CAPORUS
- c. Need Abstract
- d. Add one slide discussing - What is the DOE Lab-Embedded Entrepreneurship Program (LEAP)
- e. Check with Fred and Kevin – **Ralph to follow up**
- f. **Capacitor or Transportation Industry Session**

5. High voltage supercapacitor and capacitor dielectric materials company

- a. Speaker Don Derosa
- b. Need abstract.
- c. Is this part of the LEAP Program?
- d. **Tom to follow up**

6. TCPoly

- a. High thermal conductivity, additive manufacturing materials company
- b. Speaker Matt Smith accepted
- c. Need Abstract
- d. Add one slide discussing - What is the DOE Lab-Embedded Entrepreneurship Programs (LEAP)
- e. **Tom to follow up**

7. Evolution of packaging for EV's

- a. Commitment from Chavonne Due Feb 19th
- b. Commitment Final date Feb 26th
- c. **Chavonne to follow up**

8. SCIBREAK

- a. Speaker Dr Modeer - Resides in Europe
- b. Train application for charger – circuit breaker
- c. Need Abstract
- d. **Tom to follow up**

9. What is the DOE Lab-Embedded Entrepreneurship Programs (LEAP)

- a. Dan Miller Webinar Only
- b. EERE
- c. **Tom to follow up**

10. Three Presentations for APEC 2020 from Japan were not presented Last Year (9, 10, 11)

- a. Use one or more of them for Industry Session?

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- b. Possible Webinars
- c. Ralph to follow up

Potential Webinars

Dr. Eisuke Masada / Railway Technical Research Institute in Japan PE applications in Railway System Ground Facilities (Energy Management System for Urban Network, Energy-efficient Power Supply for High Speed Train, Super Speed Maglev System)
Confirmed

Dr. Tetsuo Uzuka / Railway Technical Research Institute in Japan Energy-efficient and alternative fuel Vehicle Drive Systems for Urban, Regional and High Speed Train
Confirmed

Dr. Shimizu / New generation Power Electronics and System Research Consortium On the sustainability of battery electric vehicles from a view point of the "Well to Wheel Model"
Confirmed

Possible workshop for 2022

<https://mae.osu.edu/people/atkinson.284>

Dr. Chris Atkinson is currently the Director of the Smart Mobility Initiative and professor of mechanical and aerospace engineering at Ohio State University. From 2014 to 2020 he served as Program Director at the Advanced Research Projects Agency-Energy (ARPA-E) of the US Department of Energy. At ARPA-E he initiated and managed external research and development projects in the advanced clean energy area totaling over \$120 million, including NEXTCAR, a program using connectivity and automation to improve vehicle energy efficiency.