

Transportation Electronics Meeting Minutes July and August 2021 Meeting Combined

Note **Bold** Items are from the August meeting

In Attendance

Fernando Salcedo (FELLOW)	fernando.salcedo@ee.doe.gov
Jim Spangler	jim.spangler@sbcglobal.net
Jems Lemke	Jens.Lemke@wartsila.com
Brij Singh	SinghBrijN@johndeere.com
Davide Giacomini	Davide.Giacomini@infineon.com
John Horzepa	john@psma.com
Arnold Alderman	
Chavonne Lee	
Fred Weber	
Joe Horzepa	
Dennis Stevens	

Next Meeting: 1 September @ 10:00 Central? Verify time

Summary of suggestions/possible topics from conference call for 2022 APEC

Suggestions from Brij (John Deere)

- Dynamic wireless charging: Effects on Infrastructure, Testing being done in Chicago (Aspire company name?)

- New switching devices

- Soft switching converters with 99% efficiency

- Norwegian Infrastructure presentation?

- Electric Machine systems

- Integration of power electronics with electric machine

- No slots, new materials, low inductance

- High switching rates

- Thermal improvements

- Smaller, Lighter, recycle as part of product design

Brij, also touched on the need for a better understanding of component reliability with the new up time requirements expected with EV car transportation systems.

Dinesh is looking into Wireless Charging Systems, in particular Norway infrastructure.

Ralph Taylor

- Gas Tax Replacement due to EVs

- Who is doing what?

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ORNL is also working of infrastructure.

Brij, and Chavonne, alternate electrification applications that could be discussed, like air conditioning.

Joe was really pushing the hydrogen power systems. The new details surrounding green hydrogen, vs. blue hydrogen is not well understood. **Patrick Leffluire** had mentioned being aware of considerable investments by Russia.

What Does It Take To Make A Vehicle Commercial. Discussions would include validation requirements down to the component level, Manufacturing IATF 16949, etc. Perhaps a reliability Engineer with an OEM, or an AEC member. **Need a Presenter**

Suggestions from Jems

- Electric multi-level design tool optimization
- Working with Fraunhofer
- For new designs
- New rectifier concepts
- Mosfets for replacing diodes
- Goal – Higher efficiency

Typhoon

- Simulations for Inverters and Chargers

Suggestions from Fernando (DOE)

- Integration of gate drives and power devices
- Higher power density
- 175°C – 200°C operation
- Electrification and extreme fast charging

Possible Themes:

Transportation Electronics: Cheaper, Lighter, Smaller, Longer (Increased Range)

IS Theme: **Vehicle Electrification Trends: Cheaper, Lighter, Faster (Fred)**

Arnold Alderrman

Standardization of the charging infrastructure, protocols, Tesla car with a tesla charger, charging

is free

Combine with other possible charging presentations

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Arnold suggestion - Battery Systems – Charging Time vs Life Time vs Battery Chemistry, Energy Management (Michael Hayes) (Eric Schneider)

Energy Storage Industry Session
Fuel Cells

Dennis Stephens
Status of fuel cell technology?
Nissan, Honda, Toyota, Hyundai, Intelligent Robots

Work being done on new battery technologies (target lifetime, longer)
Warranty

Freds Update July:

Committee members that were on the call:

Fred

Ralph

Brij

Fernando

Dinesh

Chivanne

Jon & Joe