



2026 Fourth International Conference on Sustainable Mobility Applications, Renewables and Technology (SMART)

October 18-21, 2026

EVs vs. HEVs - A Perpetual Automotive Competitiveness Evolution

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Acronym

E-PACE

Schedule

E-PACE is scheduled on Sunday, October 18, 2026, with a duration of three hours.

Structure

E-PACE is structure as follows

- 14H00 - 15H30 HEVs: from Unavoidability to Competitiveness with EVs
- 15H30 - 16H00 Coffee break
- 16H00 - 17H30 EVs vs. HEVs: Engineering the Next-Gen Powertrain

Outline

Over the past twenty years, the automotive landscape has undergone a profound transformation driven by emission regulations, advancing battery chemistries, and changing consumer demands. The E-PACE tutorial maps this paradigm shift by evaluating how internal combustion engines (ICE) integrated with electric architectures to form HEVs, and how those transitions eventually catalyzed the rise of pure EVs. A core focus of E-PACE is the critical evolution of powertrain topologies. Furthermore, the tutorial highlights the perpetual struggle for dominance between EV and HEV technologies. While full EVs offer zero local emissions and long-term sustainability benefits, HEVs continue to hold a competitive edge in regions with limited charging infrastructure. The analysis delves into how advancements in energy management systems (EMS), power electronics, and lightweight materials have improved the efficiency of both platforms. Ultimately, the E-PACE frames the EV vs. HEV dynamic not merely as a replacement, but as an ongoing technological symbiosis where innovations in HEVs frequently pave the way for next-generation EV breakthroughs.

Motivation

By focusing on powertrain evolution and addressing real-world limitations like infrastructure constraints, this topic offers high-value insights for a large audience starting from junior PhD students till industry professionals seeking to understand future sustainability trends. E-PACE aims to equip attendees with essential knowledge to navigate the evolving landscape of modern hybrid and electric powertrain technologies.

Expected Number of Participants

E-PACE expects to reach a targeted audience of 50 delegates.

Assumption of Knowledge

The target audience is assumed to possess a background in undergraduate-level electric engineering.

CV of Presenter

Professor Ahmed Masmoudi received the B.S. degree in Electrical Engineering from the National Engineering School of Sfax (ENIS), University of Sfax, Tunisia, in 1984, the Ph.D. degree from Pierre and Marie Curie University (Paris VI), France, in 1994, and the Habilitation à Diriger des Recherches (HDR) from ENIS in 2001.

He joined Schlumberger Ltd., France, as a Field Engineer in 1994. Since 1988, he has been with the Tunisian higher education system, where he has held various academic and research positions. He is currently a Full Professor of Electrical Power Engineering at ENIS, University of Sfax. He serves as Head of the Research Laboratory on Renewable Energies and Electric Vehicles and coordinates the Master's Program in Sustainable Mobility: Actuators, Research and Technology.

His research expertise encompasses (i) electrical machines: design, sizing, optimization, lumped circuit modeling and analysis, finite element modeling and analysis, bidirectional electromagnetic-thermal modelling finite element analysis, multiphase permanent magnet machines design with emphasis on the cooling system, electric machines control-oriented modelling and identification (ii) variable speed drives and generators: field oriented control, direct torque control, predictive field control, predictive torque control, energy efficiency improvement-oriented control strategies, performance recovery strategies synthesis and implementation under faulty scenarios, cost-effective variable speed drives, reduced-structure power electronic converters, (iii) targeted applications: wind energy harvesting systems, solar energy harvesting systems, wave energy harvesting systems, grid interfacing of renewable energies, electric propulsion systems, hybrid propulsion systems, automotive generating systems, range extenders, free piston engines, ropeless elevators, grid integration of electric vehicles (V2G and G2V) and fault-tolerant actuators for more electric aircrafts (MEA).

Professor Masmoudi has authored or co-authored more than 100 journal papers, including 33 articles published in IEEE Transactions, and over 200 international conference papers, 83 of which are indexed in the IEEE Xplore Digital Library. He has delivered 14 keynote lectures and received six Best Paper Awards. He is also the author or co-author of four books, guest editor of 14 special issues in leading scientific journals, including IEEE Transactions on Magnetics, and co-inventor of a U.S. patent.

He served as Chair of the Program and Publication Committees of the International Conference on Ecological Vehicles and Renewable Energies (EVER), Monaco, from 2007 to 2021. He is also the founder and Chair of the Technical Program and Publication Committees of the International Conference on Sustainable Mobility Applications, Renewables and Technology (SMART), first held in Kuwait in 2015.

His current research interests focus on the development of innovative AC machine topologies and advanced control strategies for electrical drives and generators, with applications to automotive, transportation, and renewable energy systems.

Equipment

In addition to a projector and screen, the E-PACE tutorial should be organized in an auditorium equipped with a whiteboard.