

## CO2 Reduction for Transportation Systems Conference

### Preliminary Program

Wednesday - June 12, 2024			
Registration			
Opening Welcome Address			
09.00-09.20	<ul style="list-style-type: none"> <li>SAE International Torino Section</li> <li>ANFIA</li> </ul>		
Plenary Opening Keynotes			
09.20-09.45	<ul style="list-style-type: none"> <li>Electro Mobility is the Future, but...! <b>M. Sens - IAV GmbH</b></li> </ul>		
09.45-10.10	<ul style="list-style-type: none"> <li>Sustainable Powertrains for People's Mobility <b>A. C. Kulzer - IFS, University of Stuttgart</b></li> </ul>		
10.10-10.20	<ul style="list-style-type: none"> <li>Q&amp;A Session</li> </ul>		
Break @Exhibition Area			
Parallel Sessions			
11.00-12.40	<b>Hydrogen for Sustainable Mobility: H2ICE&amp;H2FC</b>	<b>Hybridization &amp; Electrification</b>	<b>Aero &amp; Thermal Management</b>
Lunch @Exhibition Area			
Parallel Sessions			
14.00-15.40	<b>Hydrogen for Sustainable Mobility: H2ICE&amp;H2FC</b>	<b>Hybridization &amp; Electrification</b>	<b>Aero &amp; Rolling Resistance Reduction and Lightweighting Designs</b>
Break @Exhibition Area			
16.10-17.15	<b>New Powertrain Developments</b>	<b>Hybridization &amp; Electrification</b>	<b>Alternative Fuels and E-Fuels</b>
Plenary Keynote			
17.15-17.45	<ul style="list-style-type: none"> <li>Stellantis Dare Forward Plan, <b>D.Chiari - Stellantis</b></li> </ul>		
17.45	Final Remarks		
<b>Social Program</b> Congress networking Cocktail & Guided Tour of the Heritage Hub (transfer included – meeting point at 7.30 pm at Politecnico di Torino)			

**Thursday - June 13, 2024**

Registration

Plenary Keynotes

08.35-09.00	• Life Cycle Analysis: A Level Playing Field for Road Transport Environmental Regulations, <b>Z. Samaras - Aristotle University of Thessaloniki</b>
09.00-09.25	• Resources Challenges to Green Mobility and Related R&I, <b>C. Schernus - FEV Europe GmbH</b>
09.25-09.50	• Lifecycle Accounting for Transport Decarbonization - The Need, Barriers, And What Do We Do Next?, <b>A. Joshi, Clearflame Engines Inc.</b>
09.50-10.15	• Title and speaker TBD, <b>Robert Bosch GmbH Branch Italy</b>
10.15-10.30	• Q&A Session

Break @Exhibition Area

Parallel Sessions

11.00-12.40	<b>New Powertrain Developments</b>	<b>Alternative Fuels and E-Fuels</b>	<b>Hydrogen for Sustainable Mobility: H2ICE&amp;H2FC</b>
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Lunch @Exhibition Area

Parallel Sessions

14.00 – 15.20	<b>Hydrogen for Sustainable Mobility: H2ICE&amp;H2FC</b>	<b>From Well to Wheels to Life Cycle Assessment</b>	<b>Aero &amp; Thermal Management</b>
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Break @Exhibition Area

16.00-17.40	<b>Legislation Framework, Future Scenarios, and Infrastructure Development for Transport Decarbonization</b>	<b>Alternative Fuels and E-Fuels</b>	<b>Aftertreatment Systems</b>
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Plenary Keynote

17.40-18.00	• Title TBD, Senecal, K. - <b>Convergent Science</b>
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18.00 Closing Remarks

After the conference Technical visits (Politecnico Lab & Dumarey)

**Friday, June 14**

Morning - Technical visits (Dana Graziano or Denso Thermal Systems)



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## Parallel Session - Hydrogen for Sustainable Mobility: H2ICE&H2FC

- Fuel Cell Hybrid Electric Vehicles: the role of detailed modeling in optimal design during prototype development, **L. Bartolucci - Tor Vergata University of Rome**
- Direct Injection Hydrogen Combustion System for Mid-Duty Diesel Engines Retrofit, **D. Gessaroli - Dumarey**
- Exhaust After-Treatment Modeling Challenges for H2 Combustion Engines, **M. Zafeiridis - Gamma Technologies LLC**
- Assessment of the predictive capabilities of a combustion model for a direct-injection hydrogen-fuelled internal combustion engine for heavy-duty applications, **F. Pucillo - Politecnico di Torino**
- Development of a multi-zone 1D-CFD predictive combustion model for a diesel-H2 dual-fuel medium-speed engine, **G. Stanzione - Politecnico di Torino**
- Development of a Direct Injection Hydrogen Engine for off-road applications through numerical and experimental investigations, **F. Mallamo - FEV Italia**
- A Comprehensive Experimental Characterization of a DI Outward Opening Hydrogen Injector by Schlieren Imaging and Momentum Flux Distribution Maps, **L. Postriot - Università degli Studi di Perugia**
- Analysis and Visualization of Hydrogen Combustion in a Spark Ignition Optical Access Engine, **F. Ricci - Università degli Studi di Perugia**
- Experimental and Numerical Investigation of Abnormal Combustion Phenomena in a High-Performance Hydrogen Fueled DISI Engine operated in stoichiometric Conditions, **L. Rolando - Politecnico di Torino**
- Performance, Efficiency and NOx Emissions in A Sport Car H2 ICE, **F. Gullino - Ferrari Spa**
- Spectroscopy of Flame Kernel Inception During Ultra-Lean Operation of An Optically Accessible Spark Ignition Engine Fueled with Hydrogen, **S. S. Merola - CNR - STEMS**
- Model-Based Algorithm for Water Management Diagnosis and Control for PEMFC Systems for Motive Applications, **M. Sicilia - Università Degli Studi Di Salerno (Paper # 2024-37-0004)**
- The Potential of Hydrogen High Pressure Direct Injection Toward Future Emissions Compliance: Optimizing Engine-Out NOx and Thermal Efficiency, **R. Willems – TNO (Paper #2024-37-0005)**
- Advanced H2 ICE development aiming for full compatibility with classical engines while ensuring zero-impact tailpipe emissions, **T. Koerfer - FEV Group GmbH (Paper #2024-37-0006)**
- Assessing Heavy Duty Vehicle CO2 Emissions for Qualification as a Zero Emissions Vehicle, **D. K. Mumford - Westport Fuel Systems (Paper #2024-37-0007)**
- Guided Port Injection of Hydrogen as An Approach for Reducing Cylinder-To-Cylinder Deviations in Spark-Ignited H2 Engines – A Numerical Investigation, **P. E. Jung - RPTU University of Kaiserslautern-Landau (Paper #2024-37-0008)**
- 1D Modeling of a High-Performance Engine Fueled with H2 And Equipped with A Low NOx Aftertreatment Device, **G. Montenegro - Politecnico di Milano (Paper #2024-37-0009)**
- ANN-Based Modelling of Hydrogen Internal Combustion Engine for Model-in-the-Loop Applications and Development of a Dedicated Torque-Based Control Strategy, **P. P. Brancaloni - University of Bologna**
- A New Generation of Hydrogen-Fueled Hybrid Propulsion Systems for The Decarbonization of Urban Public Transport, **F. Millo - Politecnico di Torino**



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## Parallel Session - Hybridization & Electrification

- Numerical Assessment of Fuel Consumption and Tailpipe Emissions for Electrified Long Haul Heavy-Duty Commercial Vehicles, **A. Zanelli - POWERTECH Engineering Srl**
- Optimization of the Power Split Ratio for a Fuel Cells-Battery Hybrid Electric Supercar, **M. Diana - Università di Modena e Reggio Emilia**
- Hyva's Decarbonization Drive: Innovations in Component Electrification for Sustainable Heavy Machinery Solutions, **G.M. Fulgeri - Hyva Group**
- How far can you drive on a full charge? A practical exploration of Battery Electric Vehicles range and environmental impact based on real-world data, **A. Tansini - European Commission Joint Research**
- Potentials of non linear MPC strategy for the optimal control of a parallel P4 hybrid electric vehicle: towards improved fuel consumption and emissions over different driving missions, **L. Teodosio - University of Naples Federico II**
- A methodology to develop and validate a 75-kWh battery pack model with its cooling system under a real driving cycle, **R. Sok - Waseda University (Paper #2024-37-0012)**
- Fuel Cell Fault Simulation and Detection for On Board Diagnostics using Real-Time Digital Twins Harshad, **R. Pandit - Gamma Technologies LLC (Paper #2024-37-0014)**
- The influence of design operating conditions on engine coolant pump absorption in real driving scenarios, **M. Di Bartolomeo - Università degli Studi dell'Aquila (Paper #2024 -37-0015)**
- Definition of a rule-based energy management controller for the simulation of a plug-in hybrid vehicle using power and on-board measured data, **S. Doulgeris - Aristotle University of Thessaloniki (Paper #2024-37-0016)**
- Choosing the Best Lithium Battery Technology in the Hybridization of Ultralight Aircraft, **T. Donateo - University Of Salento (Paper #2024-37-0017)**
- Potential of Serial Hybrid Powertrain Concepts towards decarbonizing the Off-Highway Machinery, **J. Weber - DENSO AUTOMOTIVE Deutschland GmbH (Paper #2024-37-0018)**
- Development of a Soft-Actor Critic Reinforcement Learning Algorithm for the Energy Management of a Hybrid Electric Vehicle, **L. Rolando - Politecnico di Torino (Paper #2024-37-0011)**
- Development of composite battery housing components: cost reduction and performance improvements for large volume BEVs, **L. Mazzarella - Autoneum Management AG**



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## **Parallel Session - Aero & Thermal Management**

- Validation of Boiling Model via correlation with Coolant Deposits, **M. Bovo - Aurobay**
- Numerical Assessment of the Potential of CO<sub>2</sub> as a Refrigerant for Electrified Powertrain Thermal Management System., **L. Rolando - Politecnico di Torino**
- Evaluation of a Combined Cooling/HVAC System for Electric Heavy Quadricycles under Different Conditions, **D. Chiappini - Universita' degli Studi Niccolo' Cusano**
- PFAS-free Thermal Management System with R290, **C. Massano - DENSO Thermal Systems SpA**
- Development and Validation of a Thermal Model for Passenger Car Cabin Temperature and Mobile Air-Conditioning Cooling Loads, **G. Fontaras - European Commission Joint Research Centre**
- Comparison of Performance and Efficiency of different Refrigerants at high load Conditions and their Impact on CO<sub>2</sub>eq Emissions, **C. Macrì - Daikin Chemical Europe GmbH (Paper#2024-37-0029)**
- Optimization of a Sliding Rotary Vane Pump for Heavy Duty Internal Combustion Engine cooling, **F. Fatigati - University of l'Aquila (Paper#2024-37-0030)**
- R290 HP-Module for Electric Vehicles, **A. Pogorelov - Rheinmetall - Division Power Systems (Paper#2024-37-0031)**
- Design of a Decentralized Control Strategy for CACC Systems accounting for Uncertainties, **A. Seifoddini - Politecnico di Torino (Paper#2024-37-0010)**



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Parallel Session

## Aero & Rolling Resistance Reduction and Lightweighting Designs

- Improving aerodynamic efficiency of EV trailers using advanced CFD optimization methods, **P. Geremia** - **ENGYS SRL**
- The new Porsche Taycan: Advanced Aero Wheel Strategy, **F. Cogotti** - **Dr Ing. hcf Porsche AG**
- Aerodynamics' Influence on Performance in Human-Powered Vehicles for Sustainable Transportation, **A. Di Gesù** - **Politecnico di Torino (Paper#2024-37-0028)**
- Lightweight construction enabled by measurement of forces and moments at the wheels, **G. Mastinu** - **Politecnico di Milano**
- Towards the Design-driven Carbon Footprint reduction of Composite Aerospace and Automotive components: An overview, **E. Dalpadulo** - **Università di Modena e Reggio Emilia (Paper#2024-37-0032)**



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## **Parallel Session - New Powertrain Developments**

- CFD modeling of advanced combustion modes for free-piston linear generators, **T. Lucchini - Politecnico di Milano**
- The Key Factors of Innovative Diesel Combustion Systems for Achieving Future Emissions and High Efficiency, **G. Belgiorno - PUNCH Torino SpA**
- Experimental Assessment of Additive-Manufactured Ducted Fuel Injection Combustion System for Medium-Duty Diesel Engine Achieving Ultra-Low Emissions, **G. Belgiorno - PUNCH Torino SpA**
- Towards carbon-free ICEs: premixed ammonia ignited with an active pre-chamber and the recuperated split-cycle concept, **L. Sforza - Politecnico di Milano**
- Lubricating Oil Effects on the Performance of an Automotive Turbocharger Turbine in Pulsating Flow: An Experimental Investigation, **S. Marelli - Università degli Studi di Genova**
- Numerical investigation of the mixing and combustion process on passive prechamber systems for high-speed large bore gas engines, **M. Zanatta - Politecnico di Torino**
- Numerical assessment of a hydrogen HPDI combustion system, **G. Quattrone - Politecnico di Torino**
- The PHOENICE Project: an Innovative Lean-Burn High Efficiency Spark Ignition Engine Concept, **F. Millo - Politecnico di Torino**



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## Parallel Session - Alternative Fuels and E-Fuels

- Potentials to Reduce Emissions in Heavy-duty Diesel Engines by Using Alternative Fuels and Advanced Combustion Modes, **K. Cung - Southwest Research Institute**
- Effects of chemical and physical properties of drop-in fuels on combustion and emissions of heavy duty diesel engines, **Y. Hatano - Waseda University**
- Environmental Sustainability of low/free - carbon fuels for SI engines: methanol, methane and hydrogen, **F. Catapano - STEMS-CNR**
- NG Engines Technologies to Enable Road Transport Decarbonization, **S. Golini - FPT Industrial SpA**
- Comparison Of the Effects of Renewable Fuels on The Emissions of a Small Diesel Engine for Urban Mobility, **O. Chiavola - Rome TRE University (Paper#2024-37-0019)**
- A Numerical Study of the Laminar Flame Speed of Hydrogen/Ammonia Mixtures under Engine-like Conditions, **F. Bochicchio - Università degli Studi della Basilicata (Paper#2024-37-0020)**
- Exploring methanol and naphtha as alternative fuels for a hybrid-ICE battery-driven light-duty vehicle, **E. Iñiguez - Universitat Politècnica de Valencia (Paper#2024-37-0021)**
- Experimental Study of Lignin Fuels for CI Engines, **M. Terauchi - Technical University of Denmark (Paper#2024-37-0022)**
- Experimental Assessment of Drop-in Hydrotreated Vegetable Oil (HVO) in a Medium-Duty Diesel Engine for Low-emissions Marine Applications, **C. Cosseddu - DUMAREY Automotive Italia SpA (Paper#2024-37-0023)**
- Evaluation of an optimal engine configuration for a SI Engine Fueled with Ethanol for Stationary Applications, **D. Perrone - Università della Calabria (Paper#2024-37-0024)**
- Influence of Intake Charge Temperature and EGR Rate on the Combustion and Emission Characteristics of Ammonia/Diesel Dual-Fuel Engine, **M. H. Ferdowsi - University of Mashhad (Paper#2024-37-0025)**
- Development of a Hybrid-Electric Medium-HD Demonstrator Vehicle with a Pent-Roof SI Natural Gas Engine, **J. Wallace - Southwest Research Institute (Paper#2024-37-0026)**
- Sustainable Fuels for Long-Haul Truck Engines: a 1D-CFD Analysis , **A. Volza - Università di Modena e Reggio Emilia (Paper#2024-37-0027)**





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## **Parallel Session - From Well to Wheels to Life Cycle Assessment**

- Life cycle greenhouse gas emissions of a novel Hydrogen-powered Engine, **A. Accardo - Politecnico di Torino**
- A Methodological Approach to Circular Design Strategies Based on Life Cycle Assessment for a Velomobile Production, **A. Di Gesù - Politecnico di Torino**
- Life cycle assessment of different powertrain alternatives for a clean urban bus in adverse weather conditions, **B. Peiretti Paradisi - Politecnico di Torino**
- Rotation for a better tomorrow - SKF's journey towards decarbonization, **L. Sguotti - SKF Industrie Spa (Paper#2024-37-0033)**



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**Parallel Session - Legislation Framework, Future Scenarios,  
and Infrastructure Development for Transport Decarbonization**

- The role of Renewable and Alternative fuels in decarbonization of transport to 2030-2050, D. Chiaramonti - Politecnico di Torino
- The evolution of conventional vehicles' efficiency for meeting carbon neutrality ambition, **D. Komnos - European Commission Joint Research (Paper#2024-37-0034)**
- Vehicle-to-grid can help accelerate European energy system decarbonization at a lower cost, **Y. Hou - Guidehouse**
- Modelling charging infrastructure in V2G scenario, **E. Innocenti - Università degli Studi di Firenze (Paper#2024-37-0003)**



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## **Parallel Session - Aftertreatment Systems**

- Development of Innovative Burners for Advanced Management of Engine Aftertreatment Systems, **A. Bianco - Powertech Engineering Srl**
- Acceleration of Fast-SCR Reactions by Eliminating “The Ammonia Blocking Effect”, **D. Morita - Waseda University (Paper#2024-37-0001)**
- Effect of Dithering on post-catalyst exhaust gas composition and on short time regeneration of deactivated PdO/Al<sub>2</sub>O<sub>3</sub> catalysts under real engine conditions, **S. Tomin - KIT Karlsruhe Institute Of Technology (Paper#2024-37-0002)**
- Experimental and Simulation Study of Zero Flow Impact on Hybrid Vehicle Emissions, **V. Emmanouil - Gamma Technologies LLC (Paper#2024-37-0036)**