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ABSTRACT:

Hydrogen Mobility 2050: Future Perspectives for the Transport Sector in the Era of Electrification

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As the global transport sector moves toward a carbon-neutral future, hydrogen is gaining increasing attention as a promising energy carrier alongside rapidly advancing electrification technologies. But where will hydrogen truly make a difference? From passenger vehicles and heavy-duty trucks to railways, maritime transport, and aviation, this invited talk explores the evolving role of hydrogen in shaping the next generation of sustainable mobility. Particular emphasis will be placed on the opportunities and challenges of hydrogen fuel cells, hydrogen-powered propulsion systems, and hydrogen-derived fuels in transport applications where conventional electrification may face practical limitations.

Drawing on the latest research developments, emerging technologies, and recent advances in hydrogen mobility, the presentation will examine the technological progress, energy efficiency, economic feasibility, and infrastructure challenges influencing the future of hydrogen-powered transportation. Looking ahead to 2050, it will highlight where hydrogen and battery electrification may compete, where they can complement each other, and how their integration could contribute to the European Green Deal and global decarbonization goals. Ultimately, the talk seeks to address a central question: What role will hydrogen realistically play in the future of transport?