



European Fuel Cells and Hydrogen

PIERO LUNGI CONFERENCE

FINAL PROGRAM

September 15th-17th 2026
Capri / Italy

ORGANIZED BY



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Tuesday 15th September, 2026

09:00	09:10	Welcome Viviana Cigolotti, Jack Brouwer, <i>Chairs of EFCH2 2026</i>
09:10	09:20	The Italian Energy Framework and the role of Hydrogen Giulia Monteleone <i>Department of Energy Technologies and Renewable Energy Sources, ENEA</i>
SESSION I - HYDROGEN STRATEGIES AND RESEARCH PRIORITIES: EUROPEAN AND INTERNATIONAL PERSPECTIVES		
09:20	09:40	National hydrogen programs and incentives Stefania Crotta <i>General Director, Financial Programs and Incentives, Ministry of the Environment and Energy Security</i>
09:40	10:00	Driving Innovation in the EU Hydrogen Ecosystem: Priorities, Projects, and Pathways Mirela Atanaisu <i>Head of Unit Operations and Communications, Clean Hydrogen Partnership</i>
10:00	10:20	Strategic Research Priorities for Hydrogen in Europe Luigi Crema, <i>President of Hydrogen Europe Research</i>
10:20	10:40	Accelerating Clean Hydrogen Innovation through Mission Innovation: Global Strategies, Cooperation and Deployment Pathways Piero Venturi <i>Director of Clean Hydrogen Mission, Mission Innovation</i>
10:40	11:00	Japan’s Strategy for Hydrogen and Its Derivatives: Policy Leadership and International Cooperation in Building Robust Supply Chains Daishu Hara <i>Director, Hydrogen and Ammonia Department, NEDO</i>
11:00	11:30	COFFEE BREAK
SESSION II - INNOVATION PATHWAYS: FROM RESEARCH EXCELLENCE TO INDUSTRIAL IMPACT		
11:30	11:50	Critical Challenges and Opportunities in Building a Viable Hydrogen Market Jack Brouwer <i>Director, Clean Energy Institute, University of California Irvine</i>
11:50	12:10	Scaling PEM Electrolysis from Materials Innovation to Industrial Manufacturing Kathy Ayers <i>SVP Research & Development, Nel Hydrogen</i>
12:10	12:30	From Innovation to Market: Enabling the Hydrogen Economy Through Infrastructure Development Pere Margalef <i>Director of Snam Research and Technology Center, SNAM</i>
12:30	12:50	Research and Innovation Across the Hydrogen Value Chain: current status, main challenges and Future Perspectives Julie Mougin <i>Deputy Director for Hydrogen Technologies, CEA Liten</i>
12:50	13:30	Roundtable Q&A and Closing remarks “Key Messages and Way Forward”
13:30	14:30	LUNCH

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Tuesday 15th September, 2026

START STOP	Session 2a: ROOM TEATRO	Session 2b: ROOM CAPRI	Session 2c: ROOM DONNA LUCIA	Session 2d: ROOM ROTONDA	Session 2e: ROOM ROTONDA A
	Fuel Cell and Hydrogen for Maritime	PEM Fuel Cells: Experimental Activities	Hydrogen Refueling Stations	Hydrogen Economy: Regional and National Perspectives	Alternative Pathways for Hydrogen Production
	Session Chair Simona Di Micco	Session Chair Antonino Salvatore Aricò	Session Chair David Blehman	Session Chair Emilio Nieto	Session Chair Domenico Borello
17:00 17:20	78 Dynamic Simulation and Optimization of a PEMFC-Battery Fast Ferry on a Real Italian Route Giuliano Agati University of Rome Sapienza	163 Advanced In-situ Oxygen Transport Diagnostics for Large Format PEM Fuel Cells Oliver Curnick Coventry University	116 Safe, Fast and Efficient Hydrogen Refuelling for Heavy-Duty Vehicles via a Multiphysics and Data-Driven Approach Matteo Genovese University of Calabria	219 The French National Research Program on Low Carbon Hydrogen: Projects and Achievements Abdelilah Slaoui CNRS	22 Hydrogen production from recycled aluminum foils and waste: Reactivity and kinetic analysis in acid or alkaline solution Marcello Romagnoli University of Modena and Reggio Emilia
17:20 17:40	141 Ejector Scaling for Marine PEMFC: CFD Modelling and Semi-Empirical Bias Correction from 5 to 200 kW Christian Antetomaso CNR-STEMS	55 Iron-Induced Degradation and Cation Migration in PFSA Membranes: Spatially Resolved Insights from Segmented Cell Analysis Assma El Kaddouri University of Lorraine	29 Hydrogen Compressor Modeling Using Physics-Informed Surrogates Niklas Nickig The Hydrogen and Fuel Cell Center ZBT	227 Hydrogen in pathways towards a climate neutral, circular and competitive European process industry: the AMIGDALA scenario framework Vittoria Battaglia ENEA	90 Thermo-Assisted Non-Thermal Plasma Methane Cracking: Prototype Development and First Experimental Insights for CO ₂ -Free Hydrogen Production Orlando Corigliano ENEA
17:40 18:00	205 Estimating Hydrogen, Methanol, and Ammonia Demand for the Deployment of Green Corridors in the Maritime Sector. Aniello Cappiello University of Naples Parthenope	47 Influence of Methanol Reformer Aging on HT-PEMFC Performance under Dynamic Conditions Emilija Todorovski University of Ljubljana	173 Techno-economic assessment of on-site hydrogen refueling stations based on renewable electricity, biogas, and ammonia pathways Davide Lanni University of Cassino European University of Technology EUT+	178 Importing Decarbonisation: The Geopolitics of Italy's Hydrogen Hub Strategy in the Mediterranean Giuseppe Pellegrini Masini ENEA	231 Low-Temperature H ₂ Release from Ammonia: Bridging the Ni–Ru Gap in an Electrified Structured Membrane Reactor Vincenzo Palma Università di Salerno
18:00 18:20	117 H-PORT: An Integrated Simulation, Safety and Techno-Economic Framework for Hydrogen-Powered Smart Ports Francesco Piraino University of Calabria	53 Influence of nominal contact pressure on activation behavior and spatial current redistribution in a pre-doped HT-PEMFC Filip Todorovski University of Ljubljana	186 MetroHyVe3: Traceable Metrology for Reliable, Safe and Scalable Hydrogen Refuelling Infrastructure Vito Fernicola Istituto Nazionale di Ricerca Metrologica	207 Biogas-Fueled Renewable Peak Power and Renewable Hydrogen and Fuel Generation Using Reversible Solid Oxide Electrolysis Cells – potentials on local and national level in Finland Robert Weiss VTT Technical Research Centre of Finland Ltd	27 Seawater electrolysis with integrated brine valorisation: a contribution to the water-energy nexus Raphaël Defroyennes UC Louvain
18:20 18:40		56 An investigation on the performance of pretreated sPEEK based CCB and CCM MEA for PEMFC operation Guillaume Etienne University of Lorraine	217 Techno-economic optimization of an on-site solar-powered hydrogen refueling station Giovanni Di Ilio University of Naples Parthenope	121 Energy System Modelling for Hydrogen Integration in the Italian Power Grid: Benchmarking and 2050 Scenario Analysis Andrea Lanzini Politecnico di Torino	128 Integrated Thermochemical Cycles for Carbon-Negative Hydrogen Production Salvatore Francesco Cannone University of Turin
18:40 19:00		30 Operando x-ray-based analyses for PEM fuel cells and water electrolyzers: time-resolved insights about catalyst degradation at a single cell level Marco Bogar University of Trieste	215 Predictive operation of a hydrogen refuelling station with scheduled clients Pol Cardona Rubio Institut de Robòtica i Informàtica Industrial CSIC-UPC		

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Wednesday 16th September, 2026

START	STOP	Session 3a:		Session 3b:		Session 3c:	
		ROOM TEATRO		ROOM CAPRI		ROOM DONNA LUCIA	
		Fuel Cell and Hydrogen for Aviation		Intelligent Diagnostics for Hydrogen Systems			Metrology and Hydrogen Emissions
		Session Chair <i>Carla Menale</i>		Session Chair <i>Pierpaolo Polverino</i>			
9:00	9:20	32	Test campaign for the proof of funtionality of a PEM fuel cell system for regional aircraft applications Cornelie Bänsch <i>German Aerospace Center</i>	144	Physics-Based One-Dimensional Modelling of a PEM Water Electrolyzer to Quantify Performance Trade-offs of PFAS-Free Membranes Thomas Dankers <i>TNO</i>	Keynote Speech - GERG Presentation Robert Judd <i>GERG</i>	
9:20	9:40	60	Digital Twin-Oriented Modeling and Validation of a Fuel Cell Hybrid Electric Propulsion System for Hydrogen-Based Aviation Christian Simone <i>University of Salerno</i>	61	Real-Time Electrolysis Stack Temperature Prediction Using Neural Networks and OpenModelica Mohsen Gharib <i>Fraunhofer IKTS</i>	GERG Strategy towards H2 Matteo Robino <i>SNAM</i>	
9:40	10:00	93	Development and testing of a lightweight two-phase pumped cooling system for aviation fuel cells Henk Jan van Gerner <i>NLR-Royal Netherlands Aerospace Centre</i>	103	Data-Driven Degradation Forecasting for AEM Water Electrolysis Marco Veneriano <i>University of Genova</i>	188 Metrology for Hydrogen and Hydrogen–Natural Gas Mixtures in Gas Networks: Validated Testing Methodologies from the THOTH2 Project Pawel Kulaga <i>INIG</i>	
10:00	10:20	139	Impact of High-Energy Neutron Radiation on PEM Fuel Cells in Aviation Nadine Mohamed <i>TU Braunschweig</i>	191	Development of a Flexible Test Bench for Advanced Characterization and Diagnostics of PEM and AEM Electrolyser Stacks Simone Anelli <i>BluEnergy Revolution</i>	143 Flow measurement traceability for hydrogen in gas networks: an insight into H2FlowTrace project Alessandro Guzzini <i>UNIBO</i>	
10:20	10:40	36	Accelerating Solid Oxide Fuel Cell – Gas Turbine Simulations: A Surrogate Modeling Approach Pascal Köhler <i>Leibniz University Hannover</i>	39	In-situ contact pressure monitoring of PEMFC stack: A new approach Vasanth Parthasarathy <i>Hanze University</i>	220 Metrology to Support Ammonia Use in Emerging Energy Applications (MetNH3Energy): Validation of the Ammonia Calibration Method Miguel Ballesteros <i>GERG</i>	
10:40	11:00			129	Conditional Physics-Informed Neural Network Modelling of PEM Electrolyzer Voltage Dynamics Nouhaïla Elkasmi <i>Institut de Robòtica i Informàtica Industrial CSIC-UPC</i>	87 Closing the Hydrogen Emissions Knowledge Gap: the NHyRA Approach Vittoria Troisi <i>SNAM</i>	
11:00	11:30	Coffee Break with Poster Session					

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Wednesday 16th September, 2026

START STOP	Session 4a:		Session 4b:		Session 4c:	
	ROOM TEATRO		ROOM CAPRI		ROOM DONNA LUCIA	
	Hydrogen for Energy Transition: Integrated Assessment		Advanced Pathways for Renewable Fuels Production		 Hydrogen Emissions and Safety	
	Session Chair Giorgio Graditi		Session Chair Marta Gandiglio		Session Chair Miguel Ballesteros	
11:30 11:50	107	The role of hydrogen in the energy transition: effects of carbon budget and of the introduction of nuclear power plants Paolo Colbertaldo <i>Politecnico di Milano</i>	181	Advanced biorefinery platform for renewable H ₂ -based fuels production Emilio Nieto <i>Centro Nacional del Hidrógeno</i>	209	Advancing the assessment of climate and environmental impacts of a future Hydrogen Economy with the HYDRA project Rossella Ugrnani <i>TINEXTA INNOVATION HUB</i>
11:50 12:10	17	Price-driven optimal grid-connected hydrogen production Robert Dickinson <i>Adelaide University</i>	149	Analysis of SOEC-based systems for the production and import of e-NG Stefano Campanari <i>Politecnico di Milano</i>	195	Impacts of the Hydrogen Economy on Global Hydrogen and Air Pollutant Emissions: A Scenario Analysis Using the GAINS Model Peter Rafaj <i>IIASA</i>
12:10 12:30	148	Integration of green hydrogen production for transport decarbonization into the italian electricity grid: a numerical analysis Fulvio Paolo Buzzi <i>University of Tuscia</i>	106	Fuel properties and composition of green diesel produced via catalytic deoxygenation of rapeseed oil Sonia Dell'Aversano <i>University of L'Aquila</i>	111	Applying Hydrogen Safety Lessons to the 2026 Colton Accident David Blekhman <i>California State University</i>
12:30 12:50	75	Techno-Environmental Assessment of Industrial-Scale AEM Electrolysis: The Ansaldo Green Tech case Vera D'Oriano <i>Ansaldo Green Tech</i>	65	Enhancing e-Biomethanol Synthesis from Biomass-Derived Syngas via a LTA-Zeolite Catalytic Membrane System Nadia Cerone <i>ENEA</i>	224	Advance H ₂ Safety: Material Integrity to Network Resilience drawing on EU Projects: CANDHy, PilgrHYm and SHIMMER Ludovico Mazzocco <i>GERG</i>
12:50 13:10	92	Performance evaluation of a hybrid energy system of biomass based on solid oxide fuel cell Angeliki Brouzgou <i>University of Thessaly</i>	197	Green Methanol Production via SOEC Co-Electrolysis Coupled with Solar Energy: Process Design and Analysis Gianpaolo D'Andrea <i>University of Naples Parthenope</i>	224	Advance H ₂ Safety: Material Integrity to Network Resilience drawing on EU Projects: CANDHy, PilgrHYm and SHIMMER Miguel Ballesteros <i>GERG</i>
13:10 14:10	Lunch					

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Wednesday 16th September, 2026

START STOP	Session 5a:		Session 5b:		Session 5c:	
	ROOM TEATRO		ROOM CAPRI		ROOM DONNA LUCIA	
	PEM Fuel Cells: Modelling Activities		Alkaline Electrolysis: Experimental Activities		Hydrogen Systems: Economics and Integration	
	Session Chair <i>Vincenzo Mulone</i>		Session Chair <i>Matteo Genovese</i>		Session Chair <i>Giulia Monteleone</i>	
14:10 14:30	119	Deep learning model of PEMFC stack degradation under CO contamination Luca Praticò <i>Fondazione Bruno Kessler</i>	33	Characterisation of electrode bubble coverage by electrochemical impedance spectroscopy in an alkaline water electrolysis flow-cell Xavier Pinon <i>UC Louvain</i>	206	Preliminary Assessment of a Hydrogen-Powered Pushback Tractor for Ground Handling Decarbonization at Milan Malpensa Airport Simona Di Micco <i>University of Naples Parthenope</i>
14:30 14:50	23	Pinhole growth in PFSA and hydrocarbon membranes under relative humidity cycling Mina Bahraminasab <i>Chalmers University</i>	109	Efficient urea-assisted water electrolysis at 1.5 A/cm2 for 1100 hours over in-situ produced NiOOH species Angeliki Brouzgou <i>University of Thessaly</i>	214	Analysis of the pressure time profile in a liquid hydrogen tank used for ship propulsion Rodolfo Taccani <i>University of Trieste</i>
14:50 15:10	142	Europy: a modular PEMFC multiphysics framework in Python/JAX/PETSc Gilmar Nogueira Junior <i>CEA - LITEN</i>	146	Pressurized alkaline electrolyser: technical challenges towards a high-pressure design Alessandro Guzzini <i>University of Bologna</i>	21	Electrolyzer Model Detail in Energy System Optimization: Implications for Dispatch and Waste Heat Availability Simon Dübell <i>Reiner Lemoine Kolleg</i>
15:10 15:30	154	Computational Model-based Performance Assessment of PFAS-Free Membrane-Electrode Assemblies in PEM Fuel Cells Andreas Podias <i>TNO</i>	127	Enhancing alkaline water electrolysis with Co-Mo layered double hydroxides Nerea López García <i>Centro Nacional del Hidrógeno</i>	83	Integrated Autonomous Hydrogen Energy Systems for Resilience and Humanitarian Crisis Response: A Techno-Economic Assessment Emmanuel Stamatakis <i>National Center for Scientific research DEMOKRITOS</i>
15:30 15:50	41	CFD-Based Parametric Optimization of Sinusoidal Flow Fields for High-Temperature PEM Fuel Cells Emanuele D'Alessio <i>University of Rome Sapienza</i>	193	Moving Beyond the Limitations of Conventional Alkaline Water Electrolysers for Efficient and Flexible Hydrogen Production Fatemeh Razmjoei <i>German Aerospace Center</i>	155	Hydrogen Energy Storage for Long-Duration Energy Shifting in a Remote Off-Grid Microgrid Robert Flores <i>UC Irvine</i>
15:50 16:10	226	Simplified Bi-Regional Metal Foam Flow Fields for Enhanced PEM Fuel Cell Performance Hadi Genceli <i>Yıldız Teknik Üniversitesi</i>	211	Membrane-less Supercritical Water Electrolysis for High-Pressure Hydrogen Production: First Technical Results from the X-SEED Project Giovanna Massobrio <i>Snam</i>	190	Mapping Hydrogen Supply Opportunities for Aluminium Decarbonization: Development of a GIS-Based Decision Support Tool Simone Anelli <i>BluEnergy Revolution</i>
16:10 16:40	Coffee Break with Poster Session					

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Wednesday 16th September, 2026

START STOP	Session 6a:		Session 6b:		Session 6c:	
	ROOM TEATRO		ROOM CAPRI		ROOM DONNA LUCIA	
	High-Temperature Electrolysis I		PEM Fuel Cells: Materials to System Modelling		Hydrogen Valleys and Integrated Systems	
	Session Chair Silvia Lo Conte		Session Chair Mariagiovanna Minutillo		Session Chair Gabriele Loreti	
16:40 17:00	96	A Multi-rSOC System for Flexible Energy Management in Data Center Applications: Modeling and Configuration Analysis Luigi Margutti University of Perugia	182	Large-scale 3D HTPEM stack simulations: single-cell thermal extrapolation vs. full electrochemistry modelling Vincenzo Mulone University of Rome Tor Vergata	24	HyMantovalley – A Case Study from Italy Marcello Romagnoli University of Modena and Reggio Emilia
17:00 17:20	76	Effect of Air Contact Layer Thickness on Oxygen Transport and Current Density Distribution in Solid Oxide Cells Imdad Uddin Chowdhury FZJ	40	Performance and mass transfer evaluation of a single HT-PEM fuel cell with straight and wavy serpentine flow channels using CFD simulation Mahmoud M. Abdelkader University of Rome Sapienza	45	Dynamic modelling and performance mapping of an integrated hydrogen valley ecosystem: the HySPARK case Jaroslaw Milewski Warsaw University of Technology
17:20 17:40	202	Integration of Proton Conducting Ceramic Electrolysis for hydrogen production in targeted industrial applications Fabiana Romano University of Salerno	169	1D - 3D heat transfer model for air cooling of hydrogen proton exchange membrane fuel cell Pierpaolo Martini University of Modena and Reggio Emilia	105	A methodological framework for mapping hydrogen value chains: the case of Friuli Venezia Giulia and the North Adriatic Hydrogen Valley Marinella Favot Area Science Park
17:40 18:00	184	Role of reverse Water-Gas Shift Reaction for CO ₂ Utilization in Molten Carbonate Electrolysis Cells Simone Mataloni University of Rome Sapienza	94	Electrospun PBI Membranes for HT-PEM Fuel Cells: Phosphoric Acid Uptake, Interaction Mechanisms and Preliminary Single-Cell Assessment Emmanuel De Gregorio University of Naples Parthenope	183	Qualitative Risk Assessment of Hydrogen Transport and Hydrogen-Fuelled Mobility in Road Tunnel Emanuela Bruno Politecnico di Torino
18:20 20:00	FREE TIME					
20:00 23:00	SOCIAL DINNER @ DA PAOLINO					

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Thursday 17th September, 2026

START STOP	Session 7a:	Session 7b:	Session 7c:	Session 7d:
	ROOM TEATRO	ROOM CAPRI	ROOM DONNA LUCIA	ROOM ROTONDA
	High-Temperature Electrolysis II	Low-Temperature Electrolyser and Fuel Cell Manufacturing	Hydrogen Storage: Materials, Modelling and System Integration	Sustainability and Life Cycle Assesment in the Hydrogen Economy
	Session Chair Massimiliano Della Pietra	Session Chair Teo Martin	Session Chair Stefano Ubertini	Session Chair Paolo Colbertaldo
9:00 9:20	72 Design and Validation of Machine Learning-based Prognostic Algorithm for SOEC durability prediction Pierpaolo Polverino University of Salerno	98 Impact of Roll-to-Roll Production Technologies on the Cost of PEM Fuel Cell Membrane Electrode Assemblies Ulf Groos Fraunhofer ISE	157 Kinetic-based and FVM numerical tools for the simulation of Metal Hydride storage tanks coupled with Phase Change Materials Vesselin Krassimirov University of Rome Tor Vergata	203 Advancing Social Life Cycle Assessment for Hydrogen Energy Pathways in Italy's 2050 Transit Alessandro Agostini ENEA
9:20 9:40	70 EIS-Based Diagnostic Algorithm for State-of-Health Assessment and Degradation Monitoring of SOEC systems Valentino Frasci University of Salerno	126 Enhancing the Mechanical Durability of Anion Exchange Membranes via Electrospun PVDF Fibers Reinforcement for Water Electrolysis Davide Damiani University of Bologna	104 Experimental Investigation of a Lab-Scale Metal Hydride – Phase Change Material Hydrogen Storage System Marco Maggini University of Tuscia	180 Lessons learned from the PEFCR development process: the case of the Fuel Cells and Hydrogen PEFCR for hydrogen storage devices Claudio Carbone ENEA
9:40 10:00	34 Concept of a solid oxide electrolysis-molten carbonate fuel cell hybrid system to support a power-to-gas installation Jaroslaw Milewski Warsaw University of Technology	71 Galvanic Pulse-Plating of iridium-ruthenium-alloys as catalyst for PEM water electrolysis Johannes Näther Mittweida University of Applied Sciences	97 CFD Assessment of Absorption-Rate-Based Charging Interruption for Thermal Protection and Recovery of an AB2 Metal Hydride Tank Massimiliano Renzi University of Bozen-Bolzano	150 Social Life Cycle Assessment of green hydrogen technologies: a systematic review and commentary from a social science perspective Giuseppe Pellegrini Masini ENEA
10:00 10:20	201 Thermally Integrated Hydrogen and Electricity Co-generation in a Direct Ammonia-Fueled Solid Oxide Fuel Cell System Hyuntae Sohn Korea Advanced Institute of Science and Technology	136 Toward Sustainable Bio-Inspired Anisotropic Ion Exchange Membranes by Self-Assembly of Bio-Based Solid Polymer Electrolytes Laurent Billon IPREM	204 Evaluation of internal bed temperature in a metal hydride cartridge during hydrogen charging using an experimentally based lumped-parameter model Scipione d'Avino University of Naples Parthenope	79 The Best Uses of Green Electrolytic Hydrogen Robert Flores UC Irvine
10:20 10:40	62 Multi-Mode Electrochemical Transient Characterisation of SOC Short Stacks under Fuel-Flexible/Biogas Operating Conditions Sadhana Golani FZJ	151 Surface treatment of stainless steel porous transport layer for oxygen evolution reaction enhancement in an anion exchange membrane electrolyser Rachmat Adhi Wibowo AIT Austrian Institute of Technology	177 C-based materials for solid state hydrogen storage: a new perspective Chiara Milanese Pavia University & CSGI	160 From Scrap to Storage: Life Cycle and Circularity Assessment ofTiFe0.80X0.20 Alloys for Hydrogen Storage Francesca Garelli University of Turin
10:40 11:00	228 Innovative Manufacturing Processes for Low-Cost, High-Performance SOCs: From Laboratory Results to Industrial Deployment Fabrizio Gualandris Hydrospark Srl		156 Geopolymers modification and its hybrid materials for hydrogen storage Md Akram Hossain University of Oulu	
11:00 11:30	Coffee Break with Poster Session			

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Thursday 17th September, 2026

START STOP	Session 8a:	Session 8b:	Session 8c:	Session 8d:
	ROOM TEATRO	ROOM CAPRI	ROOM DONNA LUCIA	ROOM ROTONDA
	Low-Temperature Electrolysis: Modelling Activities	Hydrogen Integration in Multi-Energy Systems	Hydrogen for Industrial Processes	Bio-Based Hydrogen Production and Waste Valorization
	Session Chair Vesselin Krassimirov Krastev	Session Chair Carlo Carcasci	Session Chair Robert Dickinson	Session Chair Nadia Cerone
11:30 11:50	194 A Practical PI Controller Design Approach for DC-DC Power Electronic Converters for Electrolyzer Applications Silvia Di Girolamo CNR	216 H2SCORE: An Integrated Hydrogen-Based Architecture for Complex Local Multi-Energy Microgrids Marta Gandiglio Politecnico di Torino	131 Novel hydrogen-based technologies for green iron and steel making Alfonso Chinnici Adelaide University	164 Design and Validation of a Modular Microbial Fuel Cell Stack for Urine Valorization and Energy Harvesting Domenico Borello University of Rome Sapienza
11:50 12:10	196 Fault-Tolerant Operation of a Stacked Interleaved DC-DC Buck Converter for PEM Electrolyzers Giuseppe La Tona CNR	199 Hydrogen as a Cross-Sector Vector in Advanced Multi-Energy Networks: Use-Case Framework and NZMES Results for Tertiary Buildings Francesco Lorusso Politecnico di Bari	200 Hydrogen Demand Projections and Renewable Power System Sizing for Hard-to-Abate Sectors in the Italian Energy Transition Simona Di Micco University of Naples Parthenope	166 Green hydrogen-driven in-situ biomethanation for methane-enriched biogas production in hybrid PtG configurations Giuseppe Lembo ENEA
12:10 12:30	158 Towards high-pressure AEM single-cell design through coupled electro–thermo–mechanical modelling Martina Prastaro Politecnico di Torino	46 Hierarchical Predictive Control for Coordinated Operation of Smart Prosumers in an Energy Community Alessandro Polimeni University of Rome Tor Vergata	122 Optimal green hydrogen generation design for the decarbonization of the steel industry: an Italian case study Emanuela Marzi ENEA	132 From biowaste to renewable hydrogen: pilot-plant validation and scale-up challenges Eudald Tuxans Sorigué
12:30 12:50	208 Multiphysics Modeling and Optimization of a Membrane-less Supercritical Alkaline Electrolyzer Arash Nemati Technical University of Denmark	162 H2BIDEA: Experimental and Numerical Evaluation of Structural Integrity and Material Compatibility for 100% Hydrogen Distribution Networks Unai De Francisco Vargas Fundación Tecnalia R&I	120 Decarbonization of a hard-to-abate process in steel making: effects of measured hydrogen plant performances on the techno-economic feasibility study Beatrice Bulzacca University of Bologna	210 A Scale-Up Platform for Renewable Hydrogen Production Technologies Based on Waste-Derived Biogas and Biomethane Daniele Micale Snam
12:50 13:10	25 Electrochemists going with the flow: CFD-guided optimization of flow-engineered 3D electrodes and cells for alkaline water electrolysis Kevin Van Droogenbroek UC Louvain	20 Numerical Insights into Transient Hydrogen Tracking in Gas Distribution Networks Michele Francesconi University of Florence		84 Development of an intensified gasification process for H2-rich syngas production Donatella Barisano ENEA
13:10 13:30	101 Performance-degradation oriented multiphysics 0D/3D numerical framework for PEMWE’s digital twin applications Raffaele Iossa RSE	185 Traceable Humidity Measurements Supporting Hydrogen Quality Assurance and Safety Across the Hydrogen Supply Chain Rezvaneh Nobakht Istituto Nazionale di Ricerca Metrologica		167 Development of a BioH ₂ -Biorefinery Through the Integration of Dark Fermentation and Microbial Electrolysis Cells Antonella Marone ENEA

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POSTER SESSION

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POSTER SESSION

TOPIC 1 — HYDROGEN PRODUCTION

ID	Title	Presenter	Affiliation
42	Electrochemical characterization of Molten Carbonate Electrolysis Cells: a focus on fuel electrode kinetics and degradation	Silvia Lo Conte	University of Naples Parthenope
63	Biomass-assisted electrolysis using lignocellulosic feedstock to produce hydrogen	Francesco Zimbardi	ENEA
73	Development of Performance Factor Analysis Method for Steam Electrolysis by SOEC	Takumi Imabayashi	Central Research Institute of Electric Power Industry
113	Towards a Standardized Testing Framework for AEM Water Electrolyzers	Giulia Campolucci	University Campus Bio-Medico of Rome
124	Investigation of the Challenges in Dynamic Operation of Pressurized Alkaline Water Electrolysers	Kamal Ghotia	German Aerospace Center
147	InnAEM: Innovative Materials for Anion Exchange Membrane Water Electrolysis	Miryam Gulino	University of Rome Sapienza
170	Electrochemical analysis of long-term performance of Molten Carbonate Electrolysis Cells under simulated seawater feed	Silvia Lo Conte	University of Naples Parthenope
BTA	Frequency Stability of Power-to-X and X-to-Power Technologies: Lab-Scale Microgrid Experimental Assessment	Lorenzo Fucacci	University of Bologna
BTA	Optimization Of Anode Catalyst Ink For Proton Exchange Membrane Water Electrolysis (PEMWE) In Terms Of Stability And Performance	Tushal Bhanubhai Hirpara	Zentrum für Sonnenenergie und Wasserstoff Forschung

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TOPIC 2 — HYDROGEN STORAGE AND DISTRIBUTION

ID	Title	Presenter	Affiliation
138	Experimental System for Hydrogen Permeability Testing at High-Pressure	Andrea Dei Sommi	University of Salento
176	Development of Pt-based bimetallic catalyst promoted with Fe, Mn and Co for hydrogen storage and release in LOHC systems	Emilio Nieto	Centro Nacional del Hidrógeno
192	Effect of Thermally Grown Steel Oxides on Hydrogen Permeation	Brigida Alfano	ENEA

POSTER SESSION

TOPIC 3 — FUEL CELLS TECHNOLOGIES

ID	Title	Presenter	Affiliation
31	Polydopamine-assisted functionalisation of bacterial cellulose with lignosulfonate as a bio-based ion exchange membrane in fuel cells	Sara Zdovc	University of Maribor
37	Combined thermal management and heat recovery for PEMFC-battery hybrid propulsion systems	Carla Menale	ENEA
48	Direct Biomass Fuel Cells for Small-Scale Biomass Utilization	Makoto Kawase	Central Research Institute of Electric Power Industry
50	Mechanical Testing Investigation of Aqueous Capillary r-GO based Inks for 3D-Printed Electrodes	Angeliki Brouzgou	University of Thessaly
80	Comparing the efficiency of a hybrid ICE vehicle fuelled with hydrogen with a fuel cell vehicle, based on a simulation model	Fernando Ortenzi	ENEA
95	Semicrystalline Syndiotactic Polystyrene Membranes for Electrochemical Applications	Alessandra Laperuta	University of Naples Parthenope
99	Electrochemical and morphological analysis of Pt catalyst degradation under maritime-inspired AST for PEMFCs	Sara Tamburello	Delft University of Technology
115	Interface Engineering in sPPO-Based Hydrocarbon Catalyst-Coated Membranes for PEM Fuel Cells	Carlo De Luca	University of Naples Federico II
118	Nanostructured Pt Catalyst Layers for Low-Loading PEMFCs by Pulsed Laser Deposition and Inverse MAPLE	Emmanuel De Gregorio	University of Naples Parthenope
212	From natural gas to hydrogen: experimental performance characterization of a solid oxide fuel cell system installed in an airport environment	Marta Gandiglio	Politecnico di Torino
234	STAND UP: Fuel cell–battery power units for heavy-duty applications	Andrea Altomonte	University of Naples Parthenope
BTA	Optimization of Water Management in PEM Fuel Cells: Experimental HFR Analysis under Variable Humidity Conditions	Anna Vondram	TU Braunschweig; German Aerospace Center DLR
BTA	Engineering Advanced FeNC Catalysts for PEM Fuel Cells: From Pore Design to Device Performance	Giulia Gianola	Istituto Italiano di Tecnologia CSFT, Polito
233	Hot Gas Conditioning and SOFC systems coupled to steam/oxygen fluidized bed gasifier plant	Enrico Bocci	Marconi University

TOPIC 4 — HYDROGEN END-USE APPLICATIONS

ID	Title	Presenter	Affiliation
86	Nutrient management in biological methanation reactors: experimental optimization of nutrient formulations and CSTR-TBR comparison	Gabriele Soggia	RSE
225	Real-Time Optimization of a Hydrogen Based Multi Energy System Using Machine Learning	Fatemeh Sadeghi	University of Tuscia

TOPIC 5 — HYDROGEN ECONOMY AND SUSTAINABILITY

ID	Titolo	Presentatore	Affiliazione
52	Environmental performance assessment of catalysts for water electrolysis in the context of the X-SEED project	Martí Aliaguilla	Leitat Technological Center
134	Techno-economic modelling of a hydrogen valley in Italy: a multi-scenario analysis of the Levelised Cost of Hydrogen	Andrés Yáñez	CIRCE Technology Centre
232	HySPARK: A Cross-Regional Hydrogen Valley for Airport and Urban Mobility Decarbonization	Alessia Piccolo	University of Naples Parthenope
133	Mechanical Recovery of Platinum-Based Cathode-Catalysts: A Circular Economy Approach for Sustainable-and Cost-Effective PEM Technologies	Nerea López Garcia	National Hydrogen Center, Puertollano, Spain
BTA	Advanced Methods for the Quantitative Assessment of the Safety of Decarbonization Technologies	Federica Tamburini	ETH Zurich, RRE Lab; University of Bologna, LISES

TOPIC 6 — HYDROGEN POLICY, MARKET, AND BUSINESS MODELS

ID	Title	Presenter	Affiliation
64	Standardization Safety and Analytical Protocols for Biomass Hydrogen: the project START-H2	Nadia Cerone	ENEA

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TOPIC 7 — HYDROGEN INNOVATION AND FUTURE TRENDS

ID	Title	Presenter	Affiliation
74	Redox properties of Azo Dyes determined via quantum chemical methods	Eleonora Hubenova	IEES BAS - Plovdiv University
77	Anodic biofilm formation under short-circuited conditions of SMFC	Yolina Hubenova	IEES BAS - Plovdiv University
152	H2-SimNet: A Simulation-Based Framework for Data-Driven Monitoring of Hydrogen Networks	Saverio De Vito Elena Esposito	ENEA
159	Electrochemical characterisation of Electrospun Nitrogen-Doped PVDF Hybrid Nanofibers for Bifunctional Metal-Free Electrocatalysts	Claudio Mele	University of Salento
171	Hydrogen-related pathways in NEST++: reversible conversion, biomass-to-syngas routes, storage monitoring and intelligent control	Francesca Santoni	ENEA
172	Characterization and Calibration Protocols for Gas Sensors in Hydrogen Systems: Towards Integrated Environmental Monitoring	Ettore Massera	ENEA
235	Smart and Sustainable PortsArtificial intelligence for cargo logistics and hydrogen terminal tractors	Andrea Altomonte	University of Naples Parthenope

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The European Gas Research Group (GERG)

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Through collaboration between industry, research organisations and other stakeholders, we facilitate the exchange of specialist knowledge, expertise and information, providing our members and partners with access to a strong research network and a valuable resource for innovation. Our work encompasses key areas of the energy transition, including hydrogen, renewable and low-carbon gases, gas infrastructure, methane emissions and technologies supporting decarbonisation.

By connecting expertise across the sector, we help identify common challenges, develop innovative solutions and advance technologies that can contribute to a sustainable, low-carbon, competitive and secure energy future.

We are committed to fostering research and partnerships that support the transition towards net-zero emissions, while strengthening collaboration between industry and the research community and contributing to long-term climate objectives.

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Pure Energy Hydrogen (PEH)

is a leading company specializing in the design, manufacturing, and turnkey delivery of hydrogen systems for small-, medium-, and large-scale applications. Our core business is the development of fully integrated hydrogen solutions, including water electrolyzers, oil-free hydrogen compressors, storage systems, and refueling infrastructure operating at both 350 and 700 bar.

Our product portfolio ranges from compact 0.5 kW electrolyzers to multi-megawatt hydrogen production plants, complemented by high-pressure gas storage systems, oil-free compressors capable of operating up to 1,000 bar, hydrogen dispensers, and complete refueling stations for hydrogen-powered vehicles, including passenger cars, buses, trucks, and trains.

PEH serves customers worldwide across a broad range of industries, including renewable energy, sustainable mobility, metallurgy, glass manufacturing, heavy industry, food processing, and the oil & gas sector. By combining advanced engineering with customized system integration, we help our clients accelerate the transition toward a low-carbon hydrogen economy.

Headquartered in Augusta, Sicily (Italy), Pure Energy Hydrogen brings together an international team with more than 25 years of experience in the development and deployment of hydrogen projects worldwide. Our Italian manufacturing facility specializes in the production of hydrogen system, including electrolyzers, compressors, dispensers, and integrated solutions for hydrogen generation, storage, and utilization, delivering reliable, high-performance technologies tailored to the evolving needs of the global hydrogen market.

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