

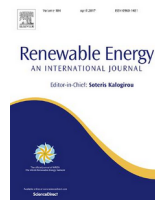
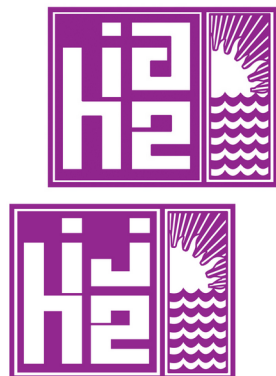


Hydrogen Power Theoretical & Engineering Solutions International Symposium 8-10 November, 2021 – On-line Conference

**Time zone
UTC+1**

Program at a glance

Monday, November 8 th		Tuesday, November 9 th				Wednesday, November 10 th	
Time	Room A	Time	Room A	Room B	Time	Room A	
09:00 09:10	Opening Session	08:30 09:10	Invited Lecture #3		08:30 09:10	Invited Lecture #4	
09:10 09:50	Invited Lecture #1	09:10 10:10	Poster Session 2		09:10 09:15	Break	
09:50 09:55	Break	10:10 11:40	Safety & regulation / Combustion		09:15 10:45	H ₂ from thermal processes	
09:55 11:25	Electrolysis	11:40 11:45	Break		10:45 11:00	Break	
11:25 11:30	Break	11:45 13:05	H ₂ from RES	High Temperature FC	11:00 12:20	High Temperature FC	
11:30 12:30	Low Temperature FC	13:05 14:05	Break		12:20 12:30	WOCST - Presentation	
12:30 12:40	HYPOTHESIS XVII – Pres.	14:05 15:25	H ₂ Separation	Power to X	12:30 13:30	Break	
12:40 13:40	Break	15:25 15:30	Break		13:30 14:30	Power to X	
13:40 15:40	Hydrogen Economy & LCA	15:30 16:50	Metal Hydrides	Low Temperature FC	14:30 14:35	Break	
15:40 16:40	Poster Session 1				14:35 16:15	H ₂ from thermal processes	
16:40 17:20	Invited Lecture #2				16:15 16:20	Break	
					16:20 17:00	Invited Lecture #5	
					17:00 17:15	Closing	





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Program

Monday November 8th

Opening Session & Invited Lecture #1

Chaired by Giuseppe Spazzafumo

9:00-9:10 Welcome address from the Conference Chair

9:10-9:50 David Hart - The chaotic transition – hydrogen energy market development

9:50-9:55

Break

Electrolysis

Chaired by Jakub Kupecki

9:55-10:25 I. Gatto, C. Lo Vecchio, S. Zignani, S. Trocino, G. Monforte, A. Patti, V. Baglio - Evaluation of an Anion-Exchange-Membrane Electrolyser Based on FUMASEP® FAA3-50 Membrane

10:25-10:45 C.V.M. Inocêncio, K.F. Bouho, T.W. Napporn, C. Morais and K.B. Kokoh - Earth-abundant electrocatalysts for water electrolysis: application in alkaline media

10:45-11:05 J. Kupecki, S. Jagielski, M. Kosiorek, A. Niemczyk and R. Kluczowski - Improvement of the performance of solid oxide electrolyzers (SOE) by fine tuning of the microstructure of electrodes – concept validation

11:05-11:30

Break

Low Temperature Fuel Cells - 1

Chaired by *Guglielmo Liberati*

11:30-11:50	Xingzi Yu, <u>Caizhi Zhang</u> , and Mengxiao Li - Experimental investigation of self-regulating capability of open-cathode PEMFC under different fan working conditions
11:50-12:10	Fátima C. Teixeira, António P. S. Teixeira and <u>Carmen M. Rangel</u> - New proton conductive membranes of indazole- and condensed pyrazolebisphosphonic acid-Nafion membranes for PEMFC
12:10-12:30	<u>C.H. Lin</u> , H.H. Chen, S.Y. Chen, and C.J. Tseng - Control of self-organization in drop-casted Nafion thin film to raise the maximum power density of PEMFC with nanostructured ultrathin-film catalyst
12:30-12:40	C.-J. Tseng - Presentation of HYPOTHESIS XVII
12:40-13:40	Break
<h2>Hydrogen Economy & Life Cycle Assessment</h2>	
<p>Chaired by <i>Chiara Dell'Armi</i></p>	
13:40-14:00	<u>T. Moustapha</u> , E. Carrera, C. Azzaro-Pantel, C. Cristofari - An optimisation approach for the design and planning of the hydrogen supply chain in insular territories
14:00-14:20	<u>D. Pivetta</u> , C. Dall'Armi, and R. Taccani - Ports as hydrogen hubs: an uncertainty analysis for the design and operation optimization
14:20-14:40	<u>B. Gerard</u> , E. Carrera, O. Bernard, and M. Chevenement - Techno-economic analysis of green hydrogen production using a Monte Carlo simulation approach
14:40-15:00	<u>G. Squadrito</u> , G. Maggio, A. Nicita - Damping green hydrogen costs by oxygen valorisation, a financial evaluation.
15:00-15:20	<u>G. Puig-Samper</u> , E. Bargiacchi, D. Iribarren, and J. Dufour - Prospective life cycle assessment of hydrogen production in a solid oxide electrolyser integrated into a parabolic trough concentrated solar power plant
15:20-15:40	<u>Stefan Petters</u> , Calvin Tse and Klaus Mauthner - Is Hydrogen the Magic Bullet?

Poster Session 1

15:40-16:40	<u>N. Esercizio</u> , M. Lanzilli, G. Nuzzo, C. Gallo, E. Manzo, A. Fontana and Giuliana d'Ippolito - Genetic manipulation of the Hyperthermophilic bacterium <i>Thermotoga neapolitana</i>
	<u>R. Zagrodnik</u> , K. Seifert, and A. Duber - Continuous dark fermentative H ₂ production from synthetic lignocellulose hydrolysate under different process conditions
	<u>A. R. Labanca</u> , A. G. Cunha, R. P. Ribeiro, C. G. Zucolotto, M. B. Cevolani and M. A. Schettino Jr. - Technological solution for distributing vehicular hydrogen using dry plasma reforming of natural gas and biogas
	<u>V. Troisi</u> , V. Piazza, A. Mostafa, Roberto Batista, A. Stagni, A. Frassoldati, G. Groppi and A. Beretta - Development of a small-scale biofuel processor: modelling of autothermal ethanol reforming
	Roger Avendaño, Maria Laura Dieuzeide, Roberto Tejeda and <u>N. Amadeo</u> - Sorption-enhanced steam reforming of ethanol for hydrogen production.
	J.M. Martinez Gonzalez, M.L. Dieuzeide, <u>N. Amadeo</u> , J.A. Francesconi - Single-step Sorption Enhanced Ethanol Steam Reforming: Modeling and Validation
Invited Lecture #2 <i>Chaired by Andrea Baccioli</i>	
16:40-17:20	Bryan Pivovar - The Growing Importance of H ₂ in our Evolving Energy System

Tuesday November 9th

Invited Lecture #3

Chaired by Fausto Gallucci

8:30-9:10 Annalisa Forte and Ippolito Furguele - Baker Hughes technology roadmap to 100%H₂ Gas Turbines

Poster Session 2

9:10-10:10	B. Buccheri, F. Ganci, P. Patella, G. Aiello, P. Mandin and <u>R. Inguanta</u> - Ni-Fe alloy nanostructured electrodes for water splitting in alkaline electrolyser
	<u>Chen Zhang</u> , Xu Guo, Shuzhi Zhang, Nian Peng, and Xiongwen Zhang - Components sizing optimization and sensibility analysis for the electric-thermal-hydrogen coupling integrated energy system
	I. Kovalev, <u>M. Popov</u> , S. Chizhik and A. Nemudry - Effect of oxygen nonstoichiometry on oxygen exchange process in cathode materials
	<u>A.S. Pushkarev</u> , I.V. Pushkareva, M.A. Solovyev, M.V. Kozlova, D.A. Simkin, and S.A. Grigoriev - Investigation of porous transport layers for polymer electrolyte membrane water electrolyzers
	I.V. Pushkareva, M.A. Solovyev, M.V. Kozlova, D. Bessarabov and A.S. Pushkarev - Electrode fabrication for efficient and low cost anion exchange membrane water electrolysis
	W. Y. Huang, K. R Lee, C. J. Tseng, <u>S. W. Lee</u> - Nd-doped LSCF nano-fibrous cathode for proton-conducting solid oxide fuel cells
	<u>Haibin Lu</u> , Xiaoteng Min, Xu Guo, Xiongwen Zhang, Guojun Li, Di Zhang - Research on the Mechanism of Alkali Metals Inhibiting Hydrogen Sulfide Poisoning
	<u>Haibin Lu</u> , Dan Chai, Shuzhi Zhang, Xiongwen Zhang, Guojun Li, Di Zhang - Study on the Mechanism of Alkaline Earth Metal Oxides in Inhibiting Surface Carbon
	<u>C. Molochas</u> , A. Brouzgou, F. Tzorbatzoglou, S. Kontou and P. Tsiakaras - Investigation of CO Poisoning in a PEMFC via Electrochemical Impedance Spectroscopy
	<u>Xiaoteng Min</u> , Dan Chai, Haibin Lu, Chen Zhang, Yiliang Xie, Xiongwen Zhang - Research on a portable planar PEMFC stack using printed circuit board technology
<u>Nian Peng</u> , Hongxia Zhang, Xiaoteng Min, Chen Zhang, Yiliang Xie, Xiongwen Zhang - Research on Thermal Management of Proton Exchange Membrane Fuel Cells	

Safety, Standards & Regulations / H₂ Thermal & Combustion processes

Chaired by Raffaella Gerboni

10:10-10:40	<p><u>Thomas Bacquart</u>, Marc De Huu, Janneke van Wijk, Karine Arrhenius, Indra te Ronde, Thor Anders Aarhaug, Jaana Viitakangas, Arul Murugan - Metrology for hydrogen vehicle: European projects achievements (MetroHyVe) and new objectives (MetroHyVe 2)</p>	
10:40-11:00	<p>K. Matsuura, N. Izawa, M. Inoue, and <u>T. Suga</u> - Continuous Sensing of a Leaked Hydrogen By a Quadrotor Drone</p>	
11:00-11:20	<p><u>R. Ortiz-Imedio</u>, A. Ortiz, J.C. Urroz, P.M. Diéguez, D. Gorri, L.M. Gandía and I. Ortiz - Performance and specific NO_x emissions of a spark ignition engine fueled with Coke Oven Gas</p>	
11:20-11:40	<p><u>J. Davies</u> and S.P. du Preez - The use of hydrogen as a chromite reductant</p>	
11:40-11:45	Break	
	Hydrogen Production from Renewable Energy Sources <i>Chaired by Gioele Di Marcoberardino</i>	High Temperature Fuel Cells - 1 <i>Chaired by Massimiliano Lo Faro</i>
11:45-12:05	<p><u>M. Lanzilli</u>, N. Esercizio, G. Nuzzo, C. Gallo, E. Manzo, A. Fontana and G. d'Ippolito - Bio-based production of hydrogen and CO₂ utilization</p>	<p>E. Pikalova, A. Kolchugin, A. Gilev, D. Medvedev, N. Pikalova, E. Guseva, S. Pikalov, A. Maignan, <u>E. Filonova</u> - Physico-chemical properties and electrochemical performance of La_{1.7}Ca_{0.3}Ni_{1-x}Cu_xO_{4+d} as cathodes for intermediate temperature solid oxide fuel cells</p>
12:05-12:25	<p>K. Potapenko, S. Cherepanova and <u>E. Kozlova</u> - Synthesis of copper-doped Cd_{1-x}Mn_xS Photocatalysts for Hydrogen Evolution under Visible Light Irradiation</p>	<p><u>I-Ming Hung</u>, Azam Khan, and Ju-Yu Hong - Characteristic and Electrochemical Performance of High Porous Ni/YSZ Anode support for Solid Oxide Fuel Cell</p>
12:25-12:45	<p><u>Laxmi Prasad Rao Pala</u> and Nageswara Rao Peela - An Optofluidic Planar Microreactor for Green Hydrogen Production via Photocatalytic Water Splitting</p>	<p><u>V. Sivcev</u>, I. Kovalev, M. Popov and A. Nemudry - Additive technologies for manufacturing of anode-support microtubular solid oxide fuel cells</p>
12:45-13:05	<p><u>G. Di Marcoberardino</u>, M. Giudici, A. Giostri and M. Binotti - Green hydrogen production via solar driven hybrid sulphur thermo-electrochemical cycle</p>	<p><u>J. Milewski</u>, L. Szablowski, R. Bernat, A. Szczesniak - Phyllosilicate minerals as sealants for Molten Carbonate Fuel Cell stacks</p>
13:05-14:05	Break	

	Hydrogen Separation <i>Chaired by Adolfo Iulianelli</i>	Power to X - 1 <i>Chaired by Christoph Hank</i>
14:05-14:25	V. N. Alimov, A.O. Busnyuk, E.U. Peredistov, A.I. Livshits, and <u>S. R. Kuzenov</u> - Substitutional V-Pd alloys: hydrogen solubility and global effect of alloying	R. Balzarotti, G. Drago Ferrante, M. Laganà, L. Pino, C. Italiano, <u>A. Vita</u> - Biogas Methanation and Oxy Steam Reforming over Rh-Ni/CeO ₂ catalyst washcoated over alumina open-cell foams for application in Re-SOC systems
14:25-14:45	<u>M. Manisco</u> , F. Russo, F. Galiano, A. Iulianelli, A. Figoli - Biopolymer membranes for CO ₂ separation: a second stage H ₂ generation process	<u>M. Lo Faro</u> , S. C. Zignani, and A. S. Aricò - Recent advancements on high temperature co-electrolysis of CO ₂ and H ₂ O
14:45-15:05	<u>Abdelrahman Mostafa</u> , Matteo C. Romano, Alessandra Beretta, Gianpiero Groppi - Dynamic Modelling of Sorption Enhanced Steam Reforming for Cost-Effective CO ₂ Capture	<u>C. Hank</u> , M. Holst, C. Kost, A. Schaadt, C. Hebling - The supply cost for globally traded energy carriers produced via Power-to-X
15:05-15:25	<u>A. Iulianelli</u> , C. Italiano, M. Manisco, A. Brunetti, A. Figoli, G. Drago Ferrante, L. Pino, A. Vita - CO _x -free H ₂ generation in a membrane reactor by steam reforming of a CH ₄ -CO ₂ mixture over a bimetallic catalyst	<u>Mahmoud Rammal</u> , Sasha Omanovic - The investigation of several experimental parameters on the electrocatalytic performance of nanostructured nickel-molybdenum oxide in the hydrogen evolution reaction
15:25-15:30	Break	

	Metal Hydrides <i>Chaired by Carmen M. Rangel</i>	Low Temperature Fuel Cells - 2 <i>Chaired by Ivan Tolj</i>
15:30-15:50	<u>W. Liu</u> , C. Zlotea - Nanosize effects on hydrogen trapping in palladium	<u>G. Radica</u> , I. Tolj, M. V. Lototskyy and S. Pasupathi - Techno-Economic Analysis of Hybrid systems with PEM Fuel Cell
15:50-16:10	<u>M.W. Davids</u> , T.K. Sekgobela, M.V. Lototskyy, S.A. Mozhzhukhin, A.A. Arbuzov, B.P. Tarasov - The Effect of Organic Acids and Graphene-Like Material on the Hydrolysis of Magnesium Hydride	<u>A. Martínez-Lázaro</u> , A.P. Mendoza, J. Ledesma-García, A. Arenillas and L.G. Arriaga - Un-supported PdCo Aerogel electrocatalyst to ethanol electrooxidation reaction
16:10-16:30	<u>Serge Nyallang Nyamsi</u> , Mykhaylo Lototskyy, Sivakumar Pasupathi, Volodymyr Yartys - Dehydrogenation performance of Mg-based hydride composite (Mg ₉₀ Ti ₁₀ +5wt. % graphite) from metal hydride containers equipped with basin-like extended surfaces	<u>I. Tolj</u> and Ž. Penga - Thermal Management of Edge-Cooled 1 kW Portable Proton Exchange Membrane Fuel Cell Stack
16:30-16:50	<u>Carmen M. Rangel</u> , V. R. Fernandes, António J. Gano - Metal hydride-based hydrogen production and storage system for stationary applications powered by renewable sources	

Wednesday November 10th

Invited Lecture #4

Chaired by Eleonora Bargiacchi

8:30-9:10 Kuo-Wei Huang - Fueling the Future

9:10-9:15

Break

Hydrogen Production from Thermochemical Processes - 1

Chaired by Alessandra Beretta

09:15-9:45 Matteo Ambrosetti, Lei Zheng, Alessandra Beretta, Gianpiero Groppi and Enrico Tronconi - Electrified methane steam reforming in packed SiC foams: an innovative concept for clean H₂ production

09:45-10:05 A. Felli, A. Toso, and M. Boaro - Enhancement of methane dry-reforming activity over A- sub-stoichiometric Ni exsolved LaMnO₃ perovskites

10:05-10:25 V.A. Shilov, S.V. Zazhigalov, V.N. Rogozhnikov, D.I. Potemkin, A.N. Zagoruiko, P.V.Snytnikov, V.A. Sobyenin - Verification of mathematical model of diesel steam and autothermal reforming

10:25-10:45 V.Piazza, R.Batista, G.Groppi and A.Beretta - Hydrogen production by formic acid cracking on Rh/Al₂O₃: a kinetic investigation in annular reactor

10:45-11:00

Break

High Temperature Fuel Cells - 2

Chaired by Chung-Jen Tseng

11:00-11:20 M. Lo Faro, S. C. Zignani, and A. S. Aricò - A simple customization for a solid oxide fuel cell to be fed with biofuels

11:20-11:40 H.P. Berg, M. Kleissl, A. Walther, A. Himmelberg and R. Dückerhoff - Flexibilisation of an MGT-SOFC hybrid system for electricity and hydrogen production for the realisation of a sustainable hydrogen economy

11:40-12:00 Azam Khan, I-Ming Hung - Synthesis of Sr(Ce_{0.6}Zr_{0.4})_{0.85}Y_{0.15}O_{3-δ}/Sm_{0.2}Ce_{0.8}O_{1.9} co-ionic conducting electrolyte for solid oxide fuel cells

12:00-12:20 A. A. Azhari, Sasmoko, and C. J. Tseng, R. Kusumastuti, K.R. Lee, M. Bhavanari - Thermal management and comparison of three different configurations of hydrocarbon fed IR-P-SOFC/GT hybrid system for high efficiency

12:20-12:30

G. Spazzafumo – Presentation of the World Online Community for Sustainable Technologies

12:30-13:30		Break
Power to X - 2 <i>Chaired by Johannes Gulden</i>		
13:30-13:50	S.C. Zignani, M. Lo Faro, A. Palella, L. Spadaro, A. Carbone, and A.S. Aricò - Performance and stability of a novel cell PGM-free during the CO ₂ and H ₂ O co-electrolysis in alkaline media	
13:50-14:10	D. Candelaresi, F. Indolfi, and G. Spazzafumo - Cogeneration of electric power and a substitute of natural gas based on Allam cycle	
14:10-14:30	J. Gulden, A. Sklarow, R. Sommer, J. Kirchner, C. Schweizer - Dynamic production of green methanol by controlling the CO ₂ flow	
14:30-14:35		Break
Hydrogen Production from Thermochemical Processes - 2 <i>Chaired by Antonio Chica</i>		
14:35-14:55	G. Iervolino, E. Meloni, and V. Palma - Electrification of dry reforming process using SiC based structured heating catalysts	
14:55-15:15	V. Piazza, A. Mostafa, V. Troisi, R. Batista, D. Gazzoli, G. Groppi and A. Beretta - Ethanol-to-H ₂ processes on Rh/Al ₂ O ₃ : kinetic study in annular reactor with insight on surface C-formation	
15:15-15:35	K.S. Motani, S.J. Roberts, L.D. Biquiza and J.C.Q. Fletcher - The effect of rhenium promotion on platinum/ceria catalyst activity for the water-gas shift reaction	
15:35-15:55	Abdelrahman Mostafa, Veronica Piazza, Roberto Batista, Alessandra Beretta, Gianpiero Groppi - Green H ₂ by Catalytic Partial Oxidation of Bioethanol on Rh Coated Monoliths: Impact of The Catalyst Support on Coking	
15:55-16:15	J.F. Da Costa-Serra, S. Maestro-Cuadrado and A. Chica - Ni and Co-based catalysts supported on ITQ-6 zeolite for hydrogen production by steam reforming of ethanol	
16:15-16:20		Break
Invited Lecture #5 & Closing session <i>Chaired by Aldo Bischi</i>		
16:20-17:00	Marco Verna and Valeria Bernardini - Dimensioning Green Hydrogen Plant for EU Climate Funding	
17:00-17:15	Concluding remarks	

Links to the recorded sessions:

[Opening Session and Invited Lecture#1](#)

[Electrolysis](#)

[Low temperature fuel cell - 1](#)

[Hydrogen Economy and Life Cycle Assessment](#)

[Invited Lecture#2](#)

[Poster](#)

[Invited Lecture#3](#)

[Safety, Standards & Regulations - H₂ Thermal & Combustion processes](#)

[Hydrogen Production from Renewable Energy Sources](#)

[High Temperature Fuel Cells - 1](#)

[Hydrogen Separation](#)

[Power to X - 1](#)

[Metal Hydrides](#)

[Low Temperature Fuel Cells - 2](#)

[Invited Lecture#4](#)

[Hydrogen Production from Thermochemical Processes - 1](#)

[High Temperature Fuel Cells - 2](#)

[Power to X - 2](#)

[Hydrogen Production from Thermochemical Processes - 2](#)

[Invited Lecture#5 & Closing session](#)