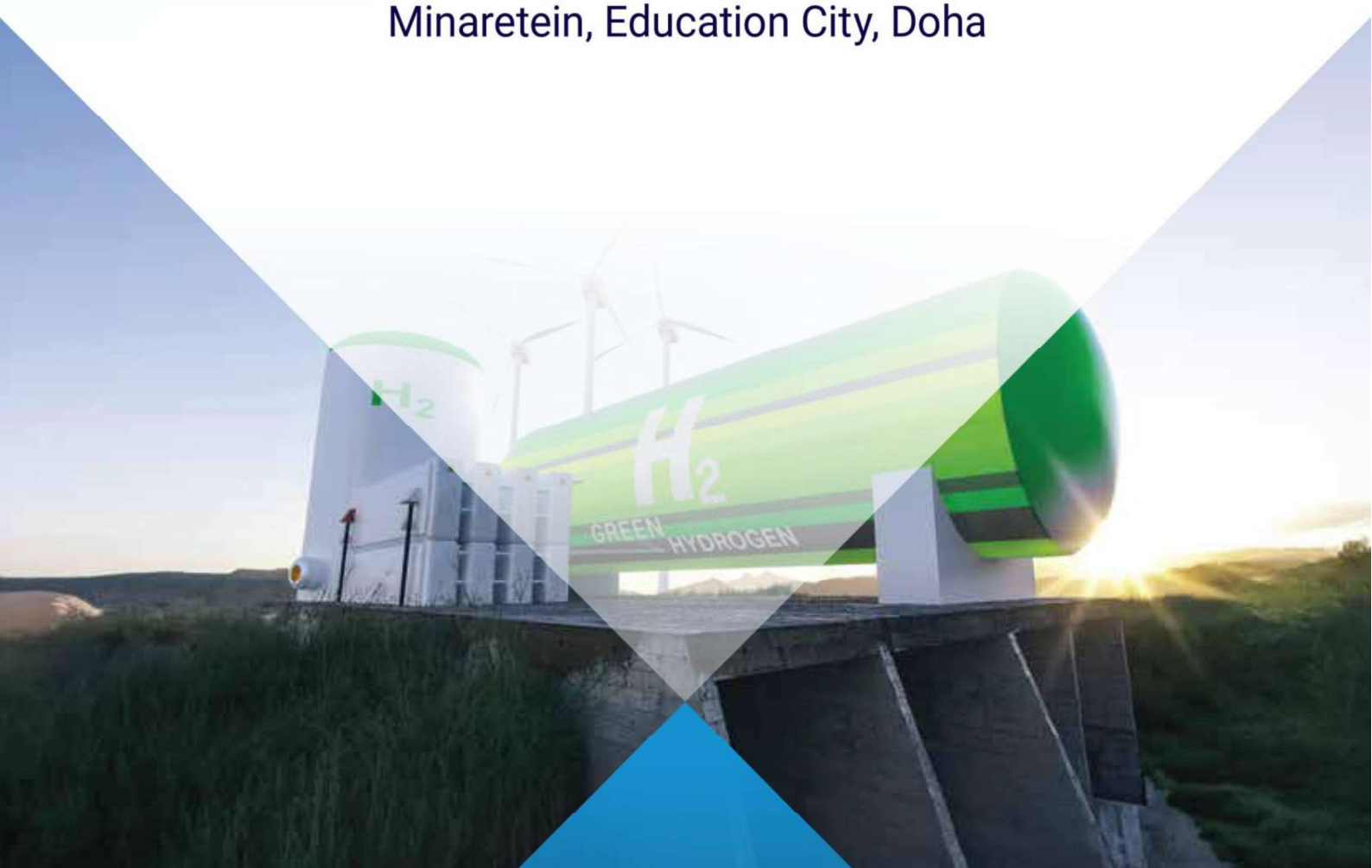
كلية العلوم والهندسة
College of Science & Engineering
جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY

14TH INTERNATIONAL CONFERENCE ON HYDROGEN PRODUCTION (ICH2P-2023)

DECEMBER 19 - 21, 2023

Minaretein, Education City, Doha



Program Layout

Day 1 | Tuesday, December 19, 2023		
08:00 am-9:00 am	Conference Registration	Exhibition Hall
09:00 am-10:00 am	**Opening Ceremony (Welcoming Talks)**	**Auditorium**
10:00 am-10:45 am	**Keynote Talks**	**Auditorium**
10:45 am-11:15 am	Coffee Break	Exhibition Hall
11:15 am-12:45 pm	**Keynote Talks**	**Auditorium**
12:45 pm-02:00 pm	Lunch	Exhibition Hall
02:00 pm-03:30 pm	**Industry Panel Session**	**Auditorium**
03:30 pm-04:00 pm	Coffee Break (with Poster Presentations)	Exhibition Hall
04:00 pm-05:30 pm	**Parallel Scientific Sessions**	**Conference Rooms**
Day 2 | Wednesday, December 20, 2023		
09:00 am-10:30 am	**Plenary Sessions**	**Auditorium**
10:30 am-10:45 am	Coffee Break (with Poster Presentations)	Exhibition Hall
10:45 am-12:30 pm	**Parallel Scientific Sessions**	**Conference Rooms**
12:30 pm-02:00 pm	Lunch	Exhibition Hall
02:00 pm-03:30 pm	**Parallel Scientific Sessions**	**Conference Rooms**
03:30 pm-04:00 pm	Coffee Break (with Poster Presentations)	Exhibition Hall
04:00 pm-05:30 pm	**Parallel Scientific Sessions**	**Conference Rooms**
06:30 pm-08:30 pm	Gala Dinner and Awards Ceremony	
Day 3 | Thursday, December 21, 2023		
09:00 am-06:15 pm	**Hydrogen Energy Course**	**Auditorium**
09:00 am-10:30 am	**Parallel Scientific Sessions**	**Conference Rooms**
10:30 am-11:00 am	Coffee Break (with Poster Presentations)	Exhibition Hall
11:00 am-12:30 pm	**Parallel Scientific Sessions**	**Conference Rooms**
12:30 pm-02:00 pm	Lunch	Exhibition Hall
02:00 pm-03:30 pm	**Parallel Scientific Sessions**	**Conference Rooms**
03:30 pm-04:00 pm	Coffee Break (with Poster Presentations)	Exhibition Hall
04:00 pm-05:30 pm	**Parallel Scientific Sessions**	**Conference Rooms**
06:15 pm-06:30 pm	**Closing Ceremony**	**Auditorium**
06:30 pm-09:30 pm	**Optional Social Tour**	

Day 1 | Tuesday, December 19, 2023

Time	Program	Location
08:00 am-09:00 am	**Conference Registration**	**Exhibition Hall**
09:00 am-10:00 am	**OPENING CEREMONY** **Dr. Ala Al-Fuqaha** Associate Provost Hamad Bin Khalifa University **Dr. Yusuf Bicer** Co-Chair of the Conference Hamad Bin Khalifa University **Dr. Tareq Al-Ansari** Co-Chair of the Conference Hamad Bin Khalifa University **Dr. Mounir Hamdi** Dean, College of Science and Engineering Hamad Bin Khalifa University **H.E. Dr. Mohammed Bin Saleh Al-Sada** Former Minister of Energy and Industry in Qatar Chairman of the Joint Advisory Board of Texas A&M University at Qatar Chairman of the Board of Trustees of the Doha University of Science and Technology	**Auditorium**
Keynote Talks		
10:00 am-10:45 am	**ICH2P14-KN1** New Horizons in Hydrogen Production Technologies **Keynote Speaker - Dr. Ibrahim Dincer** Professor, Ontario Tech University, Canada	**Auditorium**
10:45 am-11:15 am	**Coffee Break**	**Exhibition Hall**

Day 1 | Tuesday, December 19, 2023

11:15 am-12:00 pm	**ICH2P14-KN2** Development of Manufacturing Techniques for Highly Performing Polymer Electrolyte Membrane Fuel Cells **Keynote Speaker – Dr. Xianguo Li** Professor, University of Waterloo, Canada	**Auditorium**
12:00 pm-12:45 pm	**ICH2P14-KN3** Hydrogen and Fuel Cell Development and the Benefit of Digital Twin and Artificial Intelligence in this field **Keynote Speaker - Dr. Abdul Ghani Olabi** Professor, University of Sharjah, UAE	**Auditorium**
12:45 pm-02:00 pm	Lunch	**Exhibition Hall**
02:00 pm-03:30 pm	**Industry Panel Session** **Moderator:** **Sean van der Post** Global Offshore Business Director, Lloyd's Register	**Auditorium**

Day 1 | Tuesday, December 19, 2023

Poster Number	Poster Presentations 3:30 PM - 4:00 PM Chair: **Dr. Burak Yuzer**	Exhibition Hall
ICH2P14 – PP175	Turquoise Hydrogen Production: Carbon Management and Conversion to Sustainable Energy Carriers ***Aliya Banu*, *Yusuf Bicer***	
ICH2P14 – PP166	Evaluation of Hydrogen Production from Ammonia Reforming on Ni/ZnO Nanowire Catalysts ***Hiroya Tamai*, *Hironori Nakajima***	
ICH2P14 – PP114	Photocatalytic Hydrogen Generation from Seawater Using High Performance Polymeric Materials ***Noora Al-Subaiei*, *Ghalya Abdulla*, *Mohammed Al-Hashimi*, *Konstantinos E Kakosimos***	
ICH2P14 – PP008	Long-Term Assessment of Hydrogen Technology Deployment for Large Scale Decarbonisation of Power Production ***Kamran Khammadov*, *Damian Flynn*, *Eoin Syron***	
ICH2P14 – PP 013	Use of Refinery Off Gas (ROG) as CO_2 Emission Reduction and Natural Gas (Ng) Savings in Hydrogen (H_2) Production ***Marcelo Tagliabue***	
ICH2P14 – PP139	Performances of Commercial Zeolites with Different Acidities for Catalytic CO_2 Hydrogenation to Dimethyl Ether Using Copper/Zinc/Alumina Catalyst ***Abdelbaki Benamor*, *Assem Mohamed*, *Abdul Hakeem Anwer*, *Siham AlQaradawi*, *Mohammed Saad***	
ICH2P14 – PP075	Modeling of Hydrogen Liquifaction Process Parameters Using Advanced Artificial Intelligence Technique ***A. Abdallah El Hadj*, *Ait yahia, Hamza. K*, *M. Laidi*, *S. Hanini***	
ICH2P14 – PP066	Hydrogen Protection of the Mechanical Properties and Electrochemical Effects by Bio-Corrosion Inhibitors on Carbon Steel in the Presence of Aggressive Media ***Mouna Amara*, *Azedine Belalia*, *Mohammed HadjMeliani*, *Hadjer Didouh*, *Rami K.Suleiman*, *Guy Pluvinage***	
ICH2P14 - PP192	Hydrogen from Catalytic Steam Reforming of Biomass ***Sergio Rapagnà*, *Alessandro Antonio Papa*, *Andrea Di Carlo***	
ICH2P14 - PP161	Textile Wastewater Treatment and Hydrogen Generation with Ion-Exchange Resins on Solar-Assisted Bipolar Membrane Electrolysis Process ***Burak Yuzer*, *Ragad F. Alshebli*, *Nadira Salsabila*, *Yusuf Bicer***	
ICH2P14 - PP170	In-Situ Current Distribution Measurements of a Planar Solid Oxide Fuel Cell for a Three-Dimensional Finite Element Model to Train a Machine-Learning Surrogate Model ***Yutaro Io*, *Yingtian Chi*, *Hironori Nakajima***	

Day 1 | Tuesday, December 19, 2023

Parallel Sessions 1

Time	Auditorium	Conference Room – A048	Conference Room – A046
04:00 pm-05:30 pm	**Session 1A:** **Clean Hydrogen Production** Chair: **Dr. Fadwa ElJack** Co-Chair: **Dr. Fares A. Almomani**	**Session 1B:** **Waste to Hydrogen Energy** Chair: **Dr. Tareq Al-Ansari** Co-Chair: **Dr. Mohammad Alherbawi**	**Session 1C:** **Hydrogen Production Catalysts** Chair: **Dr. Abdulkarem Amhamed** Co-Chair: **Dr. Ahmed Abdala**
04:00 pm-04:15 pm	**Invited Talk** **ICH2P14-IT1** Green Hydrogen Production: Solar Chimney Power Plant Integrated with Water Desalination Plant **Dr. Fares A. Almomani** Department of Chemical Engineering, Qatar University	**ICH2P14 - OP010** A Novel Cost-Effective Approach for Production of Hydrogenase Enzymes and Molecular Hydrogen from Whey-Based By-Products ***Anna Poladyan, Meri Iskandaryan, Ofelya Karapetyan, Ela Minasyan, Anait Vassilian, Karen Trchounian, Garabed Anatranikian***	**ICH2P14 - OP037** Synergizing Hydrogen and Chlorine Gas Production for Enhanced Resource Utilization Using Earth-Abundant Electrocatalysts ***Ahmed Badreldin, Ahmed Abdel-Wahab***
04:15 pm-04:30 pm		**ICH2P14 - OP044** Biotechnological Potential of Spent Coffee Grounds for Large-Scale Hydrogen Production ***Liana Vanyan, Anait Vassilian, Anna Poladyan, Karen Trchounian***	**ICH2P14 - OP171** Ni-Cu Bimetallic Catalysts for Effective Syngas Production via Low-Temperature Methane Steam Reforming ***Martin Khzouz, Babak Fakhim, Saleh Babaa, Mohammad Ghaleeh, Farooq Sher, Evangelos I. Gkanas***
04:30 pm-04:45 pm	**ICH2P14 – OP095** A Solar Pond Integrated with Bifacial Solar Panels for Power and Hydrogen Generation ***Dogan Erdemir, Ibrahim Dincer***	**ICH2P14 – OP069** Biohydrogen Production from Various Industrial Wastewater of Chalawa, Kano, Nigeria ***Garba Uba, Abdulhadi Yakub, Salisu Ahmed, Ibrahim Abdulganiyyu***	**ICH2P14 - OP017** Kinetic Modelling and Process Optimization for Blue Hydrogen Production Via Ammonia Cracking ***Ragad Aldilaijan, Sai Katikaneni, Osamah Siddiqui, Mohammad Rakib, Bandar Solami***
04:45 pm-05:00 pm	**ICH2P14 – OP205** PV-AWG-H_2: A Potential Method for Sustainable Hydrogen Production in Qatar ***Aiyad Gannan, Nagi Abdussamie***	**ICH2P14 – OP102** Syngas Production Using Catalyst Based on Local Minerals Extruded as Honeycomb Monolith ***Tarik Chafik***	**ICH2P14 – OP122** Synthesis, Characterization, and Application of Bio-Templated Ni-Ce/Al_2O_3 Catalyst for Clean H_2 Production in the Steam Reforming of Methane Process ***Mohammad Reza Rahimpour, Maryam Koohi-Saadi***
05:00 pm-05:15 pm	**ICH2P14 - OP083** Design and Performance Analysis of Green Hydrogen Production from Hybrid Solar PV/Wind Turbine Energy System ***Chaouki Ghenai***	**ICH2P14 – OP125** Green Energy from Waste: A Systems Engineering Approach to Bio-Hydrogen Production ***Salman Raza Naqvi, Bilal Kazmi, Syed Ali Ammar Taqvi, Imtiaz Ali, Muhammad Shahbaz***	**ICH2P14 – OP211** Integrated SMR System for Efficient Hydrogen and Power Production ***Abdullah A. AlZahrani, Mansur Aliyu***
05:15 pm-05:30 pm	**ICH2P14 – OP123** Green Hydrogen Based Ammonia Production Process: Insight into Energy and CO_2 Emissions Minimization ***Swaprabha P. Patel, Ashish M. Gujarathi, Piyush Vanzara***	**ICH2P14 – OP113** Development of a Hydrogen Production Model for The Gasification of Municipal Solid Waste and Its Constituents Using Aspen Plus Using Cao for CO_2 Capture ***Muhammad Shahbaz, Prakash Parthasarathy, Mohammad Alherbawi, Gordon McKay, Tareq Al-Ansari***	**ICH2P14 - OP144** Hydrogen Production Via Steam Reforming of Methanol (SRM) Using Cu/ZnO/Al_2O_3 Catalyst ***Masresha Adasho Achomo, P. Muthukumar, Nageswara Rao Peela***

End of the Day

Day 2 | Wednesday, December 20, 2023

Time	Plenary Session	Location
09:00 am - 09:45 am	**ICH2P14-KN4** Sustainable Feedstocks and Integrated Bioprocess for Biohydrogen Production in Arid and Desert Regions **Keynote Speaker - Dr. Moktar Hamdi** Professor, National Institute of Applied Sciences and Technology, University Carthage, Tunisia	**Auditorium**
09:45 am - 10:30 am	**ICH2P14-KN5** A Framework to Evaluate Economics and CO2 Fixation potential of New Carbon Capture and Utilization (CCU) Reaction Pathways – Towards Golden Hydrogen Production **Keynote Speaker - Dr. Nimir Elbashir** Professor, Chemical Engineering, Director TEES Gas and Fuels Research Center, Texas A&M University at Qatar	**Auditorium**
10:30 am - 10:45 am	**Coffee Break with Poster Presentations**	**Exhibition Hall**

Poster Number	Poster Presentations 10:30 am-10:45 am Chair: **Dr. Burak Yuzer**	Exhibition Hall
ICH2P14 – PP117	Redox Regulation of Hydrogen Production in Escherichia Coli During Growth on Byproducts of the Wine Industry ***Lusine Baghdasaryan, Ofelya Karapetyan, Karen Trchounian, Garabed Antranikian, Anna Poladyan***	
ICH2P14 – PP118	Comparative Economic Analysis of Small Modular Reactor Hydrogen Cogeneration and Conventional Gas-Fired Plant for Load Following: A Case Study ***Derrick Whelan, Lixuan Lu***	
ICH2P14 – PP124	Ship Design Adaptations for LNG Propulsion, Carbon Capture Utilization, and Hybrid Technologies ***Aisha Al-Asmakh, Yusuf Bicer, Tareq Alansari***	
ICH2P14 – PP128	Green Hydrogen Production: A Cost Comparison of Different Electrolysis Technologies ***Hafiz Muhammad Uzair Ayub, Sabla Y. Alnouri***	
ICH2P14 – PP012	Comparative Study Between GBO and BES Optimization Algorithms for Optimal PEMFC Parameters Identification ***Ahmed Zouhir Kouache, Ahmed Djafour, Khaled Mohammed Said Benzaoui, Souheil Touili***	
ICH2P14 – PP172	Integrated Hydrogen Production and Purple Phototrophic Bacteria Biomass Recovery via Electrocoagulation ***Ojima Wada, Burak Yuzer, Yusuf Bicer, Gordon McKay, Hamish Mackey***	
ICH2P14 – PP188	Hydrogen Naval Propulsion: Problems and Solutions ***Remili Sadia, Mohamed Chaimaa***	
ICH2P14 - PP186	Study of the Energy and Financial Performance of Hydrogen Production with Solar Energy and Photoelectrolyzer/PEM in the Algerian Desert Region (OUARGLA) ***Madjeda Ramdani, Ahmed Djafour, El Mouatez Billah Messini, Ahmed Zouhir Kouache, Zineb Bensaci***	
ICH2P14 – PP014	Investigating the Effect of Using Hydrogen as a Fuel on Performances of Gas Turbine Operating at Lean Condition in Site of Hassi R'MEL ***Fethia AMROUCHE, Bouziane Mahmah, Lidya Boudjemaa, Oum Keltoum Bari***	

Day 2 | Wednesday, December 20, 2023

Parallel Sessions 2

Time	Auditorium	Conference Room – A048	Conference Room – A046
10:45 am-12:30 pm	**Session 2A:** **Hydrogen Storage** Chair: **Dr. Fadwa El Mellouhi** Co-Chair: **Dr. Dhabia M. Al-Mohannadi**	**Session 2B:** **Bio-Hydrogen** Chair: **Dr. Ibrahim M. Abu-Reesh** Co-Chair: **Dr. Burak Yuzer**	**Session 2C:** **Low-Carbon Hydrogen with Reforming** Chair: **Dr. Anand Kumar** Co-Chair: **Dr. Mohammad Alherbawi**
10:45 am-11:00 am	**Invited Talk** **ICH2P14-IT2** Iron Based Hydrogen Storage and Transport **Dr. Viktor Hacker** Professor, Graz University of Technology, Institute of Chemical Engineering and Environmental Technology, Austria	**ICH2P14 – OP024** Biogas Dry Reforming to Syngas Using Catalyst Based on Local Minerals Extruded as Honeycomb Monolith ***Tarik Chafik***	**Invited Talk** **ICH2P14-IT3** Analyzing Grey and Blue Hydrogen Production Costs in Steam-Methane, Auto-Thermal, and Non-Catalytic Partial Oxidation Reforming Plants ***Mary Katebah, Ma'moun Al-Rawashdeh, Patrick Linke*** Texas A&M University at Qatar
11:00 am-11:15 am		**ICH2P14 – OP197** A Net-Zero Emission System with Biogas-Fed Solid Oxide Fuel Cell for Hydrogen Production to Advance Sustainability in the Textile Industry ***Baraka Abbas, Hooreen Ansari, Kabsha Zain, Wasifa Umer, Abeeha Fatima, Khurram Kamal, Tahir A.H. Ratlamwala***	
11:15 am-11:30 am	**ICH2P14 – OP133** Graded Gyroid-Enhanced Metal Hydride Container for Efficient Hydrogen Storage Application ***Luthfan Adhy Lesmana, Muhammad Aziz***	**ICH2P14 - OP048** Biogas Production from Date Palm Fruit Waste in Jigawa State Nigeria ***Abdulhadi Yakubu, Garba Uba, Zainab Abbas Abdulhadi, Ahmed Muhammad Gumel***	**ICH2P14 - OP091** Piston Reactor Capabilities to Make Hydrogen from Methane Via Steam and Autothermal Reforming – Modeling Study ***Aya Abousrafa, Patrick Linke, Ma'moun Al-Rawashdeh***
11:30 am-11:45 am	**ICH2P14 - OP027** Transportation and Storage of Hydrogen by LOHC: Design and Simulation of the Dehydrogenation Reactor ***Pietro Delogu, Elena Barbera, Andrea Mio, Alberto Bertucco, Maurizio Fermeglia***	**ICH2P14 – OP049** Production of Bioethanol from Groundnut Shell as a Substrate ***Abdulhadi Yakubu, Garba Uba, Zainab Abbas Abdulhadi***	**ICH2P14 – OP023** Membrane Reformer Technology for Sustainable Hydrogen Production from Hydrocarbon Feedstocks ***Alaa Albasry, Ahmed Naimi, Abdulbari Alqarni, Minseok Bae, Bandar Solami, Stephen Paglieri, Aadesh Harale***
11:45 am-12:00 pm	**ICH2P14 – OP126** Methods of Hydrogen Production, Storage and Transportation ***Sayel M. Fayyad, A.m. Maqableh***	**ICH2P14 - OP165** Hydrogen Gas and Biochar Production from Kitchen Waste Via Dark Fermentation ***Sniqdhendubala Pradhan, Burak Yuzer, Yusuf Bicer, Gordon Mckay***	**ICH2P14 – OP057** Catalytic Conversion of CO_2 to CO Via Methane Dry Reforming and Reverse Water Gas Shift Reaction ***Parisa Ebrahimi, Mohammed Al-Marri, Majeda Khraisheh, Anand Kumar***
12:00 pm-12:15 pm	**ICH2P14 – OP109** Multi-Response Optimization of Absorption and Desorption Parameters in a Metal Hydride Based Hydrogen Storage System ***Alok Kumar, Purushothaman Nandagopalan, P. Muthukumar, Ranjith Thangavel***	**ICH2P14 – OP067** An Optimum Approach for Biohydrogen Production Using Poplar ***A. Yagmur Goren, Muratcan Kenez, Ibrahim Dincer, Ali Khalvati***	**ICH2P14 - OP155** Enhancing Ni-Supported Catalysts for Efficient Dry Reforming of Methane: Effects of Halloysite Nanotubular Clay Surface Activation ***Ahmed Abotaleb, Dema Al-Masri, Alaa Alkhateb, Kamal Mroue, Atef Zekri, Yasmin Mashhour, Alessandro Sinopoli***
12:15 pm-12:30 pm	**ICH2P14 - OP031** Experimental Investigation on Novel Multi-Tube Metal Hydride Reactor for Large Capacity Hydrogen Storage Applications ***Shubham Parashar, P. Muthukumar, Atul Kumar Soti***	**ICH2P14 – OP087** Biomethanol and Hydrogen Production from Pinecone Biomass Using Steam Gasification ***Hilal Sayhan Akci Turgut, Ibrahim Dincer***	**ICH2P14 - OP047** The Hydrogen Production Using Steam Methane Reforming Based on Central Receiver ***Ali Alaidaros, Abdullah A. AlZahrani***
12:30 pm-02:00 pm **Lunch** **Exhibition Hall**			

Day 2 | Wednesday, December 20, 2023

Parallel Sessions 3			
Time	**Conference Room – A047**	**Auditorium**	**Conference Room – A046**
02:00 pm-03:30 pm	**Session 3A:** **Electrochemical Hydrogen** Chair: **Dr. Ahmed Abdala** Co-Chair: **Dr. Dogan Erdemir**	**Session 3B:** **Decarbonization through Hydrogen** Chair: **Dr. Marcello Contestabile** Co-Chair: **Dr. Luluwah Al-Fagih**	**Session 3C:** **Hydrogen in Transportation Applications** Chair: **Dr. Sertac Bayhan** Co-Chair: **Dr. Abdulla Al Wahedi**
02:00 pm-02:15 pm	**ICH2P14 - OP064** Effect of Volume Concentration and Sonication Time on the Performance of Hybrid Solar Collector Based Hydrogen Production System with Hybrid Nanofluid: An Experimental Investigation ***M.Baskaran, S.Senthilraja R. Gangadevi, Mohamed M. Awad***	**Invited Talk** **ICH2P14-IT4** In the Green Zone: Navigating Carbon Management in the Hydrogen Shift **Dr. Muftah El-Naas** Professor, Chemical Engineering, Qatar University	**ICH2P14 - OP007** Carbon Emission Reductions in the University of Sao Paulo's Transportation Sector Using Hydrogen-Powered Vehicles ***Beethoven Narváez-Romo, Danilo Perecin, Thiago Lopes, Daniel Lopes, Karen Mascarenhas, Suani Coelho, Julio R. Meneghini***
02:15 pm-02:30 pm	**ICH2P14 - OP073** Solar Energy Driven Silicon Photovoltaic Monolithic Electrochemical Cells for Efficient Hydrogen Production from Water ***Mourad Frites, Shahed Khan***		**ICH2P14 – OP020** Experimental Investigation of Diesel Engine in Dual Fuel Mode by Using Hydrogen and Low Carbon Ether Blended Diesel ***Vasanthakumar Ravisankar, Loganathan Marimutthu, Vikneswaran Malaiperumal***
02:30 pm-02:45 pm	**ICH2P14 - OP163** Seawater Desalination and Hydrogen Production Using Monovalent Selective Membranes Assisted with Ion-Exchange Resins for Hydroponic Solution Production ***Ragad F. Alshebli, Nadira Salsabila, Burak Yuzer, Yusuf Bicer***	**ICH2P14 - OP159** Developing A Sustainable Production Framework for Green Hydrogen to Decarbonize Existing Industrial Clusters ***Afreenuzzaman Badruzzaman, Fadwa Eljack, Seckin Karagoz***	**ICH2P14 - OP150** Driving Toward Hydrogen Mobility: A Life Cycle Cost Analysis of Traditional, Electric, And Hydrogen Fuel Cell Vehicles in Qatar ***Carlos Méndez, Marcello Contestabile, Yusuf Biçer***
02:45 pm-03:00 pm	**ICH2P14 - OP085** Design Considerations of Artificial UV Light-Driven Photocatalytic Water Splitting for Production of Hydrogen in a Combined Solar/Artificial Light Reactor ***Ahmed Abbas, Shohda Makki, Konstantinos E. Kakosimos***	**ICH2P14 - OP164** Decarbonizing ASEAN By 2050: From the Lens of a Hydrogen Economy ***Archana Kumaraswamy, Sushant S Garud, Iftekhar A Karimi, Shamsuzzaman Farooq***	**ICH2P14 – OP099** An Adaptation of The Conventional LNG Floating Storage and Regasification Unit to Hydrogen and Ammonia ***Dindha Andriani, Muhammad Usman Sajid, Yusuf Bicer***
03:00 pm-03:15 pm	**ICH2P14 - OP174** Electrochemcial Conversion of Carbon Dioxide into Formic Acid as Hydrogen Carrier: Role of Anolyte ***Muhammad Arsalan, Muftah H. El-Naas***	**ICH2P14 - OP177** Shades Of Sustainability: An In-Depth Analysis of The Direct and Indirect Carbon Footprint in Blue Ammonia Manufacturing ***Hussein Al-Yafei, Ahmed AlNouss, Saleh Aseel***	**ICH2P14 – OP130** Exergetic Analysis of the Process for Hydrogen Rich Syngas Production Through Biomass Gasification and Its Onsite Use in HCCI Engine for Land Transportation ***Tawfiq Al-Mughanam, Abdul Khaliq***
03:15 pm-03:30 pm	**ICH2P14 - OP074** Evaluation of a Novel Hybrid Photoelectrochemical-Conventional Hydrogen Generator ***Mehmet Gursoy, Ibrahim Dincer***	**ICH2P14 – OP190** Feasibility Study of Backing Up Energy Supply For Electric Charging Stations With Hydrogen Integration ***Huseyin Bıyıkcı, Yusuf Bicer***	**ICH2P14 – OP110** Development of a Hybrid Powering System with Ammonia Fuel Cells and Internal Combustion Engine for Submarines ***Ibrahim Akgun, Ibrahim Dincer***
Coffee Break with Poster Presentations **Exhibition Hall**			

Day 2 | Wednesday, December 20, 2023

Poster Number	Poster Presentations 03:30 pm-04:00 pm Chair: **Dr. Burak Yuzer**	Exhibition Hall
ICH2P14 – PP041	Fast Modeling Method of Gas Diffusion Layers of Polymer Electrolyte Membrane Fuel Cells ***Hamid Reza Taheri, Mohsen Shakeri***	
ICH2P14 – PP101	$La_{0.6}Sr_{0.4}Co_{0.2}\ Fe_{0.8}O_{3-\delta}$ (LSCF) Cathode Supported on Gadolinium-Doped Ceria Electrolyte Prepared by Screen-Printing Method and Performances Evaluation as Solid Oxide Fuel Cell at Intermediate Temperature ***Oumaima Ettalibi, Hicham Ben Brahim Sbitri, Abdessamad Samid, Ouafae Achak, Raphael Ihringer, Tarik Chafik***	
ICH2P14 – PP015	Sorption Properties of Ball-Milled Porous Silicon for Hydrogen Storage Up to 80 Bar ***Rama Chandra Muduli, Paresh Kale***	
ICH2P14 – PP016	Evaluation of Synergistic Integration of Nickel, Porous Silicon, and Thermally Reduced Graphene Oxide for Hydrogen Storage ***Rama Chandra Muduli, Neeraj Kumar Nishad, Paresh Kale***	
ICH2P14 – PP108	Hydrogen Adsorption Characteristics of Activated Carbon Derived from Prickly Pear Seed Cake ***Rimene Dhahri, Imen Tlili***	
ICH2P14 – PP154	Facilitating Production of Acetate and Hydrogen Through Enhanced Electron Transfer and Substrate Mass Transfer Using a Multifunctional Photocathode with Nio/G-C_3N_4/Polythiophene ***Abdul Hakeem Anwer, Assem Mohamed, Nafees Ahmed, Abdelbaki Benamor***	
ICH2P14 – PP167	Recovery Of Spent Acidic and Alkaline Liquors Generated in Metal Industry and Hydrogen Production by An Integrated System ***Huseyin Selcuk, Yusuf Gunes, Ayse Elif Ates, Burak Yuzer, Yusuf Bicer***	
ICH2P14 – PP105	Neural network for the prediction of Biohydrogen Production during Dark Waste Organic Biomass Fermentation ***Fares Almomani***	
ICH2P14 – PP201	Recent Technological Development and Advancements in Hydrogen Storage Technologies ***Abhishek Sharma, Mohit Nayal, Siddharth Jain, Varun Pratap Singh***	

Day 2 | Wednesday, December 20, 2023

Parallel Sessions 4

Time	Conference Room – A047	Auditorium	Conference Room – A046
04:00 pm-05:30 pm	**Session 4A:** **Green Hydrogen Production** Chair: **Dr. Hicham Hamoudi** Co-Chair: **Dr. Ahmed AlNouss**	**Session 4B:** **Hydrogen Techno-Economics** Chair: **Dr. Ahmed Khalifa** Co-Chair: **Dr. Ikhlas Ghiat**	**Session 4C:** **Integrated Hydrogen Production Systems** Chair: **Dr. Ahmad K. Sleiti** Co-Chair: **Dr. Abdullah A. AlZahrani**
04:00 pm-04:15 pm	**ICH2P14 – OP082** Green Hydrogen Production and Solar to Hydrogen Ratio Using Bifacial Solar Photovoltaics and High Roof Surface Albedo ***Fahad Ahmad Faraz, Oussama Rejeb, Chaouki Ghenai***	**Invited Talk** **ICH2P14-IT5** Future and Potential of Hydrogen for Qatar Under Its Energy and Economic Transformation Quest **Dr. Muammer Koc** Professor, Division of Sustainable Development, College of Science and Engineering, Hamad Bin Khalifa University	**ICH2P14 - OP094** Innovative Integrated Multigeneration System for Sustainable Power, Hydrogen, and Ammonia Production ***Ahmad K. Sleiti, Wahib A. Al-Ammari, Mohammad Azizur Rahman***
04:15 pm-04:30 pm	**ICH2P14 – OP029** Green Hydrogen Production by Hydrolysis of Aluminum and Waste Recycling ***Pedro Ayala, Edgar Borja, P.J Sebastian***		**ICH2P14 - OP009** Transient Simulation and Comparative Assessment of Two Concentrated-Solar Based Hydrogen Production Systems Integrated with Vanadium-Chlorine Thermochemical Cycle ***Erfan Zand, Mohammadreza Khosravi, Pouria Ahmadi, Mehdi Ashjaee***
04:30 pm-04:45 pm	**ICH2P14 – OP018** Solar Hydrogen Production with Direct and Indirect Design System ***Ilyès Nouicer, Sabah Menia, Fares Meziane, Nourdine Kabouche, Chaouki Ghenai***	**ICH2P14 - OP036** A Techno-Economic Evaluation of the Integration of Direct Air Capture with Hydrogen and Solar Fuel Production ***Enric Prats-Salvado, Nathalie Monnerie, Christian Sattler***	**ICH2P14 – OP104** Green Hydrogen Production via Integrated Triple Technologies: Downdraft Tower, Photovoltaic and Electrolysis ***Emad Abdelsalam, Fares Almomani***
04:45 pm-05:00 pm	**ICH2P14 - OP025** Thermoelectric Condensation of Ambient Humidified Air for Green Hydrogen Production ***Hilal Ahmad, Taqi Ahmad Cheema, Hadeed Ahmed Sher***	**ICH2P14 - OP176** Flowsheet Safety and Techno-Economic Analysis of Optimum Ammonia and Urea Production Route ***Amzan Alsabri, Ahmed AlNouss, Fadwa ElJack***	**ICH2P14 – OP089** Electricity Hydrogen and Heat (EHH) Production in Stand-Alone Renewable Energy System ***El Manaa Barhoumi, Ikram Ben Belgacem, Manaf Zghaibeh, Mohamed Ouda***
05:00 pm-05:15 pm	**ICH2P14 – OP187** Optimum Green Hydrogen Production Through Biomass Feedstock Blending ***Ahmed AlNouss, Gordon Mckay, Tareq Al-Ansari***	**ICH2P14 - OP096** Techno-Economic Evaluation of Various Hydrogen Carriers ***Ahmad K. Sleiti, Laveet Kumar, Wahib A. Al-Ammari***	**ICH2P14 – OP080** A Clean Option for Potential Hydrogen Production Via Nuclear in Canada ***Gorkem Kubilay Karayel, Ibrahim Dincer***
05:15 pm-05:30 pm	**ICH2P14 – OP111** An Integrated Solar-Driven Chlor-Alkali System for Hydrogen and Chlorine Production ***Sümeyya Ayça, Ibrahim Dincer***	**ICH2P14 – OP193** Strategy Of Turkiye on Hydrogen Energy ***Serpil Edebali, Mustafa Ersoz***	**ICH2P14 – OP088** A Study on Nuclear-Based Hydrogen Production System Via Three- and Four-Step Magnesium Chlorine Cycles ***Şulenur Asal, Adem Acır, Ibrahim Dincer***
06:30 pm-08:30 pm **Gala Dinner and Awards Ceremony** **Hotel**			

Day 3 | Thursday, December 21, 2023

Parallel Sessions 5			
Time	**Conference Room – A047**	**Conference Room – A048**	**Conference Room – A046**
09:00 am-10:30 am	**Session 5A:** **Life Cycle Assessment of Hydrogen** Chair: **Dr. Mohamed Haouari** Co-Chair: **Dr. Tareq A. Al-Ansari**	**Session 5B:** **Hydrogen in Grids and Communities** Chair: **Dr. Patrick Linke** Co-Chair: **Dr. Veronica Bermudez**	**Session 5C:** **Hydrogen Effects on Materials** Chair: **Dr. Ibrahim Galal Hassan** Co-Chair: **Dr. Afrooz Barnoush**
09:00 am-09:15 am	**ICH2P14 – OP084** Life Cycle Assessment of Green Hydrogen Supply Network ***Dana Alghool, Mohamed Haouari, Paolo Trucco***	**ICH2P14 - OP056** Multi-Scenario Analysis of Levelized Cost of Hydrogen for Water Electrolysis-Photovoltaic Energy Technology in the Near Future (2025–2050) of Algeria ***Hammou Tebibel, Abdelhamid M'raou***	**ICH2P14 – OP134** The Correlation of Porous Material's Properties Between Particle Geometry for Hydrogen Fuel And Electrolysis Cells ***Jaeyeon Kim, Luthfan Adhy Lesmana, Muhammad Aziz***
09:15 am-09:30 am	**ICH2P14 – OP180** Life Cycle Assessment of a Direct Air Capture and CO_2 Utilization System ***Aliya Banu, Namra Mir, Muftah H. El-Naas, Ahmed Ali Khalifa, Abdulkarem I. Amhamed, Yusuf Bicer***	**ICH2P14 - OP142** Optimizing Green Hydrogen and Power Generation from Urban Sewage Sludge in the Steel Industry: A Kerman Case Study ***Saeed Edalati, Mohammadreza Khosravirad***	**ICH2P14 – OP112** Influence Of Hydrogen Uptake on Additively Manufactured and Conventional Austenitic Stainless Steels 316l ***Qingyang Liu, Sumia Manzoor, Mohammad Tariq, Hanan Farhat, Afrooz Barnoush***
09:30 am-09:45 am	**ICH2P14 - OP178** Tank To Tank Life Cycle Assessment of Greenhouse Gas Emission from Methanol Plant ***Hussein Al-Yafei, Ahmed AlNouss, Saleh Aseel, Mohannad AlJarrah, Tareq Al-Ansari***	**ICH2P14 - OP097** Maximizing Power Grid Resilience: Rolling Horizon Control for Output Power Smoothing in Islanded Wind-Solar Microgrids with Multiple Hydrogen Storage Tanks ***Muhammad Bakr Abdelghany, Ahmed Al-Durra***	**ICH2P14 – OP046** In-House Green Anti-Corrosion Inhibitor to Protect from Hydrogen Embrittlement Effect on the Structural Integrity of Api 5l Steel Pipeline ***Mohammed HadjMeliani, Hadjer Didouh, Mouna Amara, Azedine Belalia, Rami K.Suleiman, Guy Pluvinage***
09:45 am-10:00 am	**ICH2P14 – OP106** An Integrated Life Cycle Assessment and Supply Chain Analysis of a Multi-Generation System for Renewable Clean Power and Green Hydrogen Production ***Tahir Abdul Hussain Ratlamwala, Sheikh Muhammad Ali Haider, Khurram Kamal***	**ICH2P14 - OP173** Circular Economy of integrating Green Hydrogen Production within an Eco-Industry Park ***Hajer Mkacher, Fadwa ElJack***	**ICH2P14 - OP072** Protection From Hydrogen Embrittlement Using Green Inhibitor on the Welding Joint of Api X65 Pipeline Steel in Dynamic Loading ***Azedine Belalia, Mohammed Hadj Meliani, Hadjer Didouh, Mouna Amara, Rami K.Suleiman, Guy Pluvinage***
10:00 am-10:15 am	**ICH2P14 - OP151** Regeneration Energy Optimisation of Post-Combustion CO_2 Capture (PCC) Process Based on Amine Composition Using Artificial Neural Network (ANN) ***Najamus Sahar Riyaz, Nancy Khalaf AbuZaid, AlAnkaa Al-Harbi, Abdelbaki Benamor***	**ICH2P14 - OP004** Monte Carlo Simulation Applications for Stakeholder Management on Hydrogen Production Projects: Toward Sustainable Development ***Ayman Mashali***	**ICH2P14 - OP043** Advancing Hydrogen Production: High-Resolution Kinetic Analysis of Photocatalytic Water Splitting Using Covalent Organic Framework Catalyst and Ascorbic Acid ***Suhde Makki, Konstantinos E. Kakosimos***
10:15 am-10:30 am	**ICH2P14 – OP120** A Life Cycle Assessment of Hydrogen Production with Catalyst ***Assem Abdurakhmanova, Ibrahim Dincer***	**ICH2P14 - OP052** Assessment of Hydrogen Trading Within Blockchain and Artificial Intelligence: A Review ***Sofya Morozova, Arif Karabuga, Zafer Utlu***	**ICH2P14 – OP140** A Critical Review of Hydrogen (H_2) Flow Assurance in the Presence of Impurities ***Mohammad Azizur Rahman, Ibrahim Hassan, Rashid Hasan, Faisal Khan, Eduardo Gildin, Ahmad Sleiti***

Day 3 | Thursday, December 21, 2023

Poster Number	Poster Presentations 10:30 am-11:00 am Session Chair: **Dr. Burak Yuzer**	Exhibition Hall
ICH2P14 – PP005	Efficiency Hydrogen Production Via Water Photoreduction Over Fenps Elaborated Via Green Way ***Meriem Guouasmi, Amel Boudjema, Chahrazed Benhamidech, Khaldoun Bachari***	
ICH2P14 – PP011	Field Investigation of Green Hydrogen Production Through the Pem Electrolyzer in Ouargla City ***Ahmed Zouhir Kouache, Ahmed Djafour, Khaled Mohammed Said Benzaoui, Madjida Ramdani***	
ICH2P14 – PP028	Recent advances in Green Synthesis of Cu_2O as a Photocatalyst for Conversion of Solar Energy into H_2 ***S. Torres-Arellano, P.J. Sebastian***	
ICH2P14 – PP030	Effect of Scale-Up in Membraneless Microbial Electrolysis Cells on Hydrogen Production ***M. Mejía-López, O. Lastres, J.L. Alemán-Ramirez, L. Verea, P.J. Sebastian***	
ICH2P14 – PP153	Synthesis and Evaluation of Cu-Based Catalytic Materials for CO_2 Hydrogenation to Value-Added Products ***Rim Ismail, Assem Mohamed, Mohamed Ali H. Saad, Abdelbaki Benamor***	
ICH2P14 – PP168	Current and Temperature Distributions in a Planar Solid Oxide Electrolysis Cell In-situ Assessed with Segmented Electrodes ***Kentaro Yokoo, Hironori Nakajima, Kohei Ito***	
ICH2P14 – PP181	Underground Gas Storage Systems: Natural Gas, Hydrogen, And Carbon Sequestration ***Manal Al-Shafi, Yusuf Bicer, Ahmad Abushaikha***	
ICH2P14 – PP055	Forced Convection in Porous Medium Using Triply Periodical Minimum Surfaces: Experimental and Numerical Approach ***M. Ziad Saghir***	

Day 3 | Thursday, December 21, 2023

Parallel Sessions 6

Time	Conference Room – A047	Conference Room – A048	Conference Room – A046
11:00 am-12:30 pm	**Session 6A:** **Bio-Hydrogen-2** Chair: **Dr. Mohammad Alherbawi** Co-Chair: **Dr. Farhat Mahmood**	**Session 6B:** **Hydrogen Storage and Carriers** Chair: **Dr. Majeda Khraisheh** Co-Chair: **Dr. Alessandro Sinopoli**	**Session 6C:** **Electrolyzers** Chair: **Dr. Muhammed Iberia Aydin** Co-Chair: **Dr. Nurettin Sezer**
11:00 am-11:15 am	**ICH2P14 - OP157** Potential Evaluation and Optimization of Exoelectrogenic Activity of Rhodobacter Capsulatus: A Sustainable Strategy for Bioelectricity Production ***Saima Mirza, Junaid Mahmood, Arjumand Shah Bano, Mohammad Morowvat, Mudassar Ali, Obaid ur-Rehman***	**ICH2P14 - OP145** Heat Transfer Optimization of a Metal Hydride Tank Targeted to Improve Hydrogen Storage Performance ***Nadhir Lebaal, Djafar Chabane, Alaeddine Zereg, Nouredine Fenineche***	**ICH2P14 - OP156** An Electrolyser Design for Membraneless Electrolysis by Using 3D Printing ***Muhammed Iberia Aydin, Ibrahim Dincer***
11:15 am-11:30 am	**ICH2P14 – OP135** Predictive Modeling of Biogas and Methane Production from Cow and Chicken Manure Using a Modified Gompertz Model Optimized by Particle Swarm Optimization ***Nadjiba Sophy, Nour Elislam Mougari, Nabil Himrane, Luis Le Moyne***	**ICH2P14 – OP137** Sodium Bicarbonates Production Through Carbon Mineralization for Hydrogen Storage: A Techno-Economic Assessment ***Dina Ewis, Zeyad Moustafa Ghazi, Sabla Y. Alnouri, Abdelbaki Benamor, Muftah H. El-Naas***	**ICH2P14 – OP179** Modeling For Multi-Mechanisms Permeability of Hydrogen Using a Membrane Process ***Hamid Zentou, Mahmoud M. Abdelnaby, Abdullah A. AlZahrani***
11:30 am-11:45 am	**ICH2P14 - OP079** Optimizing Hydrogen Production and Anaerobic Biodegradability in Pharmaceutical Industry Wastewaters Through Photocatalytic Oxidation ***Ayşe Elif Ateş, Burak Yüzer, Adem Yurtsever, Sinan Ates***	**ICH2P14 - OP146** Assessing the Potential and Viability of Renewable Methane and Hydrogen as Sustainable Energy Carriers ***Mohammed Al-Breiki, Yusuf Bicer***	**ICH2P14 - OP033** Degradation Modelling of Water Electrolysers Using Hidden State Estimation and Deep Learning ***Frank Hilden, Pourya Azadi, Stéphane Haag, Giuseppe Cusati, Vanessa Gepert***
11:45 am-12:00 pm	**ICH2P14 – OP189** Biocatalytic Conversion of Lignocellulosic Biomass into Biohydrogen Via Photofermentation Route ***Saima Mirza, Javed Iqbal Qazi, Shulin Chen***	**ICH2P14 – OP184** Flexible Natural Gas Allocation to Blue-Hydrogen Monetised Products: An Agent-Based Modelling Approach ***Noor Yusuf, Ahmed AlNouss, Tareq Al-Ansari***	**ICH2P14 - OP141** Experimental And Numerical Analyses of A Cathode-Supported Monolithic Solid Oxide Electrolysis Cell ***Hironori Nakajima, Yoshihiro Iwanaga, Kohei Ito***
12:00 pm- 12:15 pm	**ICH2P14 – OP196** Mathematical Modeling of A Sustainable Energy System For Restaurant Communities: Waste-To-H2 Conversion, CO2 Mitigation, Clean Fuel Production, And Power Generation ***Syed Muhammad Aun Rizvi, Khurram Kamal, Tahir A.H. Ratlamwala***	**ICH2P14 – OP035** Power-To-Gas Process in the Upgrading of The CO_2 Extracted from the Unprocessed Algerian Natural Gas ***Rafika Boudries, Nourdine Kabouche, Rafik Medjebour, Brahim Laoun, A. Khellaf***	**ICH2P14 – OP065** Solar Hydrogen and Methanol Production with CSP/PV Driven Electrolyser ***Nathalie Monnerie, Andreas Rosenstiel, Christian Sattler***
12:15 pm-12:30 pm	**ICH2P14 - OP092** An Approach in Treating Biomass and Plastic Waste for Production of Hydrogen and Ethanol ***Muhammad Ishaq, Ibrahim Dincer***	**ICH2P14 – OP183** Comparative Thermodynamic Analysis of Two Green Fuel Production and Power Generation Pathways ***Amira Chebbi, Yusuf Bicer***	**ICH2P14 - OP090** An Investigation of Metal Coated 3D-Printed Electrodes for Hydrogen Production ***Muarij Khalil, Ibrahim Dincer***
12:30 pm-02:00 pm **Lunch** **Exhibition Hall**			

Day 3 | Thursday, December 21, 2023

Parallel Sessions 7			
Time	**Conference Room – A047**	**Conference Room – A048**	**Conference Room – A046**
02:00 pm-03:30 pm	**Session 7A:** **Thermodynamic Analysis of Hydrogen Systems** Chair: **Dr. Hadi Genceli** Co-Chair: **Dr. Shoukat Alim Khan**	**Session 7B:** **Fuel Cells and Combustion** Chair: **Dr. Mohd Zamri Che Wanik** Co-Chair: **Dr. Tahir A.H. Ratlamwala**	**Session 7C:** **Photo-Electro-Catalytic Hydrogen Production** Chair: **Dr. Rima Isaifan** Co-Chair: **Dr. Khaled Abedrabboh**
02:00 pm-02:15 pm	**ICH2P14 - OP152** Design, development and investigation of solar-integrated co-electrolysis for methanol production ***Muhammad Sajid Khan, Muhammad Abid, Chen Chen, Juliana Hj Zaini, Tahir Ratlamwala***	**ICH2P14 - OP042** Feasibility Study of a Molten Carbonate Fuel Cell as a CO_2 Separator for Various Industrial Exhaust Emissions ***Arkadiusz Szczęśniak, Aliaksandr Martsinchyk, Olaf Dybinski, Katsiaryna Martsinchyk, Kamil Futyma, Łukasz Szabłowski, Jarosław Milewski, Małgorzata Dembowska***	**ICH2P14 - OP034** Synthesis and Application of Pd/Sr-NPs@TiO_2 for Photocatalytic H_2 Generation from Water Splitting Reactions ***Ejaz Hussain, Khezina Rafiq***
02:15 pm-02:30 pm	**ICH2P14 – OP160** Energy And Exergy Analysis of A Four-Step Copper Chlorine Cycle For Enhanced Efficiency And Performance ***Satyasekhar Bhogilla, Aman Pandoh, Uday Raj Singh***	**ICH2P14 - OP149** Sustainable Proton-Exchange-Membrane Fuel Cell (PEMFC) System Exergoeconomic Analysis ***Rodrigo Raimundo, Carlos Matiolo, Rhayssa Ribas, Lauber Martins, André Mariano, Stephan Och, Vanessa Kava, José Vargas***	**ICH2P14 – OP127** Dye-Sensitized Photocatalytic Hydrogen Production by Sepiolite Clay ***Yigit Osman Akyildiz, Emre Aslan, Mahmut Kus, Imren Hatay Patir, Mustafa Ersoz***
02:30 pm-02:45 pm	**ICH2P14 – OP054** Performance Evaluation of Different Working Fluids In S-ORC Based Hydrogen Production System ***Arif Karabuga, Zafer Utlu, Melik Ziya Yakut***	**ICH2P14 – OP136** 3e Analysis and Multi-Objective Optimization of Solar-Thermal-Assisted Energy System: Supercritical CO_2 Brayton Cycle and Solid Oxide Electrolysis/Fuel Cells ***Zhicong Fang, Zhichao Liu, Shuhao Zhang, Zekun Yang***	**ICH2P14 - OP032** Synthesis of Au–Bao@TiO_2/Cds Catalysts: H_2 Generation from Water Splitting Reactions ***Khezina Rafiq, Ejaz Hussain***
02:45 pm-03:00 pm	**ICH2P14 - OP162** Thermodynamic Evaluation of a Renewable Energy Storage Concept Incorporating a Solid Oxide Electrolyzer and Metal Hydride Compressor ***Uday Raj Singh, Satyasekhar Bhogilla***	**ICH2P14 – OP203** A Review of The Feasibility of Utilising Hydrogen as a Marine Fuel in Australia ***Hongjun Fan, Nagi Abdussamie, Andrew Harris, Peggy Shu-Ling Chen, Irene Penesis***	**ICH2P14 – OP115** Photocatalytic Hydrogen Generation from Seawater Using High-Performance Polymeric Materials ***Noora Al-Subaiei, Ghalya Abdulla, Mohammed Al-Hashimi, Konstantinos E Kakosimos***
03:00 pm-03:15 pm	**ICH2P14 - OP053** Thermodynamic Analysis of PTC-Based Hydrogen Production System ***Arif Karabuga, Zafer Utlu, Hasan Ayarturk***	**ICH2P14 - OP143** Study Of Laminar Burning Speed Correlation' For Ammonia-Hydrogen Fueled Mixture ***Anas Rao, Muhammad Ihsan Shahid, Muhammad Farhan, Yongzheng Liu, Fanhua Ma***	**ICH2P14 - OP021** Efficient and Stable Seawater Electrolysis Over a Binder-Free Nio-Nanosheet Array Bifunctional Catalyst ***Khadijeh Hemmati***
03:15 pm-03:30 pm	**ICH2P14 – OP093** A Unique System for Hydrogen, Methanol, Fresh Water and Electricity Production with Carbon Capturing and Storage ***Mitra Ghannadi, Ibrahim Dincer***	**ICH2P14 – OP194** Proton Exchange Membrane based Fuel Cell Generation System Modeling for Power System Studies ***Mohd Zamri, Che Wanik***	**ICH2P14 – OP121** Piezocatalytic Hydrogen Evolution Activity of Seleno-Chevrel Phases ***Talha Kuru, Emre Aslan, Faruk Ozel, Imren Hatay Patir, Mustafa Ersoz***
03:30 pm-04:00 pm **Coffee Break with Poster Presentations** **Exhibition Hall**			

Day 3 | Thursday, December 21, 2023

Poster Number	Poster Presentations 03:30 pm-04:00 pm Chair: **Dr. Burak Yuzer**	Exhibition Hall
ICH2P14 – PP132	Modeling Of Supercritical Hydrogen Storage System Parameters Using Artificial Intelligence Technique ***A. Abdallah El Hadj, Ait Yahia, Smain Sabour, Mohammed R Zahi, Maamar Laidi, S.Hanini***	
ICH2P14 – PP147	Photo-Electro-Electrolysis System Utilizing TiO_2-Coated Stainless Steel and FTO as Photoelectrodes for Enhanced Dye Removal in Wastewater and Hydrogen Production ***Nadira Salsabila, Ragad F. Alshebli, Burak Yuzer, Yusuf Bicer***	
ICH2P14 – PP169	Dynamic Modelling Approach for Understanding the Influence of Carbon Policies on Electrofuels Utilisation Within the Aviation Sector ***Ridab Khalifa, Yusuf Bicer, Tareq Al-Ansari***	
ICH2P14 – PP185	Multi-Purpose Charging Station for Electric and Hydrogen Vehicles Enabling Sustainable Transportation ***Marawan Hussein, Sara Mohamed, Amira Chebbi, Luluwah Al-Fagih, Tareq Al-Ansari, Yusuf Bicer***	
ICH2P14 – PP068	Hydrogen Sulfide H_2S – for the Service of Humanity! ***Anatolii Startsev***	

Time	Conference Room – A048	Conference Room – A046
04:00 pm-05:00 pm	**Session 8A:** **Other Hydrogen Applications** Chair: **Dr. Dogan Erdemir** Co-Chair: **Dr. Hanadi G. Al-Thani**	**Session 8B:** **Hydrogen Utilization and Production** Chair: **Dr. Huseyin Selcuk** Co-Chair: **Dr. Muhammed Iberia Aydin**
04:00 pm-04:15 pm	**ICH2P14 - OP051** Enhancing Hydrogen Gas Production in Escherichia Coli Through a Crispr-Based Approach ***Salisu Ahmed, Musa Abdullahi, Abubakar Ahmad***	**ICH2P14 – OP182** A Techno-Economic Analysis of Hybrid Solar-Wind Energy Systems with Hydrogen Storage for Residential Communities ***Sara Mohamed, Yusuf Bicer, Luluwah Al-Fagih***
04:15 pm-04:30 pm	**ICH2P14 - OP148** State-Flow Based Energy Management System in Micro-Grid Including Fuel Cell ***Hamid Bentarzi, Abderrahmane Ouadi, Abdelkader Zitouni, Abdelkader Abdelmoumene***	**ICH2P14 – OP138** Design And Performance Analysis of Ammonia-Based Power Generation ***Kazuki Ohira, Rahmat Waluyo, Muhammad Aziz***
04:30 pm-04:45 pm	**ICH2P14 – OP191** Wind Power's Evolution: Unveiling Advances and Challenges in the Quest for Sustainable Energy ***Abdelkader Abdelmoumene, Hamid Bentarzi***	**ICH2P14 – OP071** Investigation of a New Energy System with Recycled Aluminum-Water Hydrogen Production ***Andre Bolt, Ibrahim Dincer, Martin Agelin-Chaab***
04:45 pm-05:00 pm	**ICH2P14 – OP213** An Investigation on the Magnetic Cooling Systems in Electric Vehicle ***Nader Javani, Hadi Genceli***	**ICH2P14 – OP195** Optimizing Green Hydrogen Production in the GCC: A Pilot Study of Capacity Factor Enhancement via Trans-Continental Energy Imports ***Moiz Ali, Yusuf Bicer, Tareq Al-Ansari***
05:00 pm-05:15 pm	**ICH2P14 – OP070** Bio-Inspired Optimization of Hydrogen Production Plants: Harnessing the Pollutants for Enhanced Efficiency of Fuel Cell ***Khaled Abu Alfoul, Anaam Abu Foul***	**ICH2P14 - OP098** Electro-Biomembrane Reactor for Concurrent Hydrogen Production and Desalination ***Ahmet Faruk Kilicaslan, A. Yagmur Goren, Ibrahim Dincer, Ali Khalvati***
05:15 pm-05:30 pm	**ICH2P14 – OP119** Low Price Photo and Thermal Production of Hydrogen Fuel from Hydrogen Sulfide Extracted from Petroleum Natural Gas ***Salah Naman***	**ICH2P14 - OP078** A Community Energy System Designed to Cover the Needs Including Hydrogen ***Moslem Sharifishourabi, Ibrahim Dincer, Atef Mohany***
06:30 pm-09:30 pm **Optional Social Tour**		

Hydrogen Energy Course

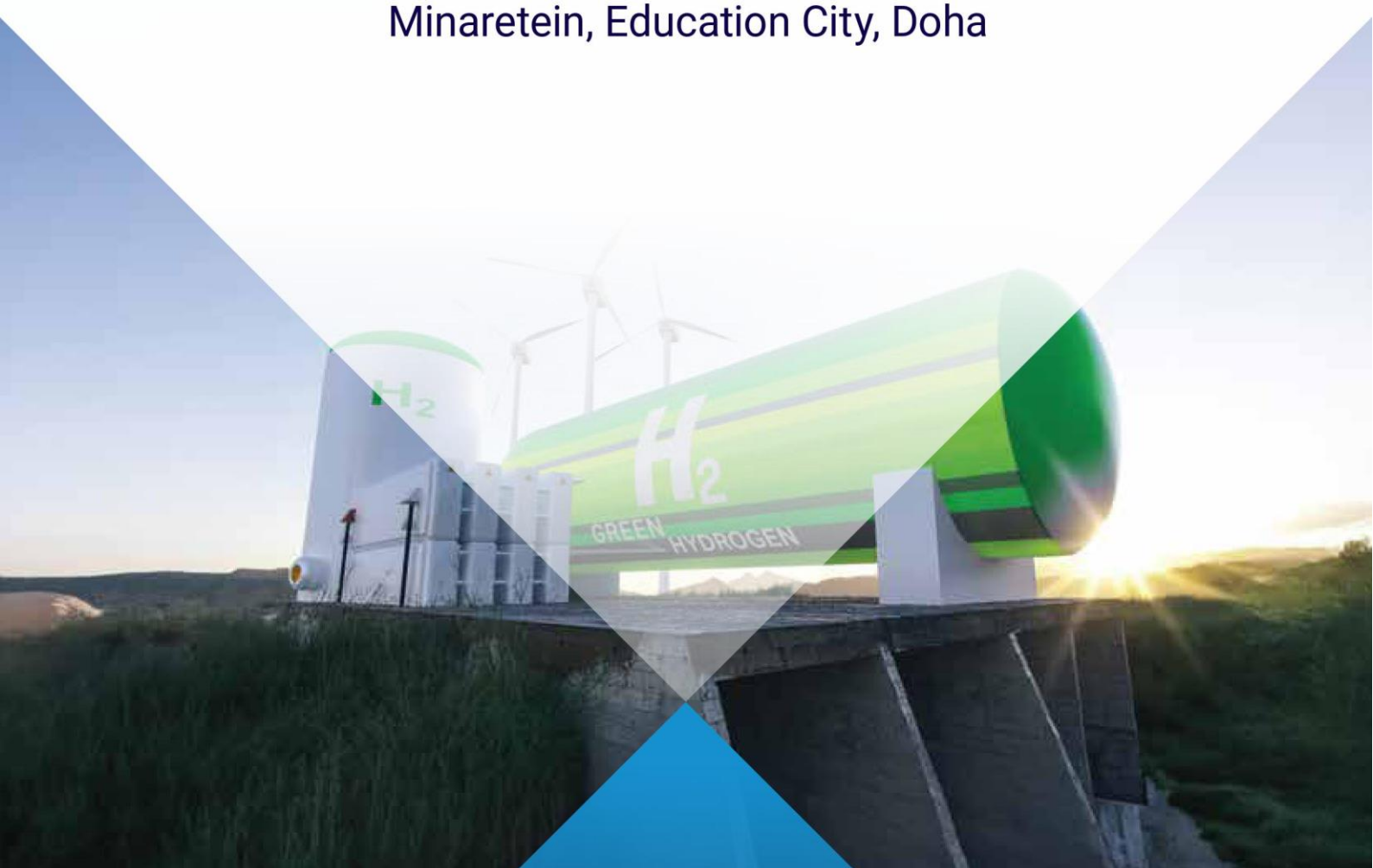
Time	Hydrogen Energy Course (with registration)	Auditorium
09:00 am-09:15 am	Opening Talks	
09:15 am-11:15 am	**Introduction to Hydrogen: H2-101** **Professor Dr. Ibrahim Dincer**, Ontario Tech University, Canada	
11:15 am-11:30 am	Break	
11:30 am-01:30 pm	**Hydrogen Production: Electrolyzes, Methods and Processes** **Professor Dr. Fares Almomani,** Qatar University, Qatar	
1:30 pm-02:00 pm	Lunch Break	
2:00 pm-04:00 pm	**Hydrogen Storage and Transportation** **Dr. Yusuf Bicer,** Hamad Bin Khalifa University, Qatar	
04:00 pm-04:15 pm	Break	
04:15 pm-06:15 pm	**Hydrogen Utilization and Fuel Cells** **Professor Dr. Xianguo Li**, University of Waterloo, Canada	
06:15 pm-06:30 pm	**Certification Ceremony**	

كلية العلوم والهندسة
College of Science & Engineering
جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY

14TH INTERNATIONAL CONFERENCE ON HYDROGEN PRODUCTION (ICH2P-2023)

DECEMBER 19 - 21, 2023

Minaretein, Education City, Doha



14th INTERNATIONAL CONFERENCE ON HYDROGEN PRODUCTION (ICH2P-2023)

December 19 – 21, 2023
Education City, Doha, Qatar

CONFERENCE PROCEEDINGS

EDITORS

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Mohammad Alherbawi
Burak Yuzer

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ABOUT HAMAD BIN KHALIFA UNIVERSITY

Hamad Bin Khalifa University (HBKU), a member of Qatar Foundation for Education, Science, and Community Development (QF), was founded in 2010 to continue fulfilling QF's vision of unlocking human potential.
HBKU is a homegrown research and graduate studies University that acts as a catalyst for positive transformation in Qatar and the region while having a global impact.

Located within Education City, HBKU seeks to provide unparalleled opportunities where inquiry and discovery are integral to teaching and learning at all levels utilizing a multidisciplinary approach across all focus areas.

HBKU is committed to actively contribute to achieving the Qatar National Vision 2030 by building and cultivating human capacity through an enriching academic experience and an innovative research ecosystem. Through applying creativity to knowledge, students will have the opportunity to discover innovative solutions that are locally relevant and have a global impact.

At Hamad Bin Khalifa University – our students, faculty, staff, partners, and leadership – all share a common belief in the power of higher education and research to make a positive impact in the development of nations.

FOREWORDS

Dean's Welcoming Message

On behalf of the College of Science and Engineering (CSE) at Hamad Bin Khalifa University, it is our honor to host and organize this prestigious international event, the 14th International Conference on Hydrogen Production (ICH2P-2023). I would like to extend my warmest greetings to all the attendees of this promising event.

The College of Science and Engineering aims to be a world-class multidisciplinary college with significant positive impact on the region and the world, in the fields of science, engineering, and technology. One of our key divisions is the Division of Sustainable Development with its mission of educating future leaders on Sustainable Energy and Sustainable Environment and all associated areas.

We look forward to contributing to the high-quality research results that will be presented during the symposium, which will help develop new policies and scientific progress towards achieving sustainable development, and be of great value to positioning our college in the midst of these extremely important fields of hydrogen research.

We look forward to welcoming you.

Dr. Mounir Hamdi
Dean of the College of Science and Engineering
Hamad Bin Khalifa University

FOREWORDS

Co-Chair's Welcoming Message

As Co-Chair of the Organizing Committee for the International Conference on Hydrogen Production (ICH2P-2023), I am honored to welcome you to this esteemed gathering held at Hamad Bin Khalifa University, Education City, in Qatar from December 19-21, 2023. Your presence here signifies a shared commitment to addressing the challenges of our time through innovative solutions in hydrogen production, storage, transportation, delivery, and utilization.

The scientific part of ICH2P-2023 will include talks by keynote speakers, invited speakers, and industry experts, as well as oral and poster presentations from academic participants. Conference proceedings will be published on the website after reviewing the submitted manuscripts. High-quality papers will be considered, in expanded form, for possible publication in specific reputable international journals mentioned on the conference website.

Throughout the conference days, we invite you to immerse yourself in the diverse discussions, presentations, and collaborative opportunities that this conference offers. The insights and knowledge shared here have the power to shape the future of sustainable energy.

We extend our deepest appreciation to the speakers, sponsors, and the dedicated organizing committee for their tireless efforts in making this event possible. Together, let us embark on a journey of discovery, collaboration, and progress towards a more sustainable and hydrogen-powered world.

Thank you for being part of this transformative experience.

Yusuf Bicer
Conference Co-Chair
Associate Professor, Division of Sustainable Development
College of Science and Engineering
Hamad Bin Khalifa University

FOREWORDS

Co-Chair's Welcoming Message

On behalf of the Division of Sustainable Development, it is my distinct pleasure to welcome you to the International Conference on Hydrogen Production (ICH2P-2023) at Hamad Bin Khalifa University. This gathering is a testament to our collective commitment to advancing sustainable solutions, and your presence amplifies the impact we can make together.

Hydrogen, as a clean and versatile energy source, is at the forefront of our shared vision for a more sustainable future. We encourage you to actively participate in the sessions, engage in discussions, and forge connections that transcend borders and disciplines. The interdisciplinary collaboration fostered during this conference has the potential to drive innovation and pave the way for a greener world.

We also plan to include a social program covering a welcome reception, lunches, coffee breaks, a gala dinner, and social tours in Doha. You will have the opportunity to experience and observe the distinctive Qatari culture, and the hospitality and beauty of Doha.

A heartfelt thank you to the organizers, speakers, and sponsors for their dedication to making this event a success. Together, let us explore the frontiers of hydrogen production and contribute to building a more sustainable and resilient world.

We endeavor to ensure that ICH2P-2023 will be a valuable, impactful, and enjoyable event.

Dr. Tareq Al-Ansari
Conference Co-Chair
Associate Professor, Head of the Division of Sustainable Development
College of Science and Engineering
Hamad Bin Khalifa University

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AN INTEGRATED SOLAR-DRIVEN CHLOR-ALKALI SYSTEM FOR HYDROGEN AND CHLORINE PRODUCTION

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ABSTRACT
This paper deals with a review of the chlor-alkali process, an industrial application with significant promise for hydrogen production. In this process, the 2.6 MWh of power required for the operation of the system is met by an ingenious approach using a photovoltaic-based energy system. The research includes a comprehensive simulation of a chlor-alkali production system with the operating temperature set to 88°C using the Aspen Plus. The results demonstrate the remarkable potential of this system with a hydrogen production rate of 82.5 kg/h.

Keywords: Hydrogen, hydrogen production, chlor-alkali process, photovoltaic-based energy system.

INTRODUCTION
The chlor-alkali process, primarily responsible for the production of chlorine, sodium hydroxide (commonly referred to as caustic soda), and hydrogen, exemplifies an efficient and environmentally sustainable industrial procedure. This method, which boasts numerous advantages for hydrogen generation, operates as an electrolysis-based process involving anode and cathode reactions, ultimately yielding chlorine (Cl_2), sodium hydroxide (NaOH), and hydrogen gas (H_2). Notably, the generation of hydrogen stands as a valuable byproduct in conjunction with the production of hydrogen, chlorine, and sodium hydroxide. A plethora of environmentally friendly and highly efficient energy systems may be selected as the energy source for such processes. In a study conducted by Wang et al., they fulfilled the energy requirements of the system through a combination of wind, solar, and fuel cell technologies [3]. Pravin et al., also proposed a similar hybrid system in their study. A review of the existing literature reveals that the endeavor to meet the power needs commonly involves the utilization of multiple energy sources [2]. In this study, however, solar energy, a singular source, is employed. The power requirements of the system are satisfied by harnessing solar energy, which stands as a more abundant resource compared to other alternatives. The strategic placement of photovoltaic systems, essential for enhancing sustainability in energy production, is instrumental in achieving significant advantages in terms of energy efficiency. This endeavor commences with the harnessing of solar energy through photovoltaic panels, ensuring the efficient capture of solar radiation. Subsequently, this solar energy undergoes conversion into electrical energy, thereby serving as the primary energy source for chlor-alkali electrolysis. The envisioned end products in this system encompass chlorine gas, sodium hydroxide, and hydrogen gas.

SYSTEM AND ASSESSMENT
The schematic representation of the proposed system is shown in Figure 1. In this system, sodium chloride (NaCl) and hydrochloric acid (HCl) solutions are selected for the product feed. The purified brine is acidified with HCl before entering the electrolysis process. As shown in Figure 1, a photovoltaic system was selected to fulfil the energy requirement of the system. In this solar energy utilisation system supported by solar panels, heat transfer is provided from the segment designated as PV through the S6 line. This method is necessary to provide the power required for the operation of chlor-alkali production plants. The product is then fed into the Stoichiometric reactor, which acts as an anode. In this reactor, chloride ions (Cl^-) are transformed into chlorine gas (Cl_2) and reactions for the production of water (H_2O) and oxygen (O_2) are defined. Subsequently, Cl_2 output takes place in the Gibbs reactor, the so-called anolyte, where the production of Cl_2 gas takes place. After this process, other products enter the membrane as separators, allowing sodium ions (Na^+) to pass through the membrane. Na+ ions leaving the membrane acting as a separator, where the separation of sodium chloride (NaCl) and Na+ ions takes place, enter the Stoichiometric reactor acting as a cathode. Here the H_2O component is separated into hydrogen gas (H_2) and hydroxide ions (OH^-). Then, OH^- ions are separated in the membrane acting as a separator and cyclically return to the system and enter the Stoichiometric reactor acting as an anode. This process step is important for the system. Following the feedback process, the remaining products are separated by Flash, which undergoes a Split process, resulting in the extraction of H_2. Following the extraction of H_2, sodium hydroxide (NaOH) is obtained by a Split procedure. The remaining products are then re-introduced into the system. During the re-feed process, water is introduced into the Mixer and H_2 production is restarted by reintroducing all products into the cathode. In this study establishes an optimal applied current density within the chlor-alkali plant, falling within the defined range of $6x10^5$ to $7x10^5$ A/m^2. Concurrently, the voltage parameters

are ascertained to be within the range of 2-3 V. A comprehensive review of pertinent literature, encompassing both experimental and numerical inquiries, reveals that the identified current density and voltage values align satisfactorily with the stipulated requirements for the system's power demand.

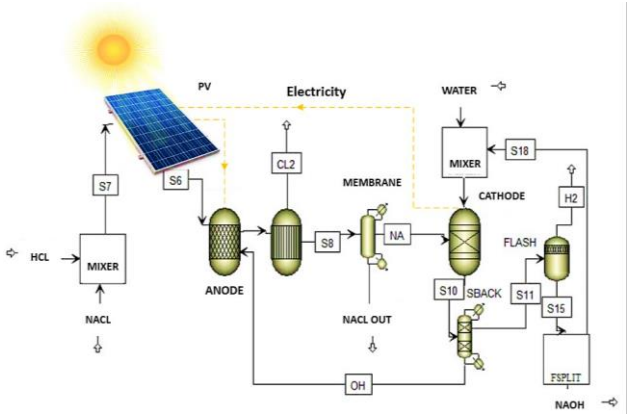

Figure 1. Schematic representation of the system.

RESULTS AND DISCUSSION

This section presents the results obtained in this study. The quantities of HCl and NaCl components introduced into the system were set at 0.0272 kg/h and 111.612 kg/h, respectively, based on the data acquired through the literature review. The operating temperature of 88 °C was determined using the energy supply line from the PV section, which is the system's energy source. This temperature was chosen as it was found to be suitable for the chlor-alkali production industry according to the results of the literature review. As depicted in Figure 2, the Cl_2 gas produced from the Gibbs reactor, functioning as the anolyte, amounted to 64.97 kg/h. Furthermore, the production of Na ions in the membrane section was measured at 43.90 kg/h. When considering the products obtained in this section, a total of 780 kg/h of water and other products were generated. In accordance with the cathode process, hydrogen production is achieved through the introduction of Na into the reactor and the re-entry of all products from the feedback. Figure 2. illustrates the production of 82.5 kg/h of hydrogen. Additionally, another product of the system, the NaOH component, was obtained at a rate of 47.56 kg/h.

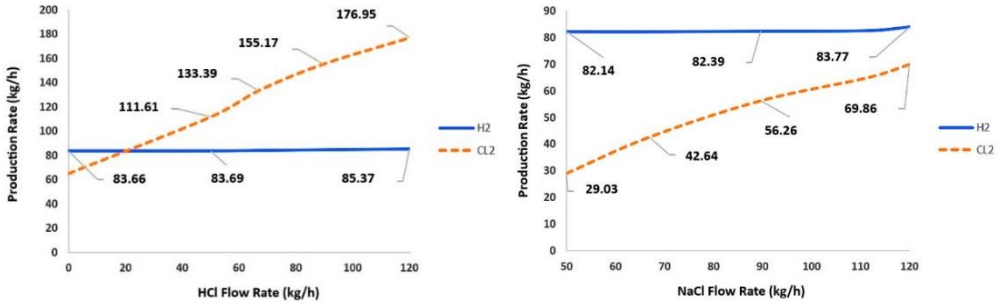

Figure 2. Graphical representation of a) hydrogen b) chloride products produced by NaCl and HCl feeding.

CONCLUSIONS

In this study, hydrogen and chlorine productions through an integrated chlor-alkali system are investigated as a clean and reliable energy production method where the photovoltaic panel systems in an innovative approach for energy production were combined. For the efficient operation of the system, the temperature value was determined as 88°C with the panels integrated into the system. With the feedbacks made, the system has been made to work more efficiently. When we look at the products obtained as a result, the hydrogen yield was recorded as 82.5 kg/h.

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