



14th International Conference on Sustainable Energy & Environmental Protection
SEEP2022
12th – 15th of September 2022
Hamilton Conference Centre
Brunel University London, Kingston Lane, Uxbridge, UB8 3PH, UK

Day 1- 12th September 2022

Newton South Room

08:00 – 09:15

Registration

Opening Session

Conference Chair: Prof. Abdul Ghani Olabi
Prof. Hussam Jouhara
Prof. Abdulnaser Sayma

09:30– 09:45

Welcome talk by

Professor Andrew Jones, Vice-Chancellor and President of Brunel University London

Introduction to SEEP

Professor Abdul Ghani Olabi, Director of Sustainable Energy and Power Systems Research Centre, University of Sharjah

09:45 – 10.15

Keynote by

Prof. Soteris Kalogirou

“Renewable Energy Systems: Current Status in the World and Prospects

Dean – Professor at
Cyprus University of Technology
Editor in Chief of Renewable Energy, Elsevier

10:15 – 10:45

Keynote by

Prof. John Dear

“Impact Modelling and Repair of Composite Structures for the Green Energy Future”

Professor of Mechanical Engineering at
Imperial College

10:45 – 11:15

Keynote by

Prof. Ibrahim Dincer

Professor at
Ontario Tech University



	<i>"Importance of research, innovation and commercialization in integrated sustainable energy technologies"</i>		President of the Hydrogen Technologies Association
11:15 -11:45	Keynote by Prof. Hussam Jouhara <i>"Advances in Heat Exchangers Designs for Waste Heat Recovery Systems - Case Study: ETEKINA"</i>		Professor at Brunel University London Editor in Chief of the International Journal of Thermofluids
11:45- 12:00	Break		
Newton South Room			Cavendish Room
Session A1 "Solar Energy" Chairperson: Prof. Abdalnaser Sayma			Session A2 "Fuel Cell" Chairperson: Prof. Abdul Ghani Olabi
12:00 – 12:15	Xian-Peng Chen	Efficiency evaluation of solar power generation based on stochastic data: evidence from power plants in China	12:00 – 12:15 Zeshan Sheikh Assessment of algae-assisted microbial fuel cell performance for wastewater treatment and energy recovery using two different wastewaters as catholyte
12:15 – 12: 30	Zheng Wang	The deployment priority study of wind and solar power in China at a fine scale	12:15 – 12: 30 Paweena Prapainainar Calcium hydroxy phosphate-functionalized graphene oxide/Nafion composite membrane for direct methanol fuel cell
12:30– 12:45	Abdul Hai Alami	An Investigation of Copper Mesh as a potential Photoanode Material for Dye-Sensitized Solar Cells Applications	12:30– 12:45 Chaiwat Prapainainar Microcrystalline cellulose/Nafion composite membrane to improve direct glycerol fuel cell performance



12:45 – 13:00	Shafiqur Rehman	Technical Performance Analysis of Glazed and Evacuated Types Solar Water Heaters	12:45 – 13:00	G M Cabello González	Effect of operating condition in water liquid distribution in a hydrogen PEM fuel cell
13:00 – 13:15	Mehdi Neshat	Prediction of Long-Term Solar Radiation using State-of-the-art Machine Learning Techniques: A Case Study and Comparison	13:00 – 13:15	M.A. Abdelkareem	Ni-MOF prepared by ball mill as an effective anode of direct urea fuel cell
13:15 – 13:30	Ammar Alkhalidi	Experimental Investigation Thermal and Exergy Efficiency of Photovoltaic/Thermal System	13:15 – 13:30	Enas Sayed	Effect of cobalt crystalline structure on its activity towards urea oxidation in direct urea fuel cell
13:30 - 14:00	Lunch Break				
Session B1 “Green Hydrogen” Newton Room South Chairperson: Prof. Blaž Luin			Session B2 “Renewable Energy & Environmental Developments” Cavendish Room Chairperson Prof. Christoph Pfeifer		
14:00 – 14:15	Yu Qiu	Enhanced Ammonia Decomposition over $\text{Ni}_x\text{Co}_{10-x}/\text{MgAl}_2\text{O}_4\text{-LDH}$ to Enable Mid-temperature Hydrogen production	14:00 – 14:15	Bo Bai	The environmental and economic analysis of different load shaving strategies under high renewable penetration situation



14:15 – 14:30	Mohammed Hussien	Bioelectrochemical routes for boosting the hydrogen recovery during swine manure treatment in dark fermenter - microbial electrolysis cell coupled system
14:30 – 14:45	Sang-Chul Jung	Green hydrogen production from liquid ammonia by plasma cracking in liquid-phase on acid catalysts
14:45 – 15:00	A Cernat	Aspects of an experimental study of hydrogen use at automotive diesel engine
15:00 – 15:15	Suwimol Wongsakulphasatch	Integrated reforming processes for dual production of hydrogen and synthetic gas
15:15 – 15:30	Fares Almomani	Simulation-based techno-economic analysis of onshore hydrogen production from boil-off gas via natural gas steam reforming process

14:15 – 14:30	Mikiale Gebreslase Gebremariam	Probing Environmental Sustainability via Brownfield Remediation: A Framework to Manage Brownfields in Ethiopia Lesson to Africa
14:30 – 14:45	Muhammad Adil Abbasi	In Situ grown pseudocapacitive Fe MOF-MXene composite electrodes for robust supercapacitor
14:45 – 15:00	Muhammad Tawalbeh	Novel Chitosan Based Composite Membranes for High Temperature Fuel Cells Applications
15:00 – 15:15	César Nieto-Londoño	Use of Analytical Hierarchy Process Methodology for Selecting Waste Heat Recovering Alternatives Through an Energy, Economic, and Environmental (3E) Analysis in the Cement Industry
15:15 – 15:30	Carlos E Gómez-Camacho	An environmental perspective on natural gas transport options: pipelines vs Liquefied Natural Gas (LNG)



15:30 – 16:00		Break				
Session C1 “Waste Water Treatment” Newton Room South Chairperson: Dr Rafat Al-Afif			Session C2 “Renewable Energy Technologies” Cavendish Room Chairperson Prof. Christoph Pfeifer			
16:00 – 16:15	P. Mullai	Experiments on performance and residence time distribution of an anaerobic sludge blanket filter in treating industrial textile wastewater	16:00 – 16:15	Abdul Hai Alami	Recent Progress of Machine Learning Algorithms in Battery Energy Storage, Compressed Air Energy Storage and Pumped Hydro Storage	
16:15 – 16:30	Nabila Shehata	Nanocomposite membrane of poly (vinylidene fluoride) doped with Ni:Co:Al layered double hydroxide, for catalyst for methanol electrooxidation and water remediation	16:15 – 16:30	Ali Akhabbaz	The hydrodynamic responses effect of semi-submersible floating platform on aerodynamic behaviour of wind turbine	
16:30 – 16:45	Paritta Prayoonyong	Production of Coagulant from Spent Acid and Sludge for Water Treatment in Industries	16:30 – 16:45	Yebin Lee	A New Approach to apply the Time-varying AC Power Flow Analysis to Power Grids with High Wind Power Penetrations	
16:45 – 17:00	Markus Tamang	Investigation of chitosan crosslinked tripolyphosphate as an adsorbent for the	16:45 – 17:00	Basab Chakraborty	Understanding the electricity demand variability for designing demand response and	



		treatment of real coking wastewater			energy efficiency strategies using smart meter data
17:00 – 17:15	Rina Heu	Assessment of Ground Water Quality for Water Supply at Tonle Sap Lake Floodplain Area of Cambodia	17:00 – 17:15	Minju Lee	An Enhanced Estimation Method of Wind Power Curtailments based on a Short-term Wind Power Forecasting Model using the R-LSTM
17:15 – 17:30	Sung-Gwan Park	Eco-friendly dye removal using seawater pre-treated calcium-rich biochar derived from obstinate food waste	17:15 – 17:30	Tamer M. M. Abdellatif	New and promising technologies for obtaining sustainable aviation fuels
			17:30 – 17:45	Danijela Urbancl	Air pollution analysis in the area of the Republic of Slovenia
			17:45 – 18:00	Conghui Peng	The role of fracture roughness anisotropy on thermal breakthrough in geothermal doublet systems
Closing Day 1 @ Award Presentation of Best Paper					



Day 2-13th September 2022		
Newton South Room		
Chairperson. Prof. Hussam Jouhara		
09:00 - 09:30	Keynote by Professor Christos N. Markides <i>“Next-generation hybrid solar technologies and systems: Challenges and opportunities</i>	Professor, Imperial College London
09:30 – 10:00	Keynote by Mr. Charles Clarke <i>“Sustainability challenges and opportunities in aviation</i>	CEO Those Engineers Ltd
10:00 – 10:30	Keynote by Prof. Prof. Jurgita Malinauskaite <i>“The Green Energy Transition: EU regulatory frameworks and policies”</i>	Professor, Brunel University London
10:30 – 11:00	Keynote by Prof. Antanas Juostas & Egle Jotautiene <i>“Innovative straw chopper technologies for combine harvesters</i>	Institute of Agricultural Engineering and Safety of Vytautas Magnus University
11:00 – 11:15	Break	

Session D1: Bio-Energy Newton Room South Chairperson. Dr. Silvia Tedesco		
11:15 – 11:30	Rafat AlAfif	Evaluation of biochar and hydrocar energy potential derived from olive mills waste: The case of Montenegro
11:30 – 11:45	Stephen Majebi	Current policy framework and future directions for micro-CHP using biofuels and hydrogen
11:45 – 12:00	Lorenzo Bartolucci	Fractional condensation of spent coffee grounds fast pyrolysis volatiles: characterisation and energy analysis of the bio-oil condensates towards high valuable biofuels and chemicals
12:00 – 12:15	Letitia Petrescu	Biodiesel production using various methanol sources: investigation

Session D2 : “Renewable Energy & Carbon Capture Research” Cavendish Room Chairperson. Aditya Satria Ramadhan		
11:15 – 11:30	Abdul Hai Alami	Development of a Biological Cell Photovoltaic (BPV) for energy production with simultaneous CO ₂ capture using Nannochloropsis Oculata microalgae and metal substrates
11:30 – 11:45	Ema Amalia Ulfa & Leni Maria Anjelina	Involving Citizens’ for Power Generation on Public Area and its Advantages
11:45 – 12:00	Dinca Cristian	Influence of the membrane characteristics on CO ₂ post-combustion performances
12:00 – 12:15	Federico Ferrari	Study on carbon dioxide emissions of an Italian intermodal plant and



		based on process modelling and simulation tools			possible reduction scenarios
12:15 – 12:30	Paritta Prayoonyong	Simulation Study of Biodiesel Production from Low and High Free Fatter Acid by Reactive Distillation Column	12:15 – 12:30	Linwei Ma	Analysis of dynamic changes of carbon emissions in China's iron and steel sector 1978-2020: A LMDI decomposition analysis from economy-material-energy-emission nexus perspective
12:30 – 12:45	Carlos E Gomez-Camacho	From Refuse-derived fuel (RDF) to NH3: a key pathway for the sustainability and security of the food production chain	12:30 – 12:45	M. Majidi Nezhad	Development of long-term ground-level air pollution analysis of NO2, SO2, O3, PM2.5 AND PM10 variations: at Rome metropolitan area case study
12:45 – 13:00	Amarnath Krishnamoorthy	Ultrasonication pre-treatment techniques on microalgae chlorella vulgaris & nannochloropsis oculata for lipid extraction in biodiesel feedstock production	12:45 – 13:00	Shafiqur Rehman	Economic Performance of Glazed and Evacuated Tube Types Solar Water Heaters
13:00 – 14:00	Lunch Break				



Session E1: Materials & Recycling Newton Room South Chairperson. Dr. Mohammad Ramadan		
14:00 – 14:15	Simona Rada	Structure and mechanical properties of cement-based materials with recycled powder from construction and demolition wastes
14:15 – 14:30	Di Han	Investigation of Recycled Materials for Radiative Cooling under Tropical Climate
14:30 – 14:45	Erik Christopher Hallsworth	An analysis of alternative bio-based materials for the manufacture of a T-Shirt
14:45 – 15:00	Tasnim Eisa	Tailored Tungsten Melamine Foam Cathode for Enhanced Hydrogen Evolution in Microbial Electrolysis Cells
15:00 – 15:15	Maryam Ebrahimzadeh	An industrial investigation of the effect of purge gas recycling from flare gas to a methanol synthesis reactor on increasing

Session E2: Bio-Energy Cavendish Room Chairperson. Prof Rytis Skominas		
14:00 – 14:15	Fares Almomani	Sustainable And Eco-Friendly Algae-Based Produced Water Treatment
14:15 – 14:30	Danijela Urbancl	Optimal thermal treatment of animal breeding wastes for efficient biofuel production
14:30 – 14:45	Callum Russell	Switchable Solvent for Lipid Extraction of Chlorella vulgaris
14:45 – 15:00	Chaeyoung Rhee	Towards the self-sustainable waste treatment from tobacco manufacturing: optimisation of biogas production from tobacco processing residues
15:00 – 15:15	Tamer M M Abdellatief	Conceptual modelling of a new way to produce sustainable aviation fuels from widely



		methanol production and catalyst deactivation			available lignocellulosic biomass
15:15 – 15:30	Muhammad Tawalbeh	Biodegradable Membranes for PEM Fuel Cells Applications	15:15 – 15:30	Mohammad Ramadan	An overview on the current state of energy in Lebanon
15:30 - 16:00	Break				
Session F1: Green & Smart Energy Newton Room South Chairperson. Prof. Abdul Hai Al-Alami			Session F2: Modelling & Simulation Cavendish Room Chairperson. César Nieto-Londoño		
16:00 – 16:15	Nitchakul Hongloi	Development of a green solvent for green diesel production	16:00 – 16:15	Eun Sol Go	A computational analysis of the in-situ desulfurization for the oxy-CFB process
16:15 – 16:30	Walailak nuinoi	Palmitic acid deoxygenation over Ni-based catalyst under hydrogen donor solvents	16:15 – 16:30	Zak Hawthorne	An evaluation of turbulence models for use in three-dimensional Computational Fluid Dynamics analysis of Wells turbines in oscillating water column flow conditions
16:30 – 16:45	Christian Mikovits	Combined simulation of electricity and crop outputs of AgriVoltaic Systems	16:30 – 16:45	Omar Aqel	Blended CO2 turbines: opportunities and challenges
16:45 – 17:00	Amani Al-Othman	Emerging technologies and prognostic studies for fuel cells and direct hydrocarbon fuel cells	16:45 – 17:00	Seung Gu Shin	Computational fluid dynamics (CFD) analysis of horizontal reactor for solid-state digestion



17:00 – 17:15	Mardi Meas	Monitoring of Pesticide Residues in Tonle Sap Lake, Cambodia	17:00 – 17:15	M. Majidi Nezhad	Trends in renewable energy assessing, modelling and forecasting from online platforms to digital twins approaches
17:15 – 17:30	Dimitrios Rakopoulos	Assessment of smart grid operation under emergency situations	17:15 – 17:30	Issa Zaiter	Current status of energy supply and demand in UAE's industrial sector
17:30 – 17:45	Soumaya Grira	On the potential of microalgae to produce Biofuel	17:30 – 17:45	Muhammad Tawalbeh	Optimization techniques for electrochemical devices for energy applications
17:45 – 18:00	Abdul Hai Alami	The Role of Ionic Liquids and Perovskite Structures on the Impedance of Dye-Sensitized Solar Cells	17:45 – 18:00	Amani Al-Othman	Proton Conductivity studies on Covalent organic frameworks (COFs) for High Temperature Fuel Cells Applications
Closing Day 2 @ Award Presentation of Best Paper					
19:00 – 22:00 Conference Dinner Newton Room					



Day 3-14th September 2022		
Newton Room South		
Symposium on Energy and Water Efficiency in Industrial Processes		
Session S1		
Chairperson: Prof. Luca Montorsi		
09:00 – 9:30	Keynote by Prof. Alojz Buhvald, <i>“Experience and potential in the field of efficient use of energy and reduction of the impact of industrial processes on the environment in the steel industry”</i>	Executive Director of Production at SIJ Metal Ravne
9:30 – 9:45	Boris Susic	Transformation of national energy and climate goals into real-life implementation programme at the company level - case study Slovenia
9:45 – 10:00	Matteo Venturelli	Combined numerical approach for the evaluation of the energy efficiency and economic investment of building external insulation technologies
10:00 – 10:15	Damiana Chinese	Costs and potentials of energy self-sufficiency in the milk processing industry
10:15 – 10:30	Robertas Poskas	Experimental investigation of water vapor condensation in different rows of the heat exchanger model
10:30 – 10:45	Break	



Session S2		
Chairperson: Prof. Luca Montorsi		
10:45 – 11:15	Keynote by Professor Renata Krzyzyska “ <i>Current energy problems related to rapid changes in the energy mix in Europe – environmental aspects</i> ”	Prof. at Wroclaw University of Technology
11:15 – 11:30	Fouad Al Mansour	Carbon Footprint of Vegetable Oils Produced On Family Farms
11:30 – 11:45	Blaž Luin	Estimating ship energy consumption from AIS data
11:45 – 12:00	Matteo Venturelli	Unsteady CFD analysis for the fouling prediction in heat exchangers
12:00 – 12:15	Barbara Dutka	Slags and ashes generated in the process of incineration of municipal waste as one of the cogs of the circular economy
12:15 – 12:30	Alina Żabnieńska-Góra	Analysis of the power output of a TEG module as a function of p and n leg dimensions in COMSOL
12:30 – 12:45	Qusay Doraghi	Computational Investigation of Thermo-Piezo Electric Generator
12:45 – 13:00	Muhammad Ahmad	A Novel Indirect Evaporative Cooler for Net Zero in Air Conditioning Sector



13:00 – 14:00	Lunch Break	
Session S3 Chairperson: Dr. Julien Porré		
14:00 – 14:30	Keynote by Prof. Christoph Pfeifer <i>“Developments on Bio-Energy”</i>	Prof. at University of Natural Resources and Life Sciences
14:30 – 14:45	Valentin Guichet	Modelling of two-phase heat transfer in a three-leg multi-channel heat pipe
14:45 – 15:00	Vassilis Stathopoulos	Encapsulated Phase Change Materials in clays and ceramics: properties and features
15:00 - 15:15	Abdul Hai Alami	Pneumatic propulsion for maritime transportation
15:15 – 15:30	Sulaiman Almahmoud	Experimental study and 2D FEA thermal modelling of a finned heat sink for a TDS conductivity probe in boilers
15:30 – 16:00	Break	
Session S4 Chairperson: Dr. Heba Ghazal		
16:00 – 16:30	Keynote by Prof. Mohammad Ali Abdelkareem <i>“Progress in green hydrogen production”</i>	Prof. at University of Sharjah



16:30 – 16:45	Magdi Rashad	Experimental analysis of the performance of a heat pipe PV/T system under hot climate conditions
16:45 – 17:00	O. Miseckaite & R Baublys	Runoff regime response due climate change in Lithuania
17:00 – 17:15	Mengmeng Guo	Efficiency assessment of photovoltaic poverty alleviation project in China
17:15 – 17:30	Richard Brooks	An Investigation Into Barely Visible Impact Damage (BVID) and Internal Delamination Damage Formed During Impact of CFRPs
17:30 - 17.45	Dimitrios Iatrou	Development of a 3D-printed photocatalytic reactor for industrial water treatment
17:45 – 18:00	Michalis K. Arfanis	3D-printed flat membranes modified by composite SiO ₂ -TiO ₂ photocatalysts
Closing Day 3 @ Award Presentation of Best Paper		



Day 4 -15th September 2022					
Newton Room South					
Keynote Session Chairperson: Prof. Vassilis Stathopoulos					
09:00 – 09:30	Keynote by Dr. Silvia Tedesco <i>“An assessment of paper sludge valorisation to energy and a water substitute in concrete via anaerobic digestion”</i>		Manchester Metropolitan University		
09:30 – 10:00	Keynote by Prof. Luca Montorsi <i>“The Role of Numerical Simulation into Energy Intensive Industries”</i>		Prof. at University of Modena and Reggio Emilia		
10:00 – 10:30	Keynote by Prof. Abdul Hai Alami <i>“Can compressed air energy storage (CAES) compete with battery storage? Challenges and opportunities</i>		Prof. at University of Sharjah		
10:30 – 10:45	Break				
Newton Room South			Cavendish Room		
Session G1 “Renewable Energy Developments” Chairperson Dr Mohammad Ramadan			Session G2 “Renewable Energy & Environmental Issues” Chairperson Dr. Fouad Al-Mansour		
10:45 - 11:00	Hüsamettin Alperen Alabaş	The Effects of The Oxygen Enrichment on The Mini Gas Turbine Engine	10:45 - 11:00	Irfan Khawar	Estimating Air-skin, Air-fat and Air-lungs Partition Coefficients of Nonpolar Complex Analytes using Comprehensive Two-dimensional Gas Chromatography (GC × GC)



11:00 – 11:15	Chee Meng Pang	An investigations of wake interactions of multiple turbines using a modified BEM-AD model in RANS CFD
11:15 – 11:30	Omar Aboelazayem	Thermodynamics of one-pot glucose ethanolysis into ethyl levulinate: Determination of process heat profile and enthalpy change
11:30 – 11:45	Xue Li	Brazilian splitting characteristics and damage of granite under liquid nitrogen circulating cooling
11:45 – 12:00	Ammar Alkhalidi	The Performance of Shallow GSHP in Buildings for heating and cooling: a case study in Jordan
12:00 – 12:15	-	-

11:00 – 11:15	Qui Ren See	Noise Modelling of a Tidal Current Turbine using LES and FW-H Acoustic Analogy
11:15 – 11:30	Fabrizia Devito	Business-models and Advanced Additive Manufacturing strategies for Energy Technology
11:30 – 11:45	Michal Šafář	Effect of Co-Incineration of Plastics with Softwood on Indoor Air Quality
11:45 – 12:00	Monpilai Narasingha	Emulsification of Water in Fuel Oil Emulsion by Phase Inversion Temperature
12:00 – 12:15	Mariateresa Caggiano	Readiness to sustainability via Digital Transition in Energy manufacturing companies: a universal approach

12:15 - 12:30	Break	
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Poster Session Newton Room South 12:30 – 13:00	
Mona Albatarni	Intensifying cryogenic processes with reduced efforts while extracting valuable insights
Fares Almomani	Bioconversion of petroleum toxic waste to high added value chemical: A process integration system
Qusay Doraghi	Computational analysis of thermoelectric modules based on melt-mixed polypropylene composites
Alina Żabnieńska-Góra	Computational investigation of thermo-piezo electric generator
Nina Kosińska	Hydrothermal carbonization as a potential method of low - thermal utilization of sewage sludge towards energy product applications - a review
13:00	Best Presentation Award of Day 4 Conference Closing Session