13th International Conference on Sustainable Energy & Environmental Protection
SEEP2021

Virtual Venue: University of Natural Resources and Life Science, Vienna (BOKU)
13th – 16th of September 2021

Day-1 13th of September 2021

Opening Session

Chairperson: Prof. Christoph Pfeifer (BOKU)

08:45 – 09:00	**Welcome Talk by:** Rector Univ.Prof. Hubert Hasenauer, *University of Natural Resources and Life Science, Vienna*	
09:00 – 09:35	**Keynote** *By* Prof. Soteris Kalogirou *"Renewable energy developments"*	Editor in Chief of Renewable Energy, Elsevier
09:35 – 10:10	**Keynote** *by* Prof. Sabine Fuss *"The role of carbon dioxide removal for ambitious climate goals"*	Professor of Sustainable Resource Management and Global Change at Humbolt University Berlin, Germany
10:10 – 10:50	Welcome Talk by: Conference Co-Chairs: Prof. Christoph Pfeifer Prof. Abdul Ghani Olabi Prof. Rafat Al Afif (Conference Coordinator)	
10:50 - 11:10	**Break**	
Session A1 "Renewable Energy & Environmental Issues" Chairperson: Prof Abdul Ghani Olabi (UOS)		
11:10 – 11:22	MHD Khaled Mahjoub	A new livestock feed Intake diet with multi health and environmental impact
11:22 – 11: 34	D. Al Absi	Kuwait's energy and water nexus: challenges and opportunities

11:34 – 11:46	Sarah Shaaban	Analyzing the national energy policy transitions for climate change mitigation in Lebanon
11:46 – 11:58	Valeria Chávez	Marine energy in the Mexican Caribbean: needs and resources
Session A "Solar Energy" Chairperson: Prof: Mohammad Ali Abdelkareem		
11:58 – 12:10	Dong-Won Kang	Crystallization control via addition of phenylethyl ammonium iodide for efficient and stable inorganic perovskite solar cells
12:10 – 12:22	Eleni Douvi	Development of a novel compact Flat-Plate Solar Collector Integrated with thermal energy storage: experimental evaluation of the energy stored under outdoors conditions
12:22 – 12:34	Mohamad Ramadan	A novel MPPT based battery solar charger
12:34 – 12:46	Ramesh Bansal	Increasing deployment of solar PV in the commercial sector in South Africa: Past greenhouse gas emissions implications and net-zero implications by 2050
12:46 – 13:00	Mohammad Ali Abdelkareem	Ni Selenide as an effective anode in DEFC
13:00 - 13:30 **Lunch Break**		
Session B1 "Wind Energy" Chairperson: Dr. Magdalena Wolf (BOKU)		
13:30 – 13:42	Jin Hur	Generation resource mix with high wind power penetration using the augmented screening curve method

13:42 – 13:54	Rafat Al Afif	Techno-economic feasibility study of a hybrid wind/biomass system - case study in west-central region of Jordan, Al-Karak city
13:54 – 14:06	Alan Kabanshi	Window size optimization and shading with photovoltaic panels: simulation of cooling energy demand in the tropics in the southern hemisphere
14:06 – 14:18	Yasmine Ayed	Techno-economic feasibility study of a hybrid wind/ biomass system in Thala, Tunisia
14:18 – 14:30	Abed Alaswad	Computational fluid dynamics simulation and material selection for vertical axis wind turbine blades
14:30 – 14:42	Jin Hur	A short-term forecasting of wind power outputs using the enhanced wavelet transform and ARIMAX techniques
Session C1 "Renewable Energy Developments" Chairperson: Dr. Jitka Hrbek (BOKU)		
14:42 – 14:54	Ramesh Bansal	Virtual power plants to add market value for the highly distributed solar PV penetration levels from commercial and residential sectors: the case of South African metropolitan cities
14:54 – 15:06	Jin Hur	Probabilistic approach to potential estimation of renewable energy resources based on the augmented spatial interpolation
15:06 – 15:18	Hegazy Rezk	Improving bio-hydrogen production-based steam reforming using fuzzy

		modelling and modern optimization
15:18 – 15:30	Enas Taha Sayed	Outgrowth of direct urea fuel cells: mechanisms, development, and challenges
15:30 - 15:45	**Break**	
Session D1 "Renewable Energy Developments" Chairperson: Prof: Abdul Hai Al-Alami		
15:45 – 15:57	Khaled Elsaid	Assessment of Fuel Cells For Dual Wastewater Treatment and Power Generation
15:57 – 16:09	Young-Ho Lee	The hydro-aerodynamic interference influence induced by semi-submersible platform motions on a FOTW performance
16:09 – 16:21	Chaeyoung Rhee	Mapping microbial dynamics in anaerobic digestion system linked with different organic substrate composition: protein and lipid
16:21 – 16:33	Linwei Ma	The role of energy efficiency improvements in the carbon neutrality of China: Retrospective and prospective analysis
16:33 – 16:45	Xiawei Liao	The water-land-energy nexus analysis of developing floating photovoltaic systems in China
16:45 – 16:57	A. Otero	Biogas potential from pig waste in Spain
16:57 – 17:09	Qui Ren See	Analysis of noise characteristics for horizontal axis tidal current turbines using computational fluid dynamics
17:09 – 17:21	Ali Alkhabbaz	The hydro-aerodynamic interference influence induced by semi-submersible

		platform motions on a FOWT performance
17:21 – 17:33	Mohamad Ramadan	Investigating Solar and wind energy coupling with Fuel Cell as Green to Green energy system
17:33 – 17:45	Montaser Mahmoud	An Investigation on the effect of configuration on the performance of organic Rankine cycle incorporating a ground-cooled condenser

Day-2 14th September 2021		
Chairperson: Prof. Christoph Pfeifer (BOKU)		
09:00-09:40	**Keynote** *by* Dr. Dina Bacovsky *"IEA Bioenergy – the role of bioenergy in our future energy system"*	Executive Committee Vice-Chair, IEA Bioenergy
Session A2 "Bio-Energy" Chairperson: Prof. Rafat Al Afif (BOKU)		
09:40 – 09:52	Ionela-Dorina Dumbrava	Evaluations of decarbonized hydrogen production from biomass gasification coupled with carbon capture via calcium looping system
09:52 – 10:08	Galina S. Nyashina	The use of biomass for pyrolysis, direct combustion and co-incineration with waste-derived fuel slurries
10:08 – 10:20	Alejandro Lyons Cerón	Co-pyrolysis of woody biomass and oil shale in N_2, CO_2, and CO_2-H_2O atmospheres
10:20 – 10:32	J. Hrbek	Impact of $Ca(OH)_2$ on combustion process of woody biomass

10:32 – 10:44	Rui Feng	Waste to bioenergy: a simulation study on stepwise pyrolysis of express packaging waste
10:44 – 11:00	**Break**	
Session B2 "Energy Storage Systems" Chairperson: Prof. Mohamad Ramadan		
11:00 – 11:12	Siqin Xiong	The role of hydrogen fuel cell trucks in delivering carbon savings
11:12 – 11:24	Hegazy Rezk	Optimal adaptive fuzzy management strategy for fuel cell-based DC microgrid
11:24 - 11:36	Kyu-Jung Chae	A critical review on the synthesis, characterization, and application of highly efficient metal chalcogenide catalysts for fuel cells
11:36 – 11:48	Tasnim Essa	Prussian blue-modified chitosan-based proton exchange membrane for better stability and selectivity in direct methanol fuel cells
11:48 – 12:00	Sang-Chul Jung	CO_2-free hydrogen production by liquid-phase plasma cracking from benzene over perovskite catalysts
12:00 – 12:12	R. Nussbaumer	Characterization of pyrolysis charcoal from municipal waste wood chips
12:12 – 12:24	Sang Mun Jeong	Reuse of silicon scrap collected from photovoltaic cell manufacturing process for lithium-ion batteries via vacuum arc plasma evaporation
12:24 – 12:36	Jan Back	Mixed-matrix membranes with renewable carbon-based filler for gas separation applications

12:36 – 12:48	Bashria Abdrubalrasoul Abdalla Yousef	Potential of Renewable Energy in Remote Areas Using Mechanical Storage System
12:48 – 13:15	**Lunch Break**	
Chairperson: Prof. Christoph Pfeifer (BOKU)		
13:15 – 14:00	**Keynote** *By* Prof. Ibrahim Dincer *"A Look into Green Hydrogen Production"*	Professor of Mechanical Engineering, Ontario Tech. University, Canada
Session C2 "Hybrid Systems" Chairperson: Prof: Amani Al-Othman		
14:00 – 14:12	Alan Kabanshi	Tech-economic analysis of PV-diesel Hybrid System as an option for Rural Electrification in Zambia.
14:12 – 14:24	Chee Meng Pang	The impacts of tidal shear profiles on the wake development of a tidal current turbine using a hybrid BEM-AD model
14:24 – 14:36	Thomas Keller	Application of non-intrusive, mobile measurement equipment for refrigeration systems
14:36 – 14:48	Seydali Ferahtia	Energy management strategies for renewable based microgrids: current status and future directions
14:48 – 15:00	Hegazy Rezk	Robust fractional maximum power point tracking for thermoelectric generation system
15:00 – 15:20	Break	
Session D2 "Hydrogen & Fuel Cell" Chairperson Prof. Martin Wendland (BOKU)		
15:20 – 15:32	Al-Mandhari	Evaluating the Effect of Membrane Thickness on the Performance of Proton Exchange Membrane Fuel Cell

15:32 – 15:44	Rahman Samuel	Development of cooling channels using computational fluid dynamics to improve the performance of proton exchange membrane fuel cells
15:44 – 15:56	Muhammad Tawalbeh	Highly proton conductive membranes based on lignin–ZrP–PTFE composite for high temperature PEM fuel cells
Session E2 "Sustainability" Chairperson: Dr. Jitka Hrbek (BOKU)		
15:56 – 16:08	Ivana M. Savic Gajic	Optimization of energy-efficient procedure for the sustainable production of oil from plum seeds
16:08 – 16:20	Abed Alaswad	Pyrolysis of agricultural waste to support sustainable farming
16:20 – 16:32	Ahmad Musamih	Strategies for Achieving Sustainable Development Goals and Nationally Determined Contributions in Norway
16:32 – 16:44	Walaa AlKhader	Sustainable development strategies in Norway: energy, food, and water nexus perspective
16:44 – 16:56	Hessa Alshamsi	Sustainable development framework and governance for electric vehicles adoption in Norway
16:56 – 17:08	Angela Hofmann	Production of sustainable energy and activated charcoal out of municipal wood residues – researching a local closed cycle in Tyrolean communities
17:08 – 17:20	M. Sadiq	Sustainable development and climate change mitigation strategies for Kuwait

17:20 – 17:32	L. Issa	Sustainable development and governance frameworks: a case study application in the energy sector of Kuwait
17:32 – 17:44	Zeshan Sheikh	Operation of inclined porous substrate bioreactor for wastewater treatment using microalgae and sustainable biodiesel-lipid production
17:44 – 17:56	Cristian Dinca	Clean energy from poplar and plastic mix valorisation in a gas turbine with CO_2 capture process

Day-3 15th of September 2021		
Chairperson: Prof. Christoph Pfeifer (BOKU)		
09:00 – 9:40	**Keynote** *by* Dr. Markus Bolhàr-Nordenkampf *"Towards Circular Economy with Resource Efficient Solutions in the Power Plant Industry"*	Director Valmet
09:40 – 10:20	***Keynote*** *by* *Prof. Hussam Jouhara "Waste Heat Recovery Potential in the Ceramics Industry"*	*Brunel University London*
10:20 – 10:30	**Break**	
Session A3 "Bioenergy" Chairperson: Prof. Mohamad Ramadan		
10:30 – 10:42	Siniša Bikić	Experimental investigation on viscosity and thermal conductivity of dispersion of agricultural biomass particles in ethylene glycol
10:42 – 10:54	See Hoon Lee	Combustion characteristics of biomass in an indirect S-CO_2 oxy-fuel CFB boiler

10:54 – 11:06	Rafat Al Afif	Development of electronic control system and computer programs for the production of biogas from biomass
11:06 – 11:18	Rui Feng	A comparative analysis on the Sino-American biomass energy policy performance
11:18 – 11:30	Hamid Rashidi	Dual fluidised bed gasification of biomass: a comprehensive model
11:30 – 11:42	Zeshan Sheikh	Effect of hydrothermal, alkaline and combined hydrothermal alkaline pre-treatment on the solubilisation of DAF sludge and its biogas production
11:42 – 12:00	**Break**	
Session B3 "Environmental Protection" Chairperson Dr. Tareq Salameh		
12:00 – 12:12	Clara Inés Pardo Martínez	The effects of environmental performance on competitiveness and innovation: a stochastic frontier approach for Colombia
12:12 – 12:24	Tudor Dobra	Environmental and economic assessment of repair solutions for cracked backsheets in photovoltaic modules
12:24 – 12:36	Abed Alaswad	The logistics of using carbon black as a heating fuel for refugees camps in Jordan
12:36 - 12:48	Stefan Cristian Galusnyak	A cradle-to-gate LCA analysis of biodiesel production coupled with post-combustion CO_2 capture applied to cement plants
12:48 – 13:00	Nabila Shehata	Management of ions and hardness in polluted Groundwater using modified

		zeolite: batch and column studies
13:00 – 13:12	Christoph Pfeifer	An experimental study on hydrothermal carbonization of cotton stalks
13:12 – 13:24	Toufic Mezher	Developing a UAE water-energy-food (WEF) nexus model and governance to Improve the policy decision-making process
13:24 – 14:00	**Lunch Break**	
Session C3 "Energy for Buildings" Chairperson: Dr. Mohammad Tawalbeh		
14:00 – 14:12	Antonio Sánchez-Braza	Non-linear income and temperature effects on residential electricity consumption on climate and coastal zones In Spain
14:12 – 14:24	M. Majidi Nezhad	Investigating and developing zero energy district using Renewable Energy Sources potential analysis; decision making studies of Lazio ports
14:24 – 14:36	Magdalena Wolf	Practical implementation of a forecast-based control system for residential buildings with thermal activated components
14:36 – 14:48	Lorenzo Bartolucci	The role of biogas on the performance of a CHP generation plant: the case study of a hospital building
14:48 – 15:00	Hegazy Rezk	Intelligent energy management strategy for DC microgrid commercial building with optimal load power estimation
15:00 – 15:12	R. San Jose	Modelling infiltration rate impacts on indoor air quality
14:12 – 14:24	M. Majidi Nezhad	Predictive maintenance strategy based on big data analysis and machine

		learning approach for an advanced building management system
15:24 – 15:36	Dagmar Juchelková	Unique organic compounds in the deposit characterizing the combustion of unauthorised fuels in domestic boilers
15:36 – 15:48	Stefano Pasquale	Hybrid Renewable Energy System Control: Experimental validation of a Digital Twin based EMS for residential applications
15:48 – 16:00	**Break**	
Session D3 "Climate Change & Environmental Issues" Chairperson Prof. Mohamad Ramadan		
16:00 – 16:12	M. Luisa Martínez	MRE needs in Mexico: opportunities, socioeconomic needs, and environmental restrictions
16:12 – 16:24	Xiaoming Ma	Value chain-based carbon emission accounting of the rising electric mobile industry
16:24 – 16:36	Petra Dolšak Lavrič	Impact of PM10 and PM2.5 emissions reduction by using torrefaction process on Slovenia national emissions release
16:36 – 16:48	Ordieres-Meré J.	Green steel as the big challenge of the European industry: contributions from the Industry 4
16:48 – 17:00	Xiaoming Ma	Carbon peak of Chinese road transportation sector- the time, value, and pathway
17:00 – 17:12	Clara Inés Pardo Martínez	Diagnosis and baseline refrigerant use in the Colombian meat, dairy, and fruit and vegetable industries
17:12 – 17:24	Ivan M. Savic	Optimization of ultrasound-assisted extraction of

		carotenoids from orange peel waste using olive oils
17:24 – 17:36	Hyeonjung Yu	Influence of different pH control strategies on microalgae cultivation in anaerobic digestion effluent
17:36 – 17:48	Eng Jet Yeo	A novel tidal current turbine blade optimisation tool using combined Genetic Algorithm and Blade Element Momentum Theory
17:48 – 18:00	Rabeea Zafar	Moving from nominal to the accurate exposure concentrations: passive sampling of widely used antibiotics
18:00 – 18:12	Muhammad Tawalbeh	A hybrid photovoltaic/solar chimney seawater desalination plant for simultaneous production of electricity and fresh water in United Arab Emirates

Day-4 16th of September 2021		
Session A4 "Solar Energy" Chairperson Dr. Bashria Yousef		
09:00-09:12	Hala J. El-Khozondar	Microgrid for remote area in Gaza Strip powered by solar energy and olive oil mill waste
09:12 – 09:24	Somchart Chantasiriwan	Determination of optimum area of water-oil heat exchanger in solar feed water heating system that uses parabolic trough collectors
09:24 – 09:36	Jun Ryu	Facile approach using mixed anti-solvent assisted perovskite growth for high performance Sn-based perovskite solar cells

09:36 – 09:48	Kantapat Palawat	Four-Zone Modeling of Mini Downdraft Gasifiers for Performance Prediction: Case Study of Semi-Batch Operation
Session B4 "Renewable Energy & Environmental Issues" Chairperson Prof. Mohamad Ramadan		
09:48 – 10:00	Valentina Gogulancea	Life cycle analysis for digestate gasification coupled with combined heat and power generation
10:00 – 10:12	Bo Bai	Quantitative analysis of electric vehicle promotion from demand side using BLP model
10:12 – 10:24	Tareq Salameh	Design and simulation solar-powered absorption chiller for 10 KW house in United Arab Emirate using evacuated tube technology with life cycle analysis
10:24 – 10:36	**Break**	
Session C4 "Bioenergy" Chairperson Prof. Christoph Pfeifer (BOKU)		
10:36 – 10:48	Maja Ivanovski	Sewage sludge torrefaction for solid fuel production
10:48 – 11:00	Reshma Babu	Study of hydrothermal treatments on sewage sludge
11:00 – 11:12	Naiwen Chen	Effects of sodium and magnesium supplement on lipid production and wastewater treatment by Rhodosporidium toruloides
11:12– 11:24	Loretta Li	Optimization of sludge-based activated carbon considering circular economy principles and its application for perfluoroalkyl substances removal
11:24 – 11:36	Sang kyu Choi	Simulation of co-pyrolysis of coffee ground and waste polystyrene foam in a

		bubbling fluidized bed reactor
11:36 – 11:45	**Break**	
Session D4 "Heat Recovery & Energy Modelling" Chairperson: Prof. Martin Wendland (BOKU)		
11:45 - 11:57	Lidija Čuček	Organic rankine cycle optimization for aluminium smelter waste heat recovery
11:57 – 12:09	Magdalena Wolf	Geothermal potential of infrastructure projects using the example of the Brenner Base Tunnel and the utilization of low-temperature tunnel heat in urban regions
12:09 – 12:21	Henrik Lavrič	Modelling the characteristics of variable speed driven pumps and Assessment of Energy savings when using state-of-the-art motors and pumps
12:21 – 12:33	Imad AIT Laasri	Numerical investigation of an innovative finned structure in a cylindrical latent heat thermal energy storage unit using a topology optimization approach
12:33 – 12:45	Ivan Pavkov	Hydrothermal carbonization of corn COB
12:45 – 12:57	Riyam B. Al-Mayyahi	A comprehensive review on the effect of magnetic field on the activity of electrochemically active microorganisms in bioelectrochemical systems
12:57 – 13:09	Gabriel Santos	Electricity market and power flow services for dynamic market simulations
13:09 – 13:30	**Short Lunch Break**	
Session E4 "Fuel & Energy" Chairperson: Prof. Martin Wendland (BOKU)		

13:30 – 13:42	Krishna Murari Pandey	Impact of passive fuel injections Techniques in the flow field of the scramjet combustor
13:42 – 13:54	Luigi Allocca	Innovative high-tressure GDI sprays characterized at engine-like conditions
13:54 – 14:06	Krishna Murari Pandey	Computational Investigation of the Reacting Flow Conditions of Two Different Fuel Jets in the Scramjet Combustor
14:06 – 14:18	Yogesh Singh	Hindering the viscous fingering instability through tapering a Hele-Shaw cell: A numerical Study
14:18 – 14:30	Akhileshwar Singh	Impact of fingering instability on the displacement efficiency: A numerical study
14:30 – 14:42	Yong-li Zhang	Gaseous products and microcharacteristics of long-flame coal spontaneous combustion effected by different oxygen concentrations
14:42 – 14:54	Emilia Dunca	Solutions for the transition to a green economy creating a mixed system for obtaining electricity unproductive lands in the Jiu valley
14:54 – 15:06	Kumari Ambe Verma	The numerical investigation of combustion performance of scramjet combustor with variation in angle of attack
15:06 – 15:18	Kaushal Kumar Sharma	Numerical investigation on the effect of variation of upper wall divergence angle of parallel fuel injection scramjet combustor performance
15:18 – 15:40	**Break**	
Session F4 “Renewable Energy & Environmental Developments”		

Chairperson Prof. Mohammad Ali Abdelkareem		
15:40 – 15:52	Amani Al-Othman	Adsorptive membranes for the removal of pharmacutical compounds from wastewater
15:52 – 16:04	O.G. Safonicheva	Environment, climate change and health- challenges and solutions
16:04 – 16:16	Ramesh Bansal	Increasing deployment of solar PV in the commercial sector in South Africa: Past greenhouse gas emissions implications and net-zero implications by 2050
16:16 – 16:28	Annamaria Vujanović	Review and environmental footprint assessment of various formalin production pathways
16:28 – 16:40	Luděk Poschmaier-Kamarád	Biochemical methane potential of olive mill waste compared to other substrates for biogas production - potential for Mediterranean countries
16:40 – 16:52	Damiana Chinese	Decarbonizing cheese production in Italy through optimized renewable energy supply
16:52 – 17:04	Dominik Bosch	Activation by means of chemical impregnation with $ZnCl_2$ – A study on surface characteristics
17:04 – 17:16	Jean Claude Banza Musamba	Fabrication of biodegradable cellulose nanocomposite hydrogel for heavy metal Ions removal: characterization, asdsorption behavior, kinetic and reusability studies
17:16 – 17:28	Nazish Iftikhar	Computational screening, molecular docking and molecular dynamics simulations of

		phytochemicals to find uorum quenching agent targeting LuxR of vibrio anguillarum
Closing Session Chairperson: Prof. Christoph Pfeifer (BOKU)		
17:30 - 17:45	**Talk by: Conference Co-Chairs:** Prof. Rafat Al Afif (Conference Coordinator) Prof. Christoph Pfeifer Prof. Abdul Ghani Olabi	

Poster Session on Monday 13th September 7, 2021 13:00 – 13:30	
Amani A-Othman	Mxenes/Zirconium Phosphate/ionic liquids membranes for high temperature PEM fuel cells
Amani A-Othman	Novel Self-Cleaning Coatings based on Zirconium Phosphates for Solar Panels
Muhammad Tawalbeh	Testing different types of scrap metallic wastes as electrodes for electrocoagulation treatment of grey wastewater
Muhammad Tawalbeh	Phosphate removal from aqueous solutions by adsorption onto black grape seeds
Fares Almomani	Bioconversion of petroleum toxic waste to high added value chemical: A process integration system
Fares Almomani	Recent advances in biogas purifying technologies: Process design and economical considerations
Fares Almomani	Review: Conversion of Algae to biofuel: Current Status and Key Challenges
Sohail Akhtar	Design of An Energy Efficient House Using Green Energy Technology with Birmingham As Case Study
Kamal Direr	Material Characterization of Fuel Cell Bipolar Plates