

2nd Euro-Global Summit on

BIOFUELS AND BIOENERGY

November 03-04, 2025

Prague, Czech Republic

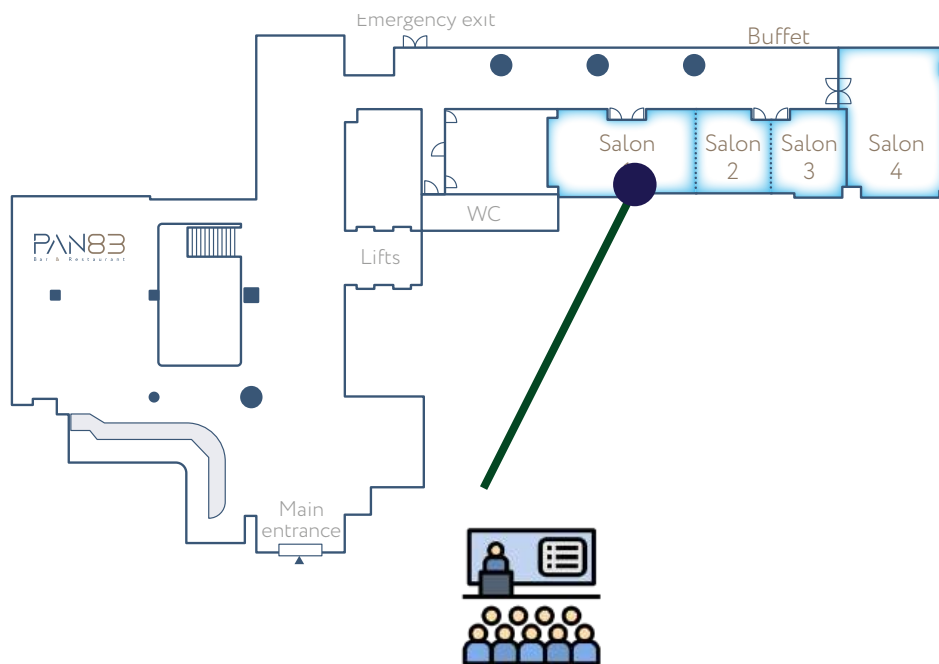


Address:

355 S. Main St., Falls Tower
1st Floor, Greenville,
South Carolina, 29601, USA

Floor Map

GROUND FLOOR



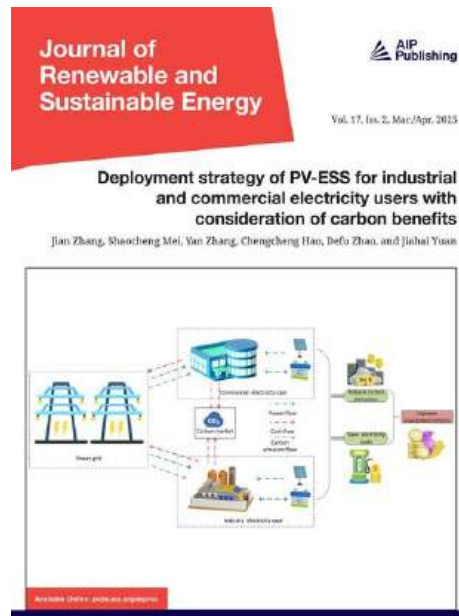
#ConferenceHall - Salon 1

Wifi Details:

Username: events

Password: events2025

Sponsor



Journal of Renewable and Sustainable Energy

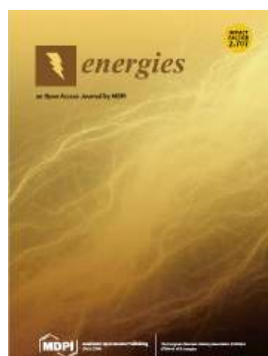
The Journal of Renewable and Sustainable Energy (JRSE) is an interdisciplinary, peer-reviewed journal covering discovery, generation, conversion and end-use of renewable and sustainable energy (RSE) relevant to the physical science and engineering communities. Specifically, JRSE focuses on new insights or creative methodologies that addresses the challenges of renewable and sustainable energy at both the system integration or key component levels.

The Journal of Renewable and Sustainable Energy (JRSE) is an online-only journal dedicated to publishing significant advances covering aspects of renewable and sustainable energy relevant to the physical science and engineering communities. As a web-based journal that publishes articles quickly, JRSE is responsive to the many new developments expected in these fields. The journal has a strong focus on integration of disciplines for renewable power technologies at global scales that have the potential to mitigate abrupt climate change. The interdisciplinary approach of the publication ensures that the editors draw from authors worldwide and across a diverse range of active and expanding fields. JRSE is published online bimonthly.

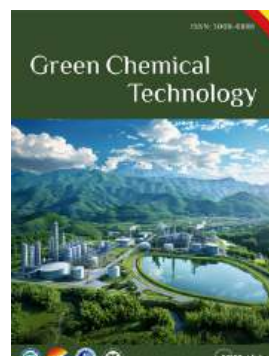
Supporting Journals



Biofuels, Bioproducts
and Biorefining



Energies



Green Chemical
Technology



Biomechanism and
Bioenergy Research



methane
an Open Access Journal by MDPI

Methane

SCIENTIFIC PROGRAM

DAY 1 - Nov 03, 2025

Meeting Hall: Salon 1

08.00 - 08.45 Registrations

Moderator

Ladislav Martinovsky, Jan Evangelista Purkyne University in Usti nad Labem, Czech Republic

08.45 - 09.00 Introduction

Keynote Presentations	
9.00 - 9.40	Title: Waste-to-Wealth: Exploring Biomass Waste-to-X Pathways for A Circular Economy
Adrian Chun Minh Loy, The University of Melbourne, Australia	
9.40 - 10.20	Title: Enzyme Testing in One Hour, Portable and Accurate
Jesse Ronquillo, GlycoSpot, Denmark	
10.20 - 10.45 Networking & Refreshments @ Foyer Eden	
Special Presentation	
10.45 - 11.25	Title: From Petroleum Contaminated Soil to Biofuels: Case Studies of <i>Miscanthus X Giganteus</i>
Josef Trogl, Jan Evangelista Purkyne University in Usti nad Labem, Czech Republic	
Oral Presentations	
Session Chair:	
Josef Trogl, Jan Evangelista Purkyne University in Usti nad Labem, Czech Republic	
Jesse Ronquillo, GlycoSpot, Denmark	
Sessions: Biofuels & Bioenergy Syngas Waste-To-Energy Biomass	
11.25 - 11.55	Title: From Phytoremediation to Functional Biochar: Valorisation of <i>Miscanthus x Giganteus</i> Biomass Grown on Marginal and Diesel-Contaminated Soil
Hana Burdova and Zdenka Kwoczynski, Jan Evangelista Purkyne University in Usti nad Labem, Czech Republic	
11.55 - 12.25	Title: Process Simulation Model for The Production of Sustainable Aviation Fuel (SAF) from Fast-Pyrolysis of Wheat Straw
Farrukh Ilyas Abid, Aalto University, Finland	

12.25 - 12.55	Title: Scaling Restoration Benefits of <i>Miscanthus</i> × <i>Giganteus</i> -based Advanced Phytotechnology: A Sustainable Strategy for Remediating Military-Contaminated Conflict Zones and Biomass Value Chain Application
Valentina Pidlisnyuk , Jan Evangelista Purkyne University in Usti nad Labem, Czech Republic	
12.55 - 13.10	Group Photo
13.10-14:00	Lunch @ Bohemia Restaurant
14.00 - 14.30	Title: Novel Catalysts for Transesterification of Oils by Ethanol
Ladislav Martinovsky, Anna Balejova and Barbora Vojackova , Jan Evangelista Purkyne University in Usti nad Labem, Czech Republic	
14.30 - 15.00	Title: Wastes of The Tannery Industry as A Cheap Source for Biofuel
Beltran Prieto Juan Carlos , Tomas Bata University in Zlín, Czech Republic	
15.00 - 15.30	Title: Can Biomass and Biofuels Substitute Fossil Sources? Overview of Related Data for EU and Czech Republic
Josef Trogl , Jan Evangelista Purkyne University in Usti nad Labem, Czech Republic	
15.30 - 16.00	Title: Valorization of Wood Biomass Ash: Soil Improvement, Waste Diversion, and <i>Miscanthus</i> × <i>Giganteus</i> -Based Phytoremediation
Abdulmannan Rouhani , Jan Evangelista Purkyne University in Usti nad Labem, Czech Republic	
16.00 - 16.30	Networking & Refreshments @ Foyer Eden
16.30 - 17.00	Panel Discussion
PANEL SESSION: Biofuels & Bioenergy, Biodiesel, Biofuels vs Fossil fuels, Biomass Conversion Technologies, Environmental Impacts of Biofuels	
• Next-Generation Biofuels • Emerging Feedstocks and Process Optimization • Role of Bioenergy in Achieving Net-Zero Emissions • Life Cycle Assessment and Carbon Footprint of Biofuels • Alternative Energy • Waste-to-Biodiesel: Municipal and Agricultural Residues • Bio-Refinery Approaches and Circular Bioeconomy Models	
Panelists:	Josef Trogl , Jan Evangelista Purkyne University in Usti nad Labem, Czech Republic
	Farrukh Ilyas Abid , Aalto University, Finland
	Valentina Pidlisnyuk , Jan Evangelista Purkyne University in Usti nad Labem, Czech republic
	Juan Carlos Beltran Prieto , Tomas Bata University in Zlin, Czech Republic
	Karel Kolomaznik , Tomas Bata University in Zlin, Czech Republic

Day 1 Concludes followed by Certificate Distribution and Vote of Thanks

SCIENTIFIC PROGRAM

#DAY 2 - Nov 04, 2025

British Summer Time (BST)

Oral Presentations

Sessions: Biodiesel Biohydrogen Sustainable Energy Green Diesel	
10.00 - 10.20	Title: Biofuel for Citizens Energy Communities
Robert W Jankowski, Polish Climate Forum, Poland	
10.20 - 10.40	Title: The Effects of Increasing Gasoline Price on Air Pollutant Levels and Their Health-Related Outcomes: An Evaluation using The AirQ+ model
Seyed Reza Khatibi, Torbat Heydariyeh University of Medical Sciences, Iran	
10.40 - 11.00	Title: Evaluation of Groundnut Oil as A Sustainable Bio-Cutting Fluid for Machining Applications
Shanmuka Srinivas, SASTRA deemed University, India	
11.00 - 11.20	Title: Alu-Alumina HVO: A Dual Waste Approach for Sustainable Energy Production
Jana M Mowafy, STEM Gharbiya High School, Egypt	
11.20 - 11.40	Title: Mathematical Model of Biogas Formation in Municipal Solid Waste Landfills
Rabaneev Kamil, People’s Friendship University of Russia, Russia	
11.40 - 12.00	Title: Bio-Methanol Production from Biomass Syngas through Multitubular Zeolite-based Membrane Reactor
Alessandro Blasi, ENEA, Italy	
12.00 - 12.20	Title: Biochar-Enhanced Cement Mortars: Dual Impacts on Carbon Sequestration and Mechanical Properties
Karim Suhail Al Souki, Jan Evangelista Purkyne University in Usti nad Labem, Czech Republic	
12.20 - 12.40	Title: Green Hydrogen for Fuelling Fuel Cells for Charging Electric Vehicles
Pravin Sankhwar, WSP, USA	
Keynote Presentation	
12.40 - 13.10	Title: Prospective on New Biorefineries GHG Reduction Capabilities for SAF and other Biofuels
Jorge Antonio Hilbert, Energy and environmental consulting, USA	

Day 2 Concludes

Day - 1

Keynote

WASTE-TO-WEALTH: EXPLORING BIOMASS WASTE-TO-X PATHWAYS FOR A CIRCULAR ECONOMY

Adrian Chun Minh Loy

The University of Melbourne, Australia

Abstract

In this keynote lecture, we will be discussing the possible routes of conversion of biomass waste to bioenergy and value-added chemicals. This lecture aims to bridge the gap between laboratory-scale research and industrial-scale biomass conversion, particularly within the hydrogen and thermal conversion pathways. The biomass transformation, including palm oil waste, biodiesel waste (glycerol), rice husk, wheat straw are the ones that will be discussed. Looking ahead, these waste streams present significant opportunities for sustainable transformation. Through near commercialization technology readiness (7-9) level studies, we aim to demonstrate how these approaches can catalyse transformative progress in the clean energy roadmap and lay a solid foundation for next-bio-economy industrial applications.

Biography

Adrian Loy Chun Minh is a McKenzie Fellow in the Department of Chemical Engineering at the University of Melbourne, Australia. His research focuses on catalysis, bioenergy, and sustainable chemical processes, with particular expertise in hydrogen production, biomass conversion, and carbon capture technologies. He has authored over 80 scholarly publications on topics such as green hydrogen generation, biorefinery valorisation, advanced catalyst design, and waste-to-energy systems. His recent work explores energy-efficient catalytic reforming, machine learning-assisted process optimization, and direct air capture using additive manufacturing.



Adrian Chun Minh Loy

The University of Melbourne, Australia

ENZYME TESTING IN ONE HOUR, PORTABLE AND ACCURATE

Jesse Ronquillo

Glycospot, Denmark

Abstract

The use of raw materials such as corn, beets, sugars for the production of biofuels involves a careful balance in their transformation of biological material to viable fuels. Enzymes play a vital role in this process. Whether it is testing the raw material to know the quality of the product, or the amount of enzymes that need to be added in the production process, enzymes play an important role. The amount of enzymes that need to be used is important to get the balance right. Most enzyme tests are performed in laboratories and can take days to get the results, which can result in delayed production or loss of product. Glycospot has developed a portable test kit, that can be performed on site with results in less than one hour. This is a game changer as at line testing is more efficient than laboratory, without compromising the quality of the results. Tests can be created to fit specific customer needs.

Biography

Jesse Ronquillo holds a PhD. In Economics with an emphasis on Renewable Energies. He has worked for several Bio-technology companies which include NCH a division of Solenis, Tescan and Lam-X. Currently he is working with Glycospot which works with clients such as Ecolab, Novonesis, and DSM.



Jesse Ronquillo

Glycospot, Denmark

Day - 1

Oral

FROM PETROLEUM CONTAMINATED SOIL TO BIOFUELS: CASE STUDIES OF *MISCANTHUS X GIGANTEUS*

Josef Trogl¹, Valentina Pidlisnyuk¹, Diana Polanska Nebeska¹, Hana Burdova¹, Zdenka Kwoczynski¹, Karim Suhail Al Souki¹, Robert Ato Newton¹, Aigerim Mamirova¹, Sylvie Krizenecka¹, Hana Auer Malinska¹, Dominik Pilnaj¹, Barbora Grycova², Katerina Klemencova², Pavel Lestinsky², Sergej Ustak³ and Roman Honzik³

¹Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic

²Technical University of Ostrava, Czech Republic

³Czech Agrifood Research Center, Czech Republic

Abstract

Miscanthus x giganteus is a perennial second-generation biofuel crop with high biomass yield and high resistance to environmental conditions. Here we overview the results of several case studies attempting of using *M. x giganteus* for phytoremediation of soils contaminated by petroleum hydrocarbons with joint production of biomass, both pot and field experiments, with focus on the plant growth and energetic properties of biomass.

The tolerance of plants towards petroleum hydrocarbons was generally high nevertheless negative synergistic effects of salinity or nutrient limitations were observed. On the other hand at lower petroleum concentrations the increase of biomass yield was observed in some cases, like some form of hormesis. Elimination of hydrocarbons was dominantly driven by rhizosphere microorganisms. No uptake of hydrocarbons by miscanthus plants was detected but significant increase of biodegradation velocity by well-developed plants was observed. Energetic properties of biomass were affected only slightly in contaminated soils compared to control soils. This included a few percent decreased combustion heat or changes of composition of pyrolysis products. This confirms good applicability of *Miscanthus x giganteus* biomass even from petroleum contaminated soils for energetic purposes.

Biography

Josef Trogl holds Ph.D. in microbiology from University of Chemistry and Technology, Prague. Since 2006 he has been working for the Faculty of Environment, Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic. His research interests include environmental microbiology and environmental biotechnology with focus on bioremediation and phytoremediation technologies. His research outputs include 3 patents, 73 journal papers (out of them 69 WOS-indexed, H-index 20), 5 five book chapters and many technology reports for industry. Since 2025 he has also been selected among ambassadors of the European Climate Pact to increase public awareness about climate change and needful measures.

FROM PHYTOREMEDIATION TO FUNCTIONAL BIOCHAR: VALORISATION OF *MISCANTHUS* × *GIGANTEUS* BIOMASS GROWN ON MARGINAL AND DIESEL-CONTAMINATED SOIL

Hana Burdova, Zdenka Kwoczynski, Diana Nebeska, Sylvie Krizenecka, Pavel Lestinsky and Josef Trogl

Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic

Abstract

The presentation traces the pathway from phytoremediation to functional materials. *Miscanthus* × *giganteus* was grown on marginal and diesel-contaminated soils to assess its potential for biomass and biochar production. Despite diesel-soil contamination, the biomass retained stable composition and calorific value. Next experiment was showing high adsorption efficiency for pharmaceuticals (atenolol, sulfamethoxazole, ethinylestradiol) from wastewater by biochar produced from *Miscanthus* × *giganteus* grown on marginal soil, achieving removals up to 90%. The study demonstrates that biomass from phytoremediation sites can be converted into valuable sorbents, offering a sustainable and circular approach to turning potentially contaminated feedstocks into functional bio-based materials.

Biographies

Hana Burdova is a Ph.D. researcher at the Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic. Her research focuses on environmental science, with expertise in mass spectrometry, soil analysis, phytoremediation, and biomass pyrolysis. She has authored over 20 scientific publications and her work has been cited in studies addressing environmental pollution, analytical chemistry, and sustainable soil remediation. Burdová specializes in advanced analytical techniques such as gas chromatography and high-resolution mass spectrometry for the characterization of environmental contaminants and bio-based materials.

Zdenka Kwoczynski is a researcher at ORLEN UniCRE and a Ph.D. graduate in Environmental Analytical Chemistry from the Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic. Her research focuses on biochar production, biomass utilization, and material characterization using advanced analytical techniques such as XRD, ICP-MS, XRF, and absorption spectroscopy.

She has authored several peer-reviewed publications on biomass pyrolysis, waste valorization, and soil remediation within the framework of the circular economy. Dr. Kwoczynski's work contributes to the development of sustainable technologies for converting biomass and waste materials into valuable environmental resources.

PROCESS SIMULATION MODEL FOR THE PRODUCTION OF SUSTAINABLE AVIATION FUEL (SAF) FROM FAST-PYROLYSIS OF WHEAT STRAW

Farrukh Ilyas Abid, Muddasser Inayat, Timo Laukkanen and Mika Jarvinen

Aalto University, Finland

Abstract

Biomass offers potential to be chosen as an alternative feedstock of fossil fuels for producing transportation fuels such as gasoline, diesel, jet fuel and other heavy oil. The motivation of studying the production of renewable fuels from pyrolysis of agriculture-based feedstock consists of multiple factors. The most important factors are the EU aviation regulations about sustainable aviation fuel, day by day increase in carbon emission, dependency on the fossil fuels. Pyrolysis process proved to be a well-established technology for producing renewable fuels from biomass as feedstock. The research methodology consists of development of steady-state process simulation model to produce sustainable aviation fuels (SAF) and other renewable transportation fuels from the fast pyrolysis of rye and wheat straw in Aspen Plus® v14. The process model is simulated to study the feed flow rate of 100 – 300 kilo-tonne/year. The key components of process model consist of feedstock pyrolysis at 550°C, catalytic hydrotreatment of pyrolysis-oil, distillation of hydrotreated-oil, green hydrogen production from proton-exchange membrane (PEM) water electrolyzer and combustion of char. The hydrotreating of the pyrolysis-oil is carried out in two stages i.e. two hydrotreater reactors. Here, all the impurities present in the bio-oil are removed and converted into their constituent components i.e. H_2S , NH_3 , H_2O and metals. The simulation model uses R_{yield} (yield based) and R_{Stoic} (stoichiometric) types of reactors. The energy requirements for the whole process, hydrogen requirements for the stabilization of oil and yield of SAF along with other transportation fuels will be reported. The results for the heat integration of the process obtained from the “Aspen Energy Analyzer” will also be discussed.

Biography

Farrukh Ilyas Abid is currently working as “Doctoral Researcher” at Department of Energy & Mechanical engineering, School of Engineering, Aalto University, Finland. Before starting the doctoral studies, he has worked as “Process Engineer” in a petroleum refinery of Pakistan from 2016 to 2023. He did Master’s in Chemical Engineering from King Fahd University of Petroleum & Minerals, Saudi Arabia in 2015. He did Bachelor’s in Chemical Engineering from University of the Punjab, Lahore, Pakistan in 2012.

SCALING RESTORATION BENEFITS OF *MISCANTHUS* × *GIGANTEUS*-BASED ADVANCED PHYTOTECHNOLOGY: A SUSTAINABLE STRATEGY FOR REMEDIATING MILITARY-CONTAMINATED CONFLICT ZONES AND BIOMASS VALUE CHAIN APPLICATION

Valentina Pidlisnyuk², Andryi Hertz¹, Oleksandr Kononchuk¹, Aigerim Mamirova^{2,3}, Abdulmannan Rouchani², Robert Ato Newton², Karim Suhail Al Souki², Josef Trogl², Pavlo Shapoval⁴, Vitalii Stadnik⁴, Tatyana Stefanovska⁵, Sergij Ustak⁶ and Roman Honzík⁶

¹Ternopil National Pedagogical University, Ukraine

²Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic

³Al Farabi National University, Kazakhstan

⁴Lviv Polytechnic National University, Ukraine

⁵National University of Life and the Environment, Ukraine

⁶Czech Agrifood Research Center, Czech Republic

Abstract

Armed conflicts often leave behind severe soil contamination from oil spills, hazardous substances, and other military-derived pollutants, posing long-term risks to ecosystems and human health. In post-conflict regions, sustainable and cost-effective remediation strategies are urgently needed to restore degraded land and enhance socio-ecological resilience. This study evaluates the potential of *Miscanthus* × *giganteus* (Mxg), a high-biomass, non-invasive perennial grass, for advanced phytomanagement of military-contaminated sites in Eastern Europe. Field trials were conducted in Ukraine (Vorzel, Kyiv region; Dolyna, Ivano-Frankivsk region) and the Czech Republic (Chomutov, Ústí region). Results show that Mxg can tolerate and stabilize contaminants such as trace elements and organics while improving soil structure and increasing organic carbon content. When combined with soil amendments (biochar, ash), Mxg cultivation enhances phytostabilization and stimulates microbial activity essential for long-term soil recovery. The harvested biomass can be utilized for bioenergy and bio-based materials (e.g., insulation, pulp, biochar), creating circular economy opportunities that support post-conflict restoration. Overall, Mxg-based phytomanagement provides a scalable and multifunctional solution for sustainable remediation of military-contaminated landscapes.

Biography

Valentina Pidlisnyuk serves as professor at the Department of Environmental Chemistry & Technology, Faculty of Environment, Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic. Her research interests include phytomanagement, biowaste treatment and valorization, biomass value chain, climate change, and sustainability. Her research outputs include 385 papers including 71 WoS-indexed articles (H-index 19), 12 Patents, two Edited Books in Springer and Francis&Taylor CRC, three chapters in Springer. She received professorship in Environmental Sciences from the Ukrainian Ministry of Education&Science, confirmed by the Ministry of Education&Science of Slovakia, and doctorate in Colloidal Chemistry from the Institute of Colloidal&Water Chemistry, National Academy of Science of Ukraine. She accomplished Fulbright Program at the University of Georgia, USA and Environmental Management Program at the Japan International Cooperation Agency, Japan.

NOVEL CATALYSTS FOR TRANSESTERIFICATION OF OILS BY ETHANOL

Ladislav Martinovsky, Anna Balejova, Barbora Vojackova, Pavel Kaule, Ivana Kadleckova, Thu Huong Nguyen Thi, Lubos Vrtoch, Tereza Duskova and Josef Trogl

Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic

Abstract

Currently, the biodiesel is dominantly based on production of fatty acid methyl esters, especially due to methanol having the highest reaction velocity of transesterification compared to higher alcohols. Nevertheless, majority of methanol is so far produced from fossil sources, which makes this biodiesel less sustainable. To achieve better kinetics of transesterification by ethanol, dominantly produced by fermentation from biosources, catalysts are required. In this contribution several novel homogenous and heterogenous catalysts suitable for production of ethyl esters of both vegetable oils as well as waste oils will be presented.

Biographies

Ladislav Martinovsky is a master's student of Applied Chemistry: Modeling of Chemical Processes at Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic. He earned his bachelor's degree in Chemistry and Toxicology at the same university, where his thesis focused on the synthesis and characterization of ethyl esters of fatty acids from waste kitchen oils and the monitoring of their stability. He gained practical experience working on a project involving waste kitchen oils at Orlen Unipetrol and currently works at Bunge, analyzing samples in the production of refined oils. His current research focuses on modeling heat transfer in mechanical ball milling processes.

Anna Balejova is a master's student of Applied Chemistry at Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic. She completed her bachelor's degree in Chemistry and Toxicology at the same university, where she worked on her thesis "Preparation of Heterogeneous Basic Catalysts Based on Siloxanes for Biodiesel Synthesis." In her current master's research, she focuses on the "Preparation of base-functionalized mesoporous organosilicates and evaluation of their catalytic activity for transesterification."

Barbora Vojackova is currently studying Applied Chemistry at Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic. She completed her bachelor's degree in Chemistry and Toxicology at the same university, where she worked on her thesis "Preparation of Heterogeneous Acid Catalysts Based on Siloxanes for Biodiesel Synthesis." Her current research focuses on acid-functionalized mesoporous organosilicates and their catalytic activity in esterification and transesterification reactions.

WASTES OF THE TANNERY INDUSTRY AS A CHEAP SOURCE FOR BIOFUEL

Beltran Prieto Juan Carlos, Kolomaznik Karel and Dostal Vladimir

Tomas Bata University in Zlín, Czech Republic

Abstract

The leather industry includes the footwear industry, whose main raw material is tanned leather, which is a product of the tanning industry. This industry processes by-products of slaughterhouses, i.e. the skins of slaughtered and hunted animals. Only 20% of the input raw material becomes the final product (footwear leather), while the remaining 80% consists of tanned and untanned waste. In relation to biofuels, the relevant materials are untanned wastes, mainly flashings, a surface layer composed of fat and non-fibrous proteins removed after fleshing of desalted hides and lime flashings, a surface layer of calcium soap removed after liming (dehairing). The content of the contribution describes the technology for processing both of the above wastes into biodiesel, biogas and products used for growing oilseed rape, and therefore indirectly also for biodiesel. For the quantitative description of individual sub-technologies and their optimization, theoretical relations of classical chemical engineering are used.

Biography

Beltran Prieto Juan Carlos completed his undergraduate and graduate studies in biochemical engineering at the Technological Institute of Celaya in México. He later obtained his doctoral degree from Tomas Bata University in Zlín, Czech Republic. His academic interests are related to mathematical optimisation of processes, catalytical systems, and technologies for the treatment of hazardous waste.

CAN BIOMASS AND BIOFUELS SUBSTITUTE FOSSIL SOURCES? OVERVIEW OF RELATED DATA FOR EU AND CZECH REPUBLIC

Josef Trogl

Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic

Abstract

Substitution of fossil fuels presents one of the key challenges in decarbonization efforts. Biofuels are considered a viable alternative, however their production in adequate quantities seems unreal due to insufficient renewable resources. Within this contribution a set of data from EU and Czech Republic will be presented to document problems of decarbonization of the transportation sector, potential renewable sources and identify research and development needs.

Biography

Josef Trogl holds Ph.D. in microbiology from University of Chemistry and Technology, Prague. Since 2006 he has been working for the Faculty of Environment, J.E. Purkyně University in Ústí n.L., Czech Republic. His research interests include environmental microbiology and environmental biotechnology with focus on bioremediation and phytoremediation technologies. His research outputs include 3 patents, 73 journal papers (out of them 69 WOS-indexed, H-index 20), 5 five book chapters and many technology reports for industry. Since 2025 he has also been selected among ambassadors of the European Climate Pact to increase public awareness about climate change and needful measures.

VALORISATION OF WOOD BIOMASS ASH: SOIL IMPROVEMENT, WASTE DIVERSION, AND *MISCANTHUS* × *GIGANTEUS*-BASED PHYTOREMEDIATION

Abdulmannan Rouhani¹, Valentina Pidlisnyuk¹, Karim Suhail Al Souki¹, Sergej Ust'ak² and Vojtech Vana²

¹Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic

²Czech Agrifood Research Center, Czech Republic

Abstract

Wood biomass ash is a waste product of many energetic applications of biomass. However, it has potential in the improvement of soil parameters either as a source of valuable minerals for plants or as a stable humus-resembling component of soil, which has got sorption properties, improves preservation soil texture, contributes to carbon sequestration or presents a carrier for microbial colonization. This can bring benefits among others in remediation of contaminated soils or marginal brownfield soils. In this presentation results from application of characterized ashes from various woody materials on the growth of giant energetic grass *Miscanthus* × *giganteus* on marginal and contaminated soils will be overviewed.

This study examined the potential of wood biomass ash (WBA) as a soil amendment to improve the growth and phytoremediation capacity of *Miscanthus* × *giganteus* (*M*×*g*) planted on marginal soils. A controlled pot experiment was established using four WBA application rates (0%, 2.5%, 5%, and 7.5%). Effects were evaluated through changes in soil chemistry (elemental composition and pH), soil biological activity (enzyme responses), and plant performance. Results indicated that soil pH initially increased with WBA addition but gradually declined in unplanted soils, whereas planted soils maintained or slightly elevated pH levels. Total organic carbon decreased in WBA treated soils, particularly in the planted 2.5% treatment (from 3.06% to 2.82%). Phosphorus and zinc concentrations increased with WBA application, most notably at 7.5% without plants, and remained elevated in planted variants. Soil enzyme activities exhibited distinct responses to WBA treatments. β -glucosidase activity declined in unplanted soils (by up to 45%) but was stabilized or enhanced under plant influence. Protease activity increased across all treatments. Plant height and dry biomass peaked at 2.5% WBA, with higher doses resulting in growth suppression. Chlorophyll content decreased

Biography

Abdulmannan Rouhani is a Ph.D. student in Landscape Reclamation and Ecosystem Services at the Faculty of Environment, J.E. Purkyně University in Ústí nad Labem, Czech Republic. His research explores how human activities, from ancient to modern, affect soil properties and investigates sustainable strategies for soil remediation. He has been studying archaeological and contemporary polluted soils from mining, landfill, urban, brownfield, and military or post-conflict areas to understand long-term anthropogenic impacts on soil systems. His primary focus is on sustainable remediation techniques using biomass ash, biochar, and phytoremediation. To date, his research has resulted in 24 journal publications (including 18 indexed in Web of Science, H-index: 8) and two book chapters.

with increasing WBA doses, from 25.60 at 2.5% to 18.63 at 7.5%, below the control value of 23.33. The findings highlight WBA as a promising resource for sustainable soil management and its integration into circular bioeconomy systems.

Day - 2

Virtual

BIOFUEL FOR CITIZENS ENERGY COMMUNITIES

Robert W Jankowski and Krzysztof Pilarski

Polish Climate Forum, Poland

Abstract

Citizens Energy Communities (CEC) are supplementing and replacing old centralized energy systems (which are crumbling just before our eyes). They are vital for low-cost energy solutions for small local communities. They can combine various renewable sources, but they need a stabilizer. That could be any solution based on biomass – biogas installation, gasifying processing unit or traditional co-generative thermal power station fed by biomass.

The transition from fossil fuels to renewables based on biomass is quite an easy process. We need to focus on a stable fuel supply stream of components with similar properties. The more diverse components of that fuel stream, the less efficient the process is.

Therefore, we propose establishing a base for that required fuel stream based on agro plantations of fast-growing trees (Shang Tong hybrid F1 in our climate zone). This is the concept of “Fast Rotation Groves” promoted so much by the European Commission. Any plantation of minimum 10 hectares can stabilize a CEC of a reasonable size (up to 100 individual consumers), as only 20% – 25% of total installed power is required from such a stabilizer.

Such a plantation can be harvested in 3-year cycles and those trees grow automatically from stumps after being cut down. This is an elegant and EKO-friendly solution and the carbon footprint is less than ZERO. Parts of such a plantation can carbonize soil (up to 16 % of total biomass) and part of the harvested biomass (up to 50 %) can be turned into biochar as a basis for ecological fertilizers. That can be stored in soil for a long time.

Biography

Robert Witold Jankowski, M.Sc. Eng. graduated from Wrocław University of Science and Technology with two degrees, currently have completed his doctoral thesis and have been going through relevant academic process at the University of Live Sciences in Poznań. Specializes in growing fast rotation crops for the purpose of climate changes mitigation - Paulownia trees of C4 photosynthesis characteristic. Invited by the European Commission to present that area of expertise during EUSEW 2025 in Brussels. Actively lobbying, with recent success, for merging Carbon Credits system with EU ETS. President of the Main Board of Polish Climate Forum, responsible for European strategy “Green Deal 2050” and the development of fast growing trees – Paulownia Shang Tong Hybrid F1 to generate Carbon Credits. Associated with environmental organizations since the mid-1960s. Organizer of public debates and conferences such as the “Anti-Smog Forum,” “AKO Climate Forum”, “Permaculture Forum”, “Biomass Forum”, “Distributed Energy Forum”, “Forest Ecology Forum”, “Green Deal 2050 Forum” and “Civic Energy Forum,” as well as follow-up activities such as the greening of city centers, the promotion of biomass as a renewable energy source, and the introduction of agroforestry complexes and fast-growing trees. Promoter of the idea of self-sufficient energy clusters basing on locally produced biomass and circular economy. Co-author of report about condition of Polish State Forestry. Author of scientific articles in Polish and international magazines. Member of Academic Civic Club consisting of more than 1000 academy professors. Initiator, organizer and speaker at projects “Polish Climate Congress 2021”, “II Polish Climate Congress 2023”, “III Polish Climate Congress 2024” and a series of radio programs “Green Poznań 2021” and “Green Greater Poland 2023”. Awarded the Silver Cross of Merit by the President of the Republic of Poland in 2022 for his actions to mitigate climate changes.

THE EFFECTS OF INCREASING GASOLINE PRICE ON AIR POLLUTANT LEVELS AND THEIR HEALTH-RELATED OUTCOMES: AN EVALUATION USING THE AIRQ+ MODEL

Seyed Reza Khatibi¹, Maziar Moradi-Lakeh¹ and Seyed M Karimi²

¹*Iran University of Medical Sciences, Iran*

²*University of Louisville, USA*

Abstract

Management of air pollution plays a pivotal role in improving human health. The main contributor to ambient air quality in urban areas is transportation. This study investigated the effect of increases in the price of gasoline on its consumption, ambient air quality, and human health. For this purpose, the data on the air pollutants (PM₁₀, PM_{2.5}, and NO₂) and gasoline consumption were collected from 2014 to 2016 for ten populous Iranian cities. Reduction in concentrations of air pollutants were estimated for the scenarios of increasing gasoline price by 50%, 80% and 200%. Then, reductions in deaths and morbidities from were estimated using the WHO's AirQ+ model. Although after the price rising the average annual levels of PM₁₀ and PM_{2.5} would decrease in all cities studied, they still remain significantly above the WHO standards. For NO₂, the levels dropped to the acceptable WHO-specified value (i.e. less than 40 µg/m³) in all cities except Tehran. Based on our modeling, in the scenarios of price rising by 50, 80, and 200%, there were 104, 133, and 197 avoided PM₁₀-related deaths per year in people older than 30 years, respectively. The annual reductions were 1,308, 1,619, and 2,405 for PM_{2.5}-related deaths and 3,662, 4,779, and 7,460 for NO₂-related deaths. Significant reductions were also estimated for other outcomes such as heart disease, lung cancer, chronic obstructive pulmonary disease, and acute lower respiratory tract infection. Beyond the health benefits, lower consumption of fossil fuels could be an important mitigation strategy against climate change. This study can be a base for evidence-informed policy making in the field of energy subsidization and pricing in Iran. Such strategies need to be sinked with a tangible shift of subsidies towards clean transportation, and especially low-emission public transport or other pro-poor alternatives.

Biography

Seyed Reza Khatibi is a professor assistant at the Torbat Heydariyeh University of Medical Sciences. He received his MD from the Iran University of Medical Sciences, his MPH from the Tehran University of Medical Sciences, and his PhD from the Iran University of Medical Sciences. Dr. Khatibi serves as a subject editor for the Journal of Torbat Heydariyeh University of Medical Sciences. His research interests include burden of diseases, health impact assessment and nutrition. He has published more than 26 papers in reputed journals and is a reviewer in the Journals of Torbat Heydariyeh University of Medical Sciences, BMC Public Health and Journal of Health, Population and Nutrition.

EVALUATION OF GROUNDNUT OIL AS A SUSTAINABLE BIO-CUTTING FLUID FOR MACHINING APPLICATIONS

Maddula Shanmuka Srinivas¹, Tumula Tirumala³, Sangeeth Purushothaman² and Kasani Tirupataiah⁴

¹*SASTRA deemed University, India*

²*QIS College of Engineering and Technology, India*

³*National Institute of Foundry and Forge Technology, India*

⁴*Adamas University, India*

Abstract

Machining plays an important role in manufacturing, especially in achieving the desired dimensions and surface quality of components through controlled material removal. During machining, a large amount of heat is generated due to friction at the tool-workpiece interface. To manage this, cutting fluids are commonly used for cooling and lubrication. These fluids help reduce tool wear, improve surface finish, and maintain dimensional accuracy. However, conventional cutting fluids often contain additives such as chlorine and sulphur, which pose serious health and environmental concerns due to their toxicity and poor biodegradability. To overcome these drawbacks, industries are now moving toward green cutting fluids, an eco-friendly alternative designed to ensure sustainable and safe machining practices. These fluids are generally based on vegetable oils, water-soluble formulations, or synthetic esters, which are renewable and biodegradable. Among these, vegetable-based cutting fluids have shown excellent potential because of their superior lubricating ability, high viscosity index, and minimal environmental impact.

In this study, machining experiments were carried out on Al 6061 (T6) and AISI 1018 mild steel using groundnut oil as a green cutting fluid. Groundnut oil, extracted from peanuts, offers several advantages. It is naturally biodegradable and non-toxic, making it safe for operators and the environment. Its inherent lubricating properties help reduce friction and wear during machining, improving tool life and surface finish. The high flash point and good oxidation stability of groundnut oil also make it suitable for use under elevated temperature conditions typically encountered in metal cutting operations. The use of groundnut oil provides an effective balance between cooling and lubrication. It forms a thin lubricating film at the tool-chip interface, which minimizes heat generation and prevents material adhesion on the tool surface. As a result, the machining process becomes more stable, with lower tool wear and better surface integrity of the workpiece.

Biography

M. Shanmuka Srinivas is a Ph.D. research scholar in Mechanical Engineering at IIT Tirupati working on sustainable post-processing of additively manufactured components, with emphasis on biodegradable lubricants and viscoelastic abrasive finishing. His work integrates experimental tribology, surface metrology and materials characterisation to develop environmentally responsible finishing solutions.

The findings from this study suggest that groundnut oil can serve as a viable and sustainable alternative to conventional mineral-based cutting fluids. Its use supports the growing global emphasis on environmentally responsible manufacturing while maintaining or even improving machining efficiency. Overall, groundnut oil demonstrates strong potential as a green cutting fluid due to its excellent biocompatibility, lubrication characteristics, and environmental friendliness. The adoption of such bio-based fluids not only enhances machining performance but also contributes to the broader goal of sustainable and cleaner production practices in modern manufacturing.

ALU-ALUMINA HVO: A DUAL WASTE APPROACH FOR SUSTAINABLE ENERGY PRODUCTION

Jana M Mowafy

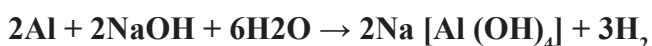
STEM Gharbiya High School, Egypt

Abstract

The world currently faces a severe energy crisis caused by our overreliance on non-renewable energy sources which has contributed to enormous environmental threats. At the same time landfills continue to expand, especially from materials such as aluminium cans and used cooking oil. These dual challenges led me to an important question: can we tackle both problems simultaneously? That's when the idea of Alu-Alumina HVO was born: to introduce an innovative approach in energy production.

The project focuses on Hydrotreated Vegetable Oil (HVO) production, a second generation biofuel produced through the reaction between hydrogen and vegetable oils, unlike other biofuels it's known for its high energy density and full compatibility with diesel engines. However, its widespread adoption faces two critical barriers: high production costs of hydrogen and dependence on agricultural feedstock.

The project overcomes these barriers by utilizing aluminium cans in hydrogen generation through this reaction:



In this process, aluminium reacts with sodium hydroxide NaOH and water, releasing hydrogen gas and produce aluminate by-product. Moreover, the byproduct aluminate $\text{Na} [\text{Al}(\text{OH})_4]$ was repurposed in the production of activated alumina, a highly efficient water adsorbent used in removing hydrogen's moisture, which is necessary to preserve HVO's quality. This process is expected to achieve hydrogen generation with over 90% conversion efficiency.

To eliminate competition with food resources, used cooking oil was utilized after it undergoes five treatment steps: filtration, water degumming, acid degumming, neutralization and drying, preparing them for conversion into biofuels with low sulfur content and cetane number between 70-75.

Biography

Jana Mohamed Nabil Mowafy, a G12 student at STEM Gharbiya school in Egypt, with a strong passion for energy and sustainability. Over the past three years, I've led and contributed to four major research projects tackling critical global issues such as air pollution, water pollution, climate change, and clean electricity generation.

My specific interest in biofuels and energy sustainability began with PULP-POWER, a project that exploit wastewater in ethanol generation. While working on it, I realized ethanol's limitations as a fuel and was inspired to introduce an affordable, standalone, eco-friendly and full- engines computable alternative to conventional diesel, which led me to my current project Alu-Alumina HVO.

Beyond projects, I have authored more than six academic posters and portfolios presenting my work, and submitted Alu-Alumina HVO to major competitions such as:

Zayed Sustainability Prize 2025, ITC 2025, and UGRF Undergraduate Research Forum Competition 2025. Moreover, I was selected as a finalist at Intel ISEF 2025 for a project related on ethanol production and accepted into the highly competitive Minerva Research initiative.

Alongside, my research and projects, I was honoured with Certificates in Graphic design from PIXISPACE company, digital marketing approved by IDTA and TIEC, medical analysis approved by The Middle East Paramedic, from Resala initiative, and Minerva Research Program.

Through this integrated approach, the project not only reduces production costs and minimizes environmental waste, but also provides a sustainable, eco-friendly, and standalone alternative to conventional fuels, addressing both environmental and energy sustainability.

MATHEMATICAL MODEL OF BIOGAS FORMATION IN MUNICIPAL SOLID WASTE LANDFILLS

Rabaneev Kamil and Nikulina Svetlana

People's Friendship University of Russia, Russia

Abstract

Effective management of Solid Municipal Waste (SMW) is a critical component of climate change mitigation strategies and the transition to a circular economy. Landfills, while necessary, are significant sources of methane, a potent greenhouse gas. Harnessing this gas as renewable biogas requires accurate and reliable prediction of its generation potential and rates to ensure the efficient design and operation of collection and utilization infrastructure.

This study presents the development, justification, and practical application of a mathematical model for predicting biogas formation dynamics at SMW processing and composting sites. Unlike simpler models, this approach explicitly integrates the influence of site-specific factors, including local climatic conditions (temperature and moisture) and the morphological composition of disposed waste, which are crucial determinants of anaerobic decomposition activity in temperate climates.

The model is fundamentally rooted in first-order reaction kinetics, describing the exponential decline in gas production rate as organic substrate is depleted. To enhance predictive accuracy, the model incorporates a modified Arrhenius equation, which adapts the decomposition rate constant to prevailing temperatures, coupled with a function that quantifies the modulating effect of moisture content within the landfill body. This allows for a dynamic forecast of gas output over the operational lifespan of the site.

The developed model was validated using real operational data from a modern SMW landfill in the Udmurt Republic, Russia, covering waste disposal volumes from 2020 to 2024. The calculations demonstrated a high degree of fidelity, revealing daily biogas formation rates $Q(t)$ consistently ranging from approximately 59 to 68 m³/day across the analyzed period. This confirms the model's capability to accurately reflect the degradation dynamics of organic matter.

The practical utility of this predictive tool is substantial. It enables

Biography

Kamil I. Rabaevev holds a bachelor's degree in Energy and Resource-Saving Processes in Chemical Technology, Petrochemistry, and Biotechnology from the People's Friendship University of Russia (RUDN University). He is currently pursuing his master's degree at the same institution, specializing in Applied Mathematics and Informatics: Forecasting Bioprocesses in Ecology. This academic shift reflects his commitment to applying advanced computational methods, such as data analytics and machine learning, to solve pressing environmental challenges. Kamil is an active and often victorious participant in various technology accelerators. His research is published in several highly regarded Russian academic journals (VAK and RSCI listed), and he is an annual contributor to the international ecological conference series, GREEN.

waste management authorities and engineering firms to precisely plan the timing and scale of degassing infrastructure, optimize the design parameters for gas collection and utilization systems, and conduct accurate technical and economic analyses. The model provides a clear, computationally simple, yet robust framework for evidence-informed decision-making in the design and subsequent management of waste-to-energy facilities.

BIO-METHANOL PRODUCTION FROM BIOMASS SYNGAS THROUGH MULTITUBULAR ZEOLITE-BASED MEMBRANE REACTOR

Alessandro Blasi, Nadia Cerone, F Zimbardi, L Contuzzi, C Florio, G Zito, V Valerio, A Villone, O Carnevale and C Ragone

ENEA, Italy

Abstract

The transition toward sustainable energy systems requires innovative processes for converting renewable resources into fuels. These fuels offer a sustainable solution for defossilising hard-to-electrify sectors, such as maritime transport, aviation, and certain industrial processes, serving as critical energy carriers in the transition to a low-carbon economy. Among these, the valorisation of syngas derived from biomass gasification offers a promising pathway for biofuel production. Typically, in this stream, the hydrogen-to-carbon oxides ratio (H_2/CO_x) is not sufficient to achieve the complete conversion of carbon oxides into products like methanol. The integration of green hydrogen can enable the adjustment of the H_2/CO_x ratio to the stoichiometric values. In this work, an innovative approach for bio-methanol production is proposed, employing a multitubular zeolite-based membrane reactor with a nominal capacity of $0.25 \text{ Nm}^3 \cdot \text{h}^{-1}$ of syngas. The reactor utilizes a $\text{Cu}/\text{ZnO}/\text{Al}_2\text{O}_3$ catalyst and integrates six alumina tubes coated externally with a zeolite LTA layer, housed in a stainless-steel shell. The core innovation lies in the application of a selective membrane, which intensifies the process by shifting the reaction equilibrium through in situ removal of one of the products, water. Zeolites, specifically the LTA-type with a Si/Al ratio greater than 1, were synthesized hydrothermally to ensure stability under the reactor's operating conditions. Their well-defined microporous structure (pore size 3-5 Å) acts as a molecular sieve, selectively permeating water formed during the hydrogenation reactions. Nitrogen is introduced as a sweep gas into the lumen side of the membrane to facilitate the continuous removal of water. Methanol is recovered from the retentate gas in a cold trap. The experimental tests were carried out in a range of temperatures of 220-270°C and 35-40 bar of pressure. This membrane-assisted approach significantly enhances the methanol yield—doubling it compared to conventional fixed-bed reactors—without the need for recycling unreacted gases. The combination of membrane separation and catalysis within a single intensified unit demonstrates a viable path forward for efficient, renewable methanol synthesis from biomass syngas.

Biography

Alessandro Blasi is a Doctor of Engineering affiliated with ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development). His research focuses on renewable energy and biofuels, with expertise in biodiesel production, transesterification, gasification, and heterogeneous catalysis. Dr. Blasi has authored over 30 scientific publications, contributing significantly to advancements in biomass conversion and sustainable fuel technologies.

BIOCHAR-ENHANCED CEMENT MORTARS: DUAL IMPACTS ON CARBON SEQUESTRATION AND MECHANICAL PROPERTIES

Karim Suhail Al Souki¹, Saddam Hussain Mubin², Robert Ato Newton¹, Abdulmannan Rouhani¹, Aigerim Mamirova¹, Sergej Ust'ak³, Roman Honzík³ and Valentina Pidlisnyuk¹
Karim Suhail Al Souki¹, Saddam Hussain Mubin², Robert Ato Newton¹, Abdulmannan Rouhani¹, Aigerim Mamirova¹, Sergej Ust'ak³, Roman Honzík³ and Valentina Pidlisnyuk¹

¹Jan Evangelista Purkyně University in Ústí nad Labem, Czech Republic

²Dresden University of Technology, Germany

³Czech Agrifood Research Center, Czech Republic

Abstract

This research investigates the potential of biochar, a carbon-rich by-product from pyrolysis, as a sustainable additive in cement mortars to simultaneously capture carbon dioxide (CO₂) and influence mechanical properties. Two biochar types were assessed: The “Sewage Sludge Biochar (SSB) and Food-Wood Waste Biochar (FWB)” at different application rates (2, 4, and 8 wt%) in cement. The biochars were analyzed for their physicochemical properties, and the resulting mortars were tested for compressive strength, flexural strength, and CO₂ adsorption capacity. Results indicated that a 2 wt% biochar dosage was optimal, with SSB-mortars showing a 12% increase in compressive strength and a 31% higher CO₂ adsorption compared to control samples. In contrast, FWB had a higher fixed carbon content but a less pronounced effect on mechanical strength. The findings demonstrate that low-dose biochar incorporation, particularly SSB, offers a promising pathway for developing carbon-sequestering construction materials with enhanced or maintained structural integrity.

Biography

Karim Al Souki, currently an assistant professor at the faculty of Environment in Jan Evangelista Purkyně University (UJEP) in Ústí nad Labem (Czech Republic). His scope of research mainly focuses on the soil/plant interactions in the context of the phytomanaging and enhancing the quality of contaminated and/or degraded soils, with the application of different plant models (miscanthus, quinoa, etc), along with the sustainable valorization of the produced biomass within the framework of circular economy. He obtained his PhD from the University of Lille 1 - Sciences and Technologies in France, while working in the Civil Engineering and geo-Environment (LGCgE) lab at ISA-Lille between 2014 and 2017. So far, I have published more than 20 scientific papers. Besides research work, he also has teaching and supervising activities for PhD and Masters students as well as the internationalization activities at the university.

GREEN HYDROGEN FOR FUELLING FUEL CELLS FOR CHARGING ELECTRIC VEHICLES

Pravin Sankhwar

WSP, USA

Abstract

The processes involving green hydrogen generation from plastics by using thermochemical processes like pyrolysis and gasification. Then this derived hydrogen runs the fuel cell that produces electricity which can directly feed DC power to the charge the electric vehicles (EVs). Although this complex process has many challenges related to energy efficiency during the conversion processes starting from generation of hydrogen from thermochemical processes and hydrogen storage followed by fuelling the fuel cells and charging EV infrastructure. Simplistic MATLAB-Simulink modelling developed for this research demonstrates how and an ecosystem of such process can be made feasible commercially. Green hydrogen generates from known techniques known through literature but harnessing hydrogen from plastics promises additional benefits from green-house-gas (GHG) emissions reduction. Overall feasibility of using green hydrogen using this methodology is not limited by possible cost inefficiency especially when there are savings gained from GHG emission reduction. EVs have been successful in becoming commercially viable because of high energy density Li-ion batteries. And therefore, research continues to optimize the performances with integration of renewable energy, and battery storage systems. This study adds another potential from green hydrogen which adds additional power source to the power grid especially motivated at reducing GHG emissions at the same time. Additionally, using direct current (DC) power generated from fuel-cell allows using it further directly to run EV charger at DC input voltages. Especially, designed systems to run at DC voltages throughout the power system is a potential available through combination of high voltage direct current (HVDC), renewable energy, DC-DC converters, DC EV charger, and many other supporting components. The plastics have been major contributor for environmental wastes across the globe, been able to generate useful green hydrogen from them by eliminating any wasteful process by optimizing becomes a topic of exploration from literature review for this study. The MATLAB-Simulink model is a stepping stone in working towards a novel and innovative process of green hydrogen production to

Biography

Pravin Sankhwar has a passion for optimizing the performances of the electrical power engineering industry, Dr. (hon.) Pravin Sankhwar brings an extensive amount of experience in engineering design and research. Holding a degree in master's in electrical engineering from Michigan Tech, a bachelor's in electrical engineering from Malviya National Institute of Technology, and a PhD candidate, he combines academic knowledge with practical expertise to drive meaningful change in renewable energy industry. Throughout his career, Pravin Sankhwar has successfully delivered services in promoting energy efficiency, reduce carbon footprints, design power distribution systems, review research papers for major journals, judge student presentations and industry award events, and publish research articles. He believes in the power of collaboration and innovative thinking to address sustainable practices in the electrical power engineering industry.

run electric vehicle charging infrastructure. The limitations of the study would be governed by effective establishment of locations where waste management services are performed (for example, landfills & so on). The most feasible way to connect power lines and route in a manner to reduce any losses from copper losses is another aspect that opens the door for further research on reduction of system inefficiencies. This study however enlists and discusses the major limitations and recommends the new process introduced to power systems for meeting long term goals in GHG emission reduction and converting the planet clean and green.

PROSPECTIVE ON NEW BIOREFINERIES GHG REDUCTION CAPABILITIES FOR SAF AND OTHER BIOFUELS

Jorge Antonio Hilbert and Adriana Camardelli

Energy and environmental consulting, Argentina

Abstract

Presentation of a 2025 prospective study of a biorefinery in Bahía Blanca, Argentina, evaluating technological alternatives for the production of SAF from corn and wheat. The emission savings of the biofuels produced were used as a comparative indicator. Several alternatives were included, such as the incorporation of biogas plants, CO₂ capture and variable drying of DDGS. The results showed that the capture and valorization of biogenic CO₂ can exceed 100% emissions reduction when the credit for avoided emissions is considered. The combination of biogas, partial drying of DDGS and CO₂ capture achieved a reduction of 77.79%, standing out as a viable and sustainable alternative. The study concludes that a comprehensive strategy that combines thermal efficiency, use of by-products and recovery of captured CO₂ allows regulatory thresholds to be reached and exceeded, consolidating the sustainable profile of the projected bioethanol. In the case of SAF, the requirements for this biofuel regulated by ICAO at the international level are exceeded. Discussions on iLUC uneven application for different crops will be included.

Biography

Jorge Antonio Hilbert is an Agricultural Engineer UBA, 1980. M.Sc. Mec. Agrícola, UNLP 1990. Currently Director of Energy and Environmental Consulting Services, Member of the Scientific Advisory Board IINAS Germany and of the Sustainability Research Coordination Network (RCN) USA, he has coordinated modules in five projects in the European Union. Auditor of organizational and project carbon footprints under ISO-14064 standards and Verra protocols. Member of the biogas initiative done right. Consultant for the most important companies in the agricultural and agro-industrial sector.

Past responsibilities: Member of the United Nations Life Cycle Initiative steering committee, Scientific Coordinator of the MINCYT Biorefineries Group, Director of the Institute of Rural Engineering, Coordinator of the National Bioenergy Program of INTA. Coordinator and teacher in various postgraduate careers directing theses and final projects. UBA, UTN UNLP Comahue. Chaired the bioenergy commission, professional council agronomy CPIA and cochair biogas committee of the Global Methane Initiative. Author of more than 79 research works and 218 technical dissemination works, 7 books.

Bookmark the Dates

3rd Euro-Global Summit on

BIOFUELS AND BIOENERGY

October 12-13, 2026

London, UK

Address: 355 S. Main St., Falls Tower
1st Floor, Greenville,
South Carolina, 29601, USA