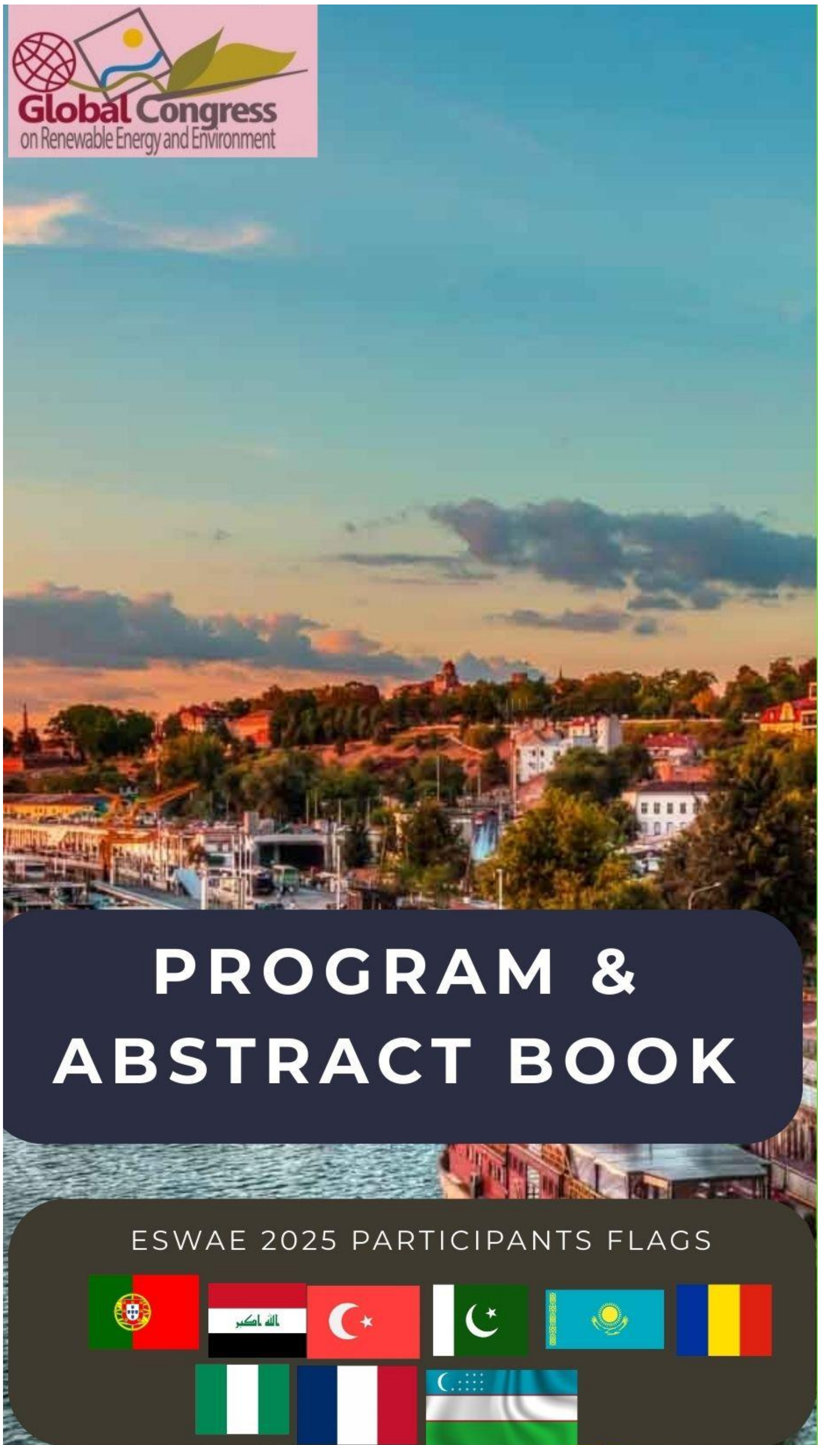
Global Congress on Renewable Energy and Environment



PROGRAM & ABSTRACT BOOK

ESWAE 2025 PARTICIPANTS FLAGS

DECEMBER 05– 07, 2025| ISTANBUL AYDIN UNIVERSITY
ISTANBUL, TURKEY

ESWAE-2025

12TH GLOBAL CONGRESS ON
RENEWABLE ENERGY AND ENVIRONMENT

https://www.globalcenter.info/eswae/

TAEG The Academic Events Group

ABAI UNIVERSITY

IJ-CISS International Journal of Current Innovations in Interdisiplinary Scientific Studies

NEAR EAST UNIVERSITY

Birlesik Dünya Arastırma BD CENTER Inovasyon ve Yayıncılık Merkezi

Contemporary Educational Research Journal

12th Global Congress on Renewable Energy and Environment (ESWAE-2025)

https://www.globalcenter.info/eswae/

Istanbul Aydın University
Hall Name: T Block Purple
Beşyol, İnönü Cd. No:38, 34295 Küçükçekmece, İstanbul, Türkiye
Istanbul – Turkey
December 05 -07, 2025

Online Participation Link
https://meet.google.com/pat-vqbb-vtp

TIME ZONE (GMT+3)

PROGRAM & ABSTRACT BOOK

Organizing Committee
Program Chair
Prof. Dr. Haluk Soran, Near East University, North Cyprus

International Program Committee
Dr. Pooja Bansal, Jamia Millia Islamia, India
Abdollah Esmaeili, National Iranian South Oil Company (NISOC), Iran
Nehir Varol, Ankara University, Turkey
Necdet Alpaslan, Dokuz Eylül University, Turkey
Deniz Dölgen, Dokuz Eylül University, Turkey
Mikdat Kadioğlu, Istanbul Technical University, Turkey
Nazim Kasot, Cyprus International University
Mike Kirkwood, Transmission T.D. Williamson Inc. UAE

International Organizing Committee
Florijeta Hulaj, AAB College
Lilia Trushko, Girne American University
Metin Berk Odabaşı, Warwick University
Semih Çalışkan, Yaşar University
Zeynep Genç, Istanbul Aydın University

Secretariat
Onwudiwe Kenechukwu, University of Kyrenia, Cyprus
eswae.info@gmail.com

KEYNOTES

PROF. DR. HACI DURAN, ISTANBUL
AYDIN UNIVERSITY, TURKEY

Title

"Cultural and Economic Consumption of Nature and Naturalness"

Biography

Prof. Dr. Hacı Duran is the Head of the Sociology Department at Istanbul Aydın University. He earned his doctorate from Istanbul University. He conducted academic research at Sakarya, Gaziantep, and Adıyaman Universities. He also served as Dean. He has published numerous popular science articles on environmental issues in the Local Siyaset magazine. He has also published numerous scientific articles in the fields of Education, Management, Religion, Labor, and Industrial Sociology. In recent years, he has contributed to numerous scientific organizations, particularly in the Middle East and North Africa, through his research and lectures. He speaks Arabic and English.

He currently conducts research on the sociology of health and environmental issues. He publishes popular science articles on his blog, www.haciduran.com, which has been active for 15 years. He is also the author of a book, The Dynamics of the Industrial Age.

PROF. DR. HUSEYIN UZUNBOYLU,
UNIVERSITY OF KYRENIA, NORTH CYPRUS.

Title

"Considerations for publishing environmental research articles in high-impact journals: Scopus and Web of Science"

Biography

Prof.Dr. Huseyin Uzunboylu he had completed high school at 20 Temmuz High School in Cyprus. In 1985, his higher education career began by winning the Anatolia University, Department of Communication and Planning on Education in Turkey. And after he had completed his preparatory education in one year and he completed his undergraduate degree in 1991. Prof. Dr. Huseyin Uzunboylu started his graduate education at Ankara University, the Department of Curriculum and Instruction in 1993 and graduated in 1995. He was accepted into the doctoral program in the same university, Educational Technology Department of Educational Sciences in 1995 and he completed his PhD degree in 2002. In 2003, he became an Assistant Professor in the Department of Computer Education and Instructional Technology at the Near East University. He was an Associate Professor in 2005 in Ataturk Faculty of Education, and in December 2010, with respect to the members of juries he was appointed as a professor. After doctoral studies he started working at the Near East University, Faculty of Arts and Sciences Department of Psychology in 1996 and he taught courses that educational sciences and research methods. He coordinated of 'Pedagogy Certificate Program' which was conducted by the University from 1997 to 1999, and since he conducted Chairman of the Department of Computer Education and Instructional Technology from 2004 to 2013. From 2013 to 2018, he serves as a Dean of Faculty of Education. Since 23 October 2019, he is appointed to member of Higher Education Planning, Supervision, Accreditation and Coordination Board by President of North Cyprus (TRNC). Prof. Dr. Uzunboylu has five academic books published by Turkey's respected publishing firms; he has supervised five doctoral and 63 master's theses up to now. He has 103 high-level articles that are searching by Web of Science (SSCI, SCI, SCI-Expanded, ESCI); He has 27 searching articles, and published papers are presented on international or national conferences. He is editor-in chief of the Cypriot Journal of Educational Sciences; also, Prof. Dr. Uzunboylu serves as the boards of many journals referee within the searching in the Social Sciences Citation Index. Since 2004, he is taking place on the list as founders, and he is president of the Cyprus Educational Sciences Association (KEB-DER). In 2010, Prof. Dr. Uzunboylu has a major role representing KEB-DER and put effort into being a full member of European Educational Research Association.

PROGRAM
05/12/2025, Friday

Session 1
14:00 – 16:00
Oral and Online Presentation

ORDER	TITLE	AUTHOR, AFFILIATION, and COUNTRY
1	Uncovering Drivers of Political Resistance to the Phase-Out of Russian Fossil Fuels in Europe: Mapping Narratives, Dependencies, Financial Influence	Ivan Hortal Sanchez, Belgium
2	A Novel Approach for Solar Power Generation Using Greenhouse Heating	Bharath Srinivas Srikanth, OTH Amberg-Weiden, Germany
3	Assessment of Foreign Langauge Learning at High (Secondary) School and University levels In Terms of CEFR Standards	Mehmet Temur, Inonu University, Turkey

06/12/2025, Saturday

06.12.2025 10:00 – 10:10	**Opening Ceremony**	**Hall 1**

TIME	TITLE	SPEAKER	HALL NAME
06.12.2025 10:10 – 10:40 **Keynote 1**	Cultural and Economic Consumption of Nature and Naturalness	**Prof. Dr. Hacı Duran, Istanbul Aydin University, Turkey**	**1**
06.12.2025 10:40 – 11:20 **Keynote 2**	Considerations for publishing environmental research articles in high-impact journals: Scopus and Web of Science	**Prof. Dr. Huseyin Uzunboylu, University of Kyrenia, North Cyprus.**	**1**

11:20 – 11:30	**Coffee break**

Session 2
11:30 – 13:00
Oral Presentation

ORDER	TITLE	AUTHOR, AFFILIATION, and COUNTRY
1	The Impact of Fine Arts on Environmental Awareness and Eco-Aesthetic Pursuits.	Ebru Erbudak, Istanbul Aydın University, Turkey
2	Use of green-synthesized ZnO nanoparticles as a photocatalyst to degrade a textile dye into aqueous solution	Tarek Berrama, University of sciences and technology Houari Boumediene, Algeria
3	Characterization of Two-Phase Flow Regimes in Hydrophobic Micro-Channels for PEM Fuel Cells	Nouara Ibrahim-Rassoul, University of Sciences and Technology Houari Boumediene USTHB, Algeria Yacine Salhi, University of Sciences and Technology Houari Boumediene USTHB, Algeria El-Khider Si-Ahmed, Nantes Université, France
4	Digital Sequence Information (DSI) and the Nagoya Protocol: Update, Ambiguities, Challenges and Regulatory Gaps	Pascale Joseph
5	Proposing a novel solar-driven hybrid system for water, cooling, and power production	Mahdi Deymi-Dashtebayaz, Hakim Sabzevari University, Iran
6	Mapping Renewable Energy Publications: A Bibliometric Analysis Using Rstudio Bibliometrix	Yasemin Ozliman Farimaz, Ege University, Izmir Bakircay University, Turkey Melih Soner Celiktasa, Ege University, Solar Energy Institute, Turkey

13:00 – 14:00	**Lunch**

ORAL PRESENTATIONS

14:00 – 16:00

Session 3

ORDER	TITLE	AUTHOR, AFFILIATION, and COUNTRY
1	Intelligent control based on Machine Learning of Energy Sharing in Wind-Based Microgrids AYMEN BAMAAROUF PhD Student, Electrical Engineering, Higher	Aymen Bamaarouf, Electrical engineering, Morocco
2	Investigating the pressure distribution of an airfoil with a cylindrical body	Mohammad Hossein Ghadimi Gorakhk, Malek Ashtar University of Technology, Iran.
3	Contribution to the attack of sulfate water on the environment of the Hammam-Debagh dam in Algeria	Ben Khadda Ben Ammar, University of Biskra, Algeria
4	Competitive And Non-Competitive Adsorption of Heavy Metal Ions by Brut Keratin Powder from Algerian Sheep Horns	Rafika Souag, University of Boumerdes, Algeria Fatiha Sidi Ali, University of Boumerdes, Algeria Nessrine Seddiki, University of Boumerdes, Algeria
5	Competitive Advantages of Iran's Tourism Industry in the International Arena: An Analysis Using Porter's Diamond Model	Nasrin Kazemi, University of Tehran, Iran
6	Barriers to engaging foreign stakeholders (Iranians living abroad) in tourism development and investment in Iran	Nasrin Kazemi, University of Tehran, Iran
7	Investigation of Optical Spots Formed on the Photomatrix Surface by Continuous Optical Radiation Propagating Through an Optical Fiber	Mehtiyev Ali, Kazakhstan Institute of Standardization and Metrology, Kazakhstan Alkina Aliya, Kazakhstan Institute of Standardization and Metrology, Kazakhstan

POSTER PRESENTATIONS

14:00 – 16:00

Session 4

1	Comparative assessment of different faults impact on photovoltaic array-based serial / parallel configuration	Ahmed Mohammedi, University of Bejaia, Algeria Abdelaziz Zerglaine, University of Chlef, Algeria Nasser Eddine Mebarki, University of Bejaia, Algeria Rachid Taleb, University of Chlef, Algeria
2	Comparative Study of Photocatalysis and Sonophotocatalysis for Textile Dye Degradation Using MgAl2O4	Mohamed Belmedani, University of Sciences and Technology Houari Boumedienne, Algeria Asma HEMMI, University of Sciences and Technology Houari Boumedienne, Algeria El Hadj MEKATEL, University of Sciences and Technology Houari Boumedienne, Algeria
3	Exploring Third-Generation Biodiesel Production from Chlorella vulgaris Microalgae	Karima Bourenane, University of Sciences and technologie Houari Boumediene, Algeria Imene Boutaleb, Algeria Ilhem Fegas, University of Sciences and technologie Houari Boumediene, Algeria Samia Briki, University of Sciences and technologie Houari Boumediene, Algeria
4	Conceptual Design of a Natural Sound Barrier: A Green Solution for Urban Noise Reduction	Piotr Jedrzejczyk, Warsaw University of Life Sciences, Poland
5	Experimental Evaluation of Shear Modulus and Failure Mechanisms in Unidirectional Composite Bars under Torsion	Choubeila BCH Boubechou, University 20 August 1955, Algeria
6	Comparison of tensile and flexural behavior of glass-epoxy and glass-polyester composites	Choubeila BCH Boubechou, University 20 August1955, Algeria Mouadji MY Youcef, National Polytechnic School of Constantine, Algeria Ali AB Bouchoucha, Constantine1 University, Algeria Hamid HZ Zaidi, University of Poitiers, Algeria
7	Development and Characterization of Recycled High-Density Polyethylene/Biochar Biocomposites with Varied Filler Loadings	Amel Mohamed Ben Ali, University of SKIKDA, Algeria
8	Performance enhancement of heat transfer by using biomass carbon nanofluide	Karima boukerma, University of 20 Août 1955 Skikda, Algeria.
9	Geo-Environmental Analysis of Erosion Factors in the Soummam Watershed, North-East Algeria	Salhi Salhi Schahrazed, National Higher School for Hydraulics, Algeria Hamitouche Hamitouche Yasmine, National Higher School for Hydraulics, Algeria
10	Numerical Simulation of the Remineralization of Reverse Osmosis Water	Hachemi Abdelkader, Laboratoire MVRE, Ecole Nationale Superieure d'Hydraulique, Algeria

11	Microstructural and Mechanical Properties of Cu based Alloy Manufactured by Self-Propagating High-Temperature Synthesis Method	Amiour Yacine, University Of 20 Aout 1955 Skikda, Algeria
12	Metaheuristic Optimization of Permanent Magnet Synchronous Machine Design Using Grey Wolf and Teaching–Learning-Based Algorithms	Farouk Boukhenoufa, University of 20 August 1955 Skikda, Algeria Nabil Mezhoud, University of 20 August 1955 Skikda, Algeria Ahmed Bahri, University of Ghardaia, Algeria
13	Enhancing Traceability, Transparency and Environmental Accountability in the Fisheries Sector	Eva Martínez-Ibañez, Cantabria University, Spain Jara Laso, Cantabria University, Spain Ana Fernández Campos, Cantabria University, Spain Maria Margallo, Cantabria University, Spain Ruben Aldaco Garcia, Cantabria University, Spain
14	Enhanced RUL Prediction of Li-ion Batteries Using a Decomposition-Aware Multi-Scale Transformer	Tahar Boukra, University of the 20th August 1955 Skikda, Algeria Smail Bazi, University of Mustafa Benboulaid Batna 2, Algeria
15	Electrical Power Generation in The Algerian Sahara by Solar Energy Combined with a Hydrogen Module using HOMER Pro Software	Adel Miles, University of freres Mentouri, Algeria
16	Recycling of Used Engine Oil Using Solvent Extraction and Acid Treatment	Abdulrauf A. Aboujadeed, Petroleum Research Center, Libya
17	Quantifying the Flexibility Gap in Albania's Power System Under Increasing Solar PV Penetration	Driada Mitrushi, Polytechnic University of Tirana, Albania Valbona Muda, UPT, Polytechnic University of Albania Irma Berdufi, Polytechnic University of Tirana, Albania Urim Buzra, Polytechnic University of Tirana, Albania Joan Jani, Polytechnic University of Tirana, Albania

16:00 – 16:30	**Coffee Break**

18:00 – 18:20	**Closing Ceremony**

07/12/2025, Sunday

09:00 – 18:00	**Historical Istanbul Tour**

ABSTRACT BOOKS

A Novel Approach for Solar Power Generation Using Greenhouse Heating

Bharath Srinivas Srikanth, OTH Amberg-Weiden, Germany
Sriram Kumar, University of Southern California, American Samoa

Abstract

The global population faces a significant challenge in accessing electricity, while the current energy landscape is heading towards the depletion of non-renewable sources in the next decade or two. This emphasizes the need for research focusing on innovative and accessible renewable energy technologies. This study explores the potential of solar power generation through greenhouse heating. By utilizing the thermal gradient between the interior of a greenhouse and its external environment, the proposed system employs thermoelectric generators based on the Seebeck effect principle. The research concentrates on structural design, operational mechanisms, rigorous testing protocols, and a comprehensive feasibility study. These aspects are systematically implemented on a small-scale polycarbonate greenhouse model integrated with thermoelectric generators. This research aims to address the pressing issues of electricity scarcity and nonrenewable resource exhaustion through the development of a practical and cost-effective solar power generation system.

Contribution to Ecofriendly Solar Cells Investigation. Case of Organic Photovoltaic Components.

Rebiha Labbani, University Mentouri of Constantine1, Algeria

Abstract

The photovoltaic solar energy is gaining great attention; it is inexhaustible, clean and produces no harmful impact for the environment. This technology mainly uses semiconductor-based solar cells. Many researchers are motivated to introduce novel semiconductors to replace silicon that produces high efficiency photo diodes but have high production costs. Organic materials are promising because of numerous reasons: low cost, unlimited material, technology at low temperature, supple devices, …. However, their efficiency remains low with respect to silicon-based technology.

In this work, we investigated this kind of organic photovoltaic components in the hope of improving their performance. We studied the output characteristics of organic solar cells by simulation using AMPS-1D open source. The main structure contained an active layer of poly(3-hexylthiophen) (P3HT) and [6-6]-phenyl-C61-butanoate of methyl (PCBM). We considered several parameters, in particular the active layer thickness and temperature. We initially obtained yields around 4.5% only. Subsequently, we improved the efficiencies values when we inserted a tampon layer in the structure. This allowed us to increase the yields up to 5.1%. We note that the last structure contained poly (3,4- ethylendioxythiophen) and poly (styrene sulfonate of sodium) polymers between anode and active layer. The results obtained agreed with literature. As outlook, it is possible to improve further the performance of these cells by paying more attention to parameters directly related to efficiency such as absorption spectrum, charge carrier mobility, defect densities and recombination rates or to use polymers that are more promising.

Mapping Renewable Energy Publications: A Bibliometric Analysis Using RStudio Bibliometric

Yasemin Ozliman Farimaz, Ege University, Izmir Bakircay University, Turkey
Melih Soner Celiktasa, Ege University, Turkey

Abstract

The aim of this paper was to analyze the state-of-the-art research on the publications of renewable energy and some other sub-fields which are related to renewable energy via a bibliometric procedure using the Biblioshinytool. Publications were selected and examined from Scopus database using 36 various keywords in title or topics. The affiliation address has included the word “Turkey”. From the standpoint of expanding trends in the sector, the results were obtained based on the articles released between 2008 and 2024. Outstanding associations, nations, journals, and organizations were introduced. Bibliometric, a component of the R Studio package, was used to assess relevant scientific research retrieved in the SCOPUS database. A total of 2237 publications were examined in one by. It was determined that 2787 authors contributed to these studies. The analysis of the publications, grouped by three main parameters, shows that potential determination leads with 17.14%, followed by policy development at 16.79%. Mathematical modelling & theoretical approaches contribute14.01%, while experimental studies represent 9.57%. The results show that out of all the factors examined new material & design development (2.26%) of the studies had the weakest amount. Considering these data, the scientific study provides the necessary information for further research in the rapidly growing field of renewable energy and its related subfields. When the output obtained from this article is compared with the literature review, it shows the potential for an increase in publications on renewable energy over time and a multifaceted perspective on the subject in the context of its different aspects.

Keywords: Bibliometric analysis, emerging trends, keyword analysis, publications map, renewable energy.

Use of Green-Synthesized Zno Nanoparticles as a Photocatalyst to Degrade a Textile Dye in Aqueous Solution

Tarek Berrama, University of sciences and technology Houari Boumediene, Algeria
Feriel Sahoui, University of sciences and technology Houari Boumediene, Algeria
Lamia Brahmi, University of sciences and technology Houari Boumediene, Algeria
Abdelhalim Balouli, University of sciences and technology Houari Boumediene, Algeria
Mohamed Ait Oumeraci, University of sciences and technology Houari Boumediene, Algeria

Abstract

The aim of this study is to investigate the degradation of textile dye in aqueous solutions, by application an advanced oxidation process (AOP). The pollutant is the basic red 18 (BR18) and the photocatalyst used is zinc oxide nanoparticles of (ZnO-NPs), synthesized by green method. ZnO-NPs were synthesized using Rosmarinus officinalis plant leaf extract and Zn (NO3)2 as precursor under the following conditions: temperature of 70°C, stirring speed of 300 rpm and reaction time of 1.0 h. The crystallization of (NPs-ZnO) was performed at alkaline medium, and the final product was obtained by calcination at 500°C in a tubular furnace. Synthesized ZnO-NPs were characterized by several techniques. DRX analysis showed peaks corresponding to the hexagonal wurtzite structure, while Fourier transform infrared (FTIR) spectroscopy confirmed the presence of ZnO and showed the presence of some carbon functional groups. The degradation tests of BR18 were carried out under UV light in a stirred reactor. The efficiency of the photodegradation of BR18 was evaluated by studying the effect of operating parameters, namely the initial concentration of BR18, the doses of ZnO, and the pH of the solution. The results showed that the degradation yield (discoloration of the aqueous solution) increases as the initial concentration decreases, the ZnO dose increases, and at pH = 6.0. The maximum degradation yield of BR18 (99%) was obtained after 240 minutes of irradiation, corresponding to the following conditions: [BR18]0 = 20 ppm; [ZnO] = 0.4 g. L-1 and pH = 6.0. The study of the degradation kinetics showed that the Langmuir-Hinshelwood model is well followed.

Comparative Study of Photocatalysis and Sonophotocatalysis for Textile Dye Degradation Using MgAl2O4

Mohamed Belmedani, University of Sciences and Technology Houari Boumedienne, Algeria
Asma Hemmi, University of Sciences and Technology Houari Boumedienne, Algeria
El Hadj Mekatel, University of Sciences and Technology Houari Boumedienne, Algeria

Abstract

This work investigates the degradation of the textile dye Rhodamine B using spinel-type MgAl2O4 as a semiconductor catalyst. The MgAl2O4 was chemically synthesized through co-precipitation method and characterized by X-ray diffraction and scanning electron microscopy and FTIR techniques.

For the degradation process, we first performed an adsorption phase in the dark to establish equilibrium, followed by solar irradiation to initiate photocatalysis.

UV-Vi's spectrophotometry was used to monitor the concentration of the textile dye Rhodamine B during the process.

Photocatalysis and sonophotocatalysis were applied to remove Rhodamine B under various operating conditions. Both processes achieved up to 30% degradation efficiency. However, introducing an optimized amount of H2O2 significantly enhanced performance, leading to nearly complete (99%) degradation of Rhodamine B. Mineralization was monitored by total organic carbon (TOC) analysis, revealing that after 4 hours, both processes reached around 40% TOC removal. Over prolonged treatment (32 hours), photocatalysis achieved up to 80% mineralization, whereas sonophotocatalysis reached 93%, highlighting its superior efficiency.

To summarize, MgAl2O4 was successfully synthesized and demonstrated high photocatalytic activity in degrading Rhodamine B under solar irradiation.

The combination of adsorption, photocatalysis and photocatalysis significantly improved the degradation efficiency.
This research highlights the potential of photocatalysis and photocatalysis as a sustainable and green wastewater treatment technology. Moving forward, we aim to apply this process to other pollutants and further optimize it for real-world applications.

Comparing Overnight Depot and Opportunity Charging Strategies for Battery Electric Buses

A. Can Duman, Turkish German University, Turkey

Abstract

Battery electric buses (BEBs) have emerged as a promising alternative to conventional diesel buses, offering zero tailpipe emissions, reduced noise pollution, and lower operating costs. However, the large-scale adoption of BEBs faces practical and economic challenges, primarily due to the trade-offs between battery size, charging infrastructure, and operational efficiency. The choice of charging strategy significantly influences both the technical feasibility and the total cost of ownership of electric bus systems. This study aims to compare two major charging approaches for BEBs, overnight depot charging and opportunity (flash) charging along bus routes, in terms of infrastructure requirements, operational flexibility, and economic performance. The goal is to determine which strategy, or combination thereof, yields the most cost-effective and energy-efficient solution for urban bus fleets. A comparative techno-economic analysis is conducted using realistic operational data, including route lengths, daily duty cycles, and energy consumption per kilometer. The study evaluates each charging strategy under different electricity pricing schemes, such as flat tariffs and time-of-use (TOU) rates. Simulation-based assessments are used to determine the required battery capacity, charger utilization rate, and total energy cost for each scenario. The results reveal distinct trade-offs between the two strategies. Overnight depot charging is operationally simpler and requires less public infrastructure but necessitates larger and more expensive batteries. Opportunity charging, in contrast, allows smaller battery capacities and higher fleet utilization but requires strategically located high-power chargers along routes, leading to higher infrastructure costs. Under TOU tariffs, depot charging benefits from lower off-peak electricity prices, while opportunity charging can better balance charging demand throughout the day. Both approaches can be viable depending on local conditions and operational priorities. Cities with compact routes and high passenger turnover may benefit from opportunity charging, while those with longer routes or limited infrastructure budgets may favor depot charging. The study recommends a hybrid approach that integrates depot and on-route charging to optimize cost, reliability, and energy efficiency in future BEB fleet deployments.

Characterization of Two-Phase Flow Regimes in Hydrophobic Micro-Channels for PEM Fuel Cells

Nouara Ibrahim-Rassoul, University of Sciences and Technology Houari Boumediene USTHB, Algeria
Yacine Salhi, University of Sciences and Technology Houari Boumediene USTHB, Algeria
El-Khider Si-Ahmed, Nantes Université, France

Abstract

An experimental study on two-phase flow under operating conditions like those found in Proton Exchange Membrane Fuel Cells (PEMFCs) was conducted. A dedicated experimental setup was designed to visualize the various two-phase flow regimes that can occur in micro-channels, with the dual objective of gaining deeper insight into the formation mechanisms of two-phase flows and developing models for such complex flow behavior. We experimentally studied air-water flow in 250 × 250 µm² hydrophobic channels, identifying four key regimes: liquid bridge, slug/plug, film, and droplet flow. A significant focus was placed on the dynamics of capillary bridge formation. A key contribution of this work is the development of an automated MATLAB-based image processing algorithm that detects liquid water and classifies its flow structure. This tool quantitatively analyzes the distribution of water among the different identified patterns, providing a powerful method for correlating operational conditions with two-phase flow morphology. This approach advances the quantification of water transport in fuel cell flow fields. It provides insight into key two-phase flow structures and transitions that are critical for effective water management and performance in PEMFC channels.

Keywords—Fuel cells, clean energy, mini channels, two phase flows.

Proposing a Novel Solar-Driven Hybrid System for Water, Cooling, and Power Production

Mahdi Deymi-Dashtebayaz, Hakim Sabzevari University, Iran

Abstract

To address the concurrent global challenges of freshwater scarcity and growing energy demand, this study introduces an advanced hybrid system capable of simultaneous freshwater generation, space cooling, and power production. The proposed system synergistically integrates a Multi-Stage Flash (MSF) desalination unit, an indirect evaporative cooling mechanism based on the Maisotsenko Cycle (M-Cycle), an Organic Rankine Cycle (ORC), and parabolic trough solar collectors (PTCs). Within the system, the M-Cycle cools ambient air, which is then used to pre-cool the seawater before it enters the MSF unit, thereby enhancing evaporation potential. Simultaneously, thermal energy harvested by the solar collectors is transferred via a closed-loop heat transfer fluid to support both the MSF and ORC subsystems. Exergy analysis and thermodynamic modeling indicate that the proposed configuration increases the gain output ratio (GOR) to 1.32 and enhances freshwater production by 22.8% relative to a conventional MSF system. Incorporation of the Maisotsenko cycle (M-Cycle) provides 39755, sufficient to meet the cooling demand of an office area of 120 m² within the complex. Following multi-objective optimization, the total annual cost (TAC) of this innovative water–cooling–power tri-generation system is estimated at USD 14.4 million per year. To determine the most effective operational regime, a multi-objective optimization was conducted using the TOPSIS decision-making method. Results confirm that factors such as air flow rate, inlet seawater temperature, and operating pressure significantly influence thermal efficiency, exergy destruction, and economic performance. This integrated solution presents a viable and sustainable approach for arid and semi-arid regions, enabling efficient resource utilization while addressing the interconnected demands of water and energy.

Recycling of Used Engine Oil Using Solvent Extraction and Acid Treatment

Abdulrauf A. Aboujadeed, Petroleum Research Center, Libya

Abstract

Recycling used oil is a challenging and attractive method of oil conservation and environmental protection. The refining of used lubricating oil can minimize the dependence on virgin base oil to produce more valuable products and can prevent pollution. Optimizing the recycling of used oil is an important goal toward improving sustainability and reducing the environmental impact of our needs.

In Libya, thousands of tons of vehicle waste oils are generated every year, most of these oils are wasted because no suitable disposal route exists and no special regulations for the collection and there are no procedures to process or recycle used oils. About 50-60% of these oils are exported abroad and the rest is disposed of water drains, gutters, open plots and farms, this leads to pollution of streams and ground water. Regeneration of waste oil and associated products markets should be patronized by the government.

The objective of re-refining is to remove the degraded additives and contaminants and to restore the properties of the oil identical to the standards provided by SAE (Society of Automotive Engineers.).

Different recycling techniques have been proposed for reining used lubricating oils. The refining process involves the removal of contaminants and dirt by distillation, acid treatment, solvent extraction, clay treatment, hydrogenation, or combination of these processes. The refined oil produced by these methods has different properties and operational cost.

In this work two different methods have been used by acid treatment and solvent extraction. The performance of the solvent extraction method is evaluated against that of acid treatment. The yield of base oil using solvent extraction is about 55.0-55.3% more compared to acid treatment. Thus, for a given separation task, solvent extraction is more environmentally friendly and economic feasibility.

Keywords: Re-recycling used lube oil, Acid treatment, Solvent extraction and Operating cost.

Assessment of Foreign Langauge Learning at High (Secondary) School and University levels In Terms of CEFR Standards

Mehmet Temur, Inonu University, Turkey

Abstract

This study aims to assess the perception of students' foreign language learning skills in terms of CEFR's descriptors in the twelfth grade at high school and in the first grade at university level. This research was conducted within survey researching model. Research's glob was constituted of students studying in the twelfth grade of high school and in the first grade of university in Malatya/Türkiye the sample was consisted of 795 students selected from this universe was based on the easy sampling method. 392 of those students were students who were studying in different programs at Inonu University, and 403 of those were from high school in Malatya Province. Apart from that, the instructors and teachers who conduct the English classes at Inonu University and the High schools affiliated to the Ministry of National Education were asked to evaluate students' perceptions regarding English Language Learning in terms of the items in the data collection tool. As a research data collection tool, the questionnaire constructed within scope of CEFR 's standard descriptions (Common European Framework of References for Languages) were chosen to be implemented.

European Language Portfolio (ELP), including 221 questionnaire items, was developed by leading of European Council's Language Policies Unit for the purpose of language learners to do self-assessment about their language learning progress independently. In the study, numbers and percentages were used as descriptive statistical methods in the evaluation of the data obtained. Differences between the ratios of categorical variables in independent groups were analyzed through Chi-square and Fisher exact tests.

According to the findings obtained because of the research, the language level of the majority in both groups; high school and university students were found at and below A1. The rate of those with language level below A2 was higher in university students, and the rate of those with the language level below C2 was higher in high school students, another significant finding of research 's result indicates that woman students' language level is higher than those of boy students'. Ones whose rate of language level was below A1 was found high among boy students. Ones whose language level was below C2 was higher in woman students. The language levels of the students differed significantly according to both teachers and students' perceptions. According to the teachers' language perceived rate that was below A1 was found high in high school students, but the rate that was below B2 was found higher in university students. The rate of that whose teacher's perceived language level was below C1 was high among university students. The fact that the students forming the sample were not at the expected level in terms of CEFR levels is that necessitates the revision of the Ministry of National Education (MNE) curriculum. The fact that the students' langauge achievement rates being observed mostly at A1 and below A1 levels, which occurred for both student groups in different institutions high school and university, revealed that there is an inadequacy of language teaching education in university (tertiary) educational programs as well precedent Ing high (secondary) school educational progresses.

As a result, it is suggested that language education at secondary and higher (tertiary) education levels should be restructured in a way including curriculum and teaching processes that would provide a solution to this matter.

Key words: English Language Teaching, CEFR, Common European Framework of References for Languages, University Students

Intelligent Control Based on Machine Learning of Energy Sharing in Wind-Based Microgrids

Aymen Bamaarouf, Electrical engineering, Morocco

Abstract:

The global energy transition promotes the development of microgrids integrating renewable sources such as wind energy. However, the intermittency of these sources creates challenges in terms of stability, synchronization, and optimal energy flow management. This research proposes an artificial intelligence-based approach to optimize control, synchronization, and energy sharing among distributed units within a microgrid connected to the national grid. The methodology relies on reinforcement of learning algorithms and neural networks to dynamically adjust control parameters according to load conditions and generation fluctuations. Preliminary simulation results show a significant improvement in system stability and a reduction in energy losses. Furthermore, the proposed model can be adapted to different configurations of distributed generation systems, ensuring flexibility and scalability for real applications. Future work will focus on experimental validation through a laboratory-scale microgrid platform integrating real-time data acquisition and hardware-in-the-loop simulation. This step aims to confirm the robustness and adaptability of the proposed intelligent control under realistic operating conditions, paving the way toward autonomous and resilient smart energy systems.

These findings highlight the potential of intelligent control strategies for enhancing the integration of renewable sources in modern smart grids.

Keywords: Microgrid, wind energy, optimization, synchronization, Machine Learning

Investigating the Pressure Distribution of an Airfoil with a Cylindrical Body

Mohammad Hossein Ghadimi Gorakhk, Malek Ashtar University of Technology, Iran.
Abdolamir Bak Khoshnevis, Hakim Sabzevary University, Iran

Abstract

A cylinder on an airfoil's leading edge modifies the flow field, increasing lift and delaying stall by energizing the boundary layer and creating vortices. This application is used in renewable energy, such as wind turbines, to increase their power coefficient by enhancing the aerodynamic performance of the blades. Airfoil-cylinder model is also one of the most interesting topics for researchers in the world, and many studies and results have been obtained in this field. In the present study, the airfoil-cylinder model is used to evaluate the effect of roughness on the pressure distribution of the airfoil. The Sandpaper for roughness is wrapped around a circular cylinder and is examined at four different distances 0.25C, 0.5C, 0.75C and C from the airfoil. The experiment was conducted in a subsonic, open-circuit and suction type wind tunnel with a test section of 110×120 cm and at two velocities of 25 and 40 m/s. The pressure coefficient graphs for the upper and lower surfaces of the airfoil are plotted and compared at all distances and velocities. The pressure measuring device is a digital manometer with the brand name Testo 510i. Finally, it is understood that by adding roughness to the cylinder, the pressure coefficient values ??have been reduced. Increasing the distance of the cylinder from the airfoil reduces the changes and disturbances caused by the cylinder, and as a result, the change in roughness also has less effect on the pressure distribution. Increasing the distance of the cylinder from the airfoil reduces the effect of its presence and makes the changes due to roughness less significant. In most cases, the pressure distribution on the upper and lower surface of the airfoil is different, and although the angle of attack is zero, the turbulent flow after the cylinder hits the airfoil asymmetrically and non-uniformly and does not have the same effect on the two surfaces of the airfoil.

Uncovering Drivers of Political Resistance to the Phase-Out of Russian Fossil Fuels in Europe: Mapping Narratives, Dependencies, Financial Influence

Ivan Hortal Sanchez, Belgium

Abstract

Problem Statement

Despite the EU's commitment under REPowerEU to eliminate dependence on Russian fossil fuels following the 2022 full-scale invasion of Ukraine, significant political and economic resistance persists. While EU pipeline gas imports from Russia have dropped dramatically, LNG imports increased by 7% in early 2025, generating over €3 billion from April to September 2025 alone. This continued trade undermines the EU's energy security objectives, climate commitments under the European Green Deal, and efforts to economically isolate Russia. The persistence of Russian energy flows reveals systematic influence networks involving corporate interests, political actors, and financial dependencies that obstruct the transition away from Russian fossil fuels.

Purpose of the Study

This research identifies and maps the channels through which Russian energy interests maintain influence over the European energy policy, examining corporate networks, financial flows, lobbying infrastructure, and narrative manipulation. The study aims to expose the mechanisms enabling continued Russian fossil fuel dependency and provide actionable policy recommendations for strengthening the EU's energy independence and countering foreign influence operations.

Methods

The analysis employs multi-method research including documentary analysis of corporate relationships, ownership structures, and contractual agreements; tracking of financial flows between Russian energy entities and European companies, think tanks, and political figures; case study examination of five strategically important countries (Austria, Cyprus, Romania, Malta, Turkey); mapping of lobbying networks and revolving door appointments.

Findings and Results

The research documents extensive Russian influence infrastructure across Europe. Several major EU political parties received Russian energy sector financing, including Austria's FPÖ, France's National Rally, and Germany's AfD. European companies —TotalEnergies, SEFE, Naturgy, and Fluxys— collectively contributed approximately $5.2 billion to Russian tax revenues through Yamal LNG contracts between 2022-2024. The shadow fleet comprising over 1,000 vessels generated €22 billion in above-cap revenues for Russia. Former senior officials including Gerhard Schröder, François Fillon, and Karin Kneissl secured positions with Russian energy firms, creating revolving-door conflicts. Russian-funded think tanks and foundations systematically promoted narratives framing gas as an "inevitable bridge fuel" while undermining renewable energy alternatives. In the light of COP31, which Turkey will host in 2026, the upcoming December 2025 renegotiation of the 21.75 bcm annual gas supply agreement with Gazprom will determine whether Turkey continues its successful diversification trajectory or becomes more vulnerable to Russian energy coercion.

Conclusions and Recommendations

Russian energy influence operates through interconnected corporate, financial, and political networks that exploit regulatory gaps and jurisdictional fragmentation. To counter these operations, the EU must: (1) establish an EU-wide Foreign Fossil Influence Registry requiring comprehensive disclosure of financial relationships, ownership stakes, and lobbying activities; (2) expand sanctions comprehensively on Novatek, its subsidiaries, and affiliated persons to close LNG sanctions loopholes; (3) strengthen cooperation with Ukraine and civil society watchdogs through joint intelligence sharing, funding for independent energy research, and early warning systems against disinformation.

Digital Sequence Information (DSI) and the Nagoya Protocol: Update, Ambiguities, Challenges and Regulatory Gaps

Pascale Joseph, France

Abstract

Digital Sequence Information (DSI) has emerged as a critical issue under the Nagoya Protocol, which is part of the Convention on Biological Diversity (CBD). The protocol aims to ensure fair and equitable sharing of benefits arising from the utilization of genetic resources. However, the rise of DSI—genetic information in digital form—has created significant regulatory and conceptual challenges, raising questions about its inclusion under the Nagoya framework. This article addresses the last main point decision adopted during the 16th meeting of the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) on DSI which held in Cali, Colombia, from October 21 to November 1, 2024, as well as issues, regulatory challenges and points requiring clarification.

Quantifying the Flexibility Gap in Albania's Power System Under Increasing Solar PV Penetration

Driada Mitrushi, Polytechnic University of Tirana, Albania
Valbona Muda, UPT, Polytechnic University of Albania
Irma Berdufi, Polytechnic University of Tirana, Albania
Urim Buzra, Polytechnic University of Tirana, Albania
Joan Jani, Polytechnic University of Tirana, Albania

Abstract

Albania is rapidly expanding its utility-scale solar photovoltaic (PV) capacity, with major developments such as the 140 MW Karavasta and 100 MW Spitalla plants coming online alongside a growing portfolio of new installations. Recent data indicate that in 2024, solar PV plants generated approximately 0.49 TWh, contributing about 6% of Albania's domestic electricity production. While this rising PV enhances energy diversification and reduces reliance on imports, its effective utilization depends on the power system's ability to manage fast variations in net load.

This study provides the first quantitative assessment of whether large-scale solar PV can be integrated efficiently and reliably into Albania's hydro-dominated power system. Hourly load data are combined with reanalysis-based solar generation profiles to construct representative PV time series. Net-load trajectories are calculated by subtracting PV output from total demand, and hourly upward and downward ramp rates are derived to quantify short-term flexibility requirements. The flexibility gap—defined as the portion of ramping that exceeds the inferred short-term flexibility of the hydropower fleet—is used as the central indicator of operational feasibility.

Results show that Albania can integrate moderate PV penetration without significant operational challenges, but the effective use of large-scale PV becomes increasingly constrained by steep evening upward ramps (17:00–20:00) and rapid morning downward ramps on high-irradiance days. As total PV capacity rises to several hundred megawatts, ramping frequently approaches or surpasses available hydro flexibility. These findings indicate that Albania can utilize large volumes of PV effectively only with complementary measures, including improved hydropower scheduling, regional balancing, demand-side response, and future storage deployment.

Keywords: Solar PV integration; flexibility gap; hydropower flexibility; net-load ramping; renewable penetration; operational feasibility.

Investigation of Optical Spots Formed on the Photo matrix Surface by Continuous Optical Radiation Propagating Through an Optical Fiber

Mehtiyev Ali, Kazakhstan Institute of Standardization and Metrology, Kazakhstan
Alkina Aliya, Kazakhstan Institute of Standardization and Metrology, Kazakhstan

Abstract

The operating principle of the HSS is based on intelligent opto-digital analysis of the parameters of an optical spot projected onto the surface of a high-resolution photo matrix, followed by analysis of changes in the amplitude and intensity of the optical wave. Figure 1 presents a visualization of the optical spot intensity, its key characteristics, and the influence of additional optical losses caused by micro-bending in the optical fiber.

Comparative assessment of different faults impact on photovoltaic array based serial / parallel configuration

Ahmed Mohammedi, University of Bejaia, Algeria
Abdelaziz Zerglaine, University of Chlef, Algeria
Nasser Eddine Mebarki, University of Bejaia, Algeria
Rachid Taleb, University of Chlef, Algeria

Abstract

Fault analysis in photovoltaic arrays plays an important role in enhancing the safety, reliability, and efficiency of PV systems. Faults not only degrade energy output but also lead to severe operational failures. The performance of a PV array is significantly affected by factors such as PV technology, system configuration, and environmental conditions. Therefore, a thorough fault analysis must consider the impact of different PV configurations to develop effective fault detection and mitigation strategies. This paper presents a comprehensive investigation of various PV faults, including partial shading; short-circuit faults, and open-circuit faults, across different PV interconnection topologies, with a focus on the Series-Parallel (SP) configuration. The study is conducted using MATLAB/Simulink simulations and the obtained power (P) - voltage (V) characteristics are compared and analyzed to provide valuable insights into fault detection and system optimization.