

Energy Fuels Environment EFE 2024

June 26-28, 2024

AGH University of Krakow, Kraków, Poland

Conference Program

Wednesday, June 26, 2024

08:00 - 09:00 Registration (Building D4)

09:00 Welcome - Introduction (Building D4, room 8-9)

09:15 - 10:30 Environmental Session (Building D4, room 8-9)

Coordinator: Katarzyna Styszko

Chairman: Katarzyna Styszko

09:15 Wojciech Lipiński - Advances in solar thermal power and chemistry

09:45 Verónica de Zea Bermudez - New Energy Materials for Smart Windows in Smart Cities and Green Mobility

10:00 Anna Ryś - Characterization of Particulate Matter and Identification of Pollution Sources in Krakow

10:15 Rakshit Jakhar - Oxidative Potential of PM1, PM2.5, and PM10 Collected in Road and Tram Tunnels in Krakow, Poland

10:30 - 11:00 Coffee Break (Building D4, room 12, corridor)

11:00 - 12:45 Environmental Session (Building D4, room 8-9)

Coordinator: Katarzyna Styszko

Chairman: Katarzyna Styszko

11:00 Andrzej Adamski - From Waste to Functional Materials: Valorization of Fly Ashes from the Energy Sector

11:15 Xymena Badura - Assessment of Process Water Tendency to Generate Fouling Deposits on Heat Exchangers

11:30 Dorota Makowska - Volatility of Certain Ecotoxic Elements During Combustion of Various Wastewater Sludge

11:45 Jakub Mokrzycki - The Effect of Copper(II) Salt Precursors on HKUST-1 Physicochemical Properties and Removal of Trivalent Chromium Ions from Aqueous Solutions

12:00 Justyna Pyssa - Assessment of Eutrophication Potential Reduction Based on Physicochemical Tests of Municipal Wastewater from the Płaszów Wastewater Treatment Plant

12:15 Tadeusz Żaba - Utilization of Waste Heat in the Thermal Treatment of Sewage Sludge (Wykorzystanie ciepła odpadowego w procesie termicznej utylizacji osadów ściekowych)

12:30 Monika Rydygier - Selected Environmental Challenges in the Development of Offshore Wind Energy in the Baltic Sea

12:45 Michał Rejda - Bio-coke for Ferroalloys Production Process

12:45 - 14:15 Lunch - Restaurant Krakus, ul. Reymonta 15, Kraków

14:15 - 16:00 Catalysis in Fuel Industry (Building D4, room 8-9)
Coordinators: Monika Motak, Marek Inger, Marek Lewandowski
Chairman: Marek Inger, Marek Lewandowski

14:15 Michał Mareczek - Hydrogen used as fuel for combustion engines

14:45 Agnieszka M. Ruppert - Fine-tuned ruthenium catalyst for synthesis of biomass derived furanic - type biofuels

15:15 Jacek Grams - Competitive catalysts for hydrogen-rich gas production via co-pyrolysis of lignocellulosic biomass and plastic

15:30 Piotr Legutko - Redox-metal-doped potassium glasses for catalytic soot abatement

15:45 Paweł Kowalik - Novel water-gas shift catalyst for lean steam to gas ratio applications

16:00 - 16:30 Coffee Break (Building D4, room 12, corridor)

16:30 - 18:15 Analityka przemysłowa i środowiskowa – Sesja Jubileuszowa Profesora Janusza Gołasia (Professor Janusz Gołaś Jubilee Session – session in Polish) (Building D4, room 8-9) *(in Polish)*
Chairman: Jerzy Górecki

16:30 Welcome - Monika Motak, Dean of the Faculty of Energy and Fuels

- 16:40** Janusz Gołaś - Silva Rerum - różności z życia Janusza Gołasia.
- 16:55** Bogusław Baś - Woltamperometria w układach ekstremalnie wysokich ciśnień i znacznie więcej...
- 17:10** Barbara Kubica - Określenie poziomu sztucznego radionuklidu ^{137}Cs i naturalnego ^{40}K w glebach pobranych z terenu Tatr.
- 17:25** Janusz Supernak - Moja współpraca z Profesorem Gołasiem: wzorowe partnerstwo i wieloletnia przyjaźń
- 17:35** Mariusz Macherzyński - Badania substancji zanieczyszczających środowisko i ich poziomy w wodach i osadach dennych.
- 17:45** Jerzy Górecki - Środowiskowe i przemysłowe pomiary rtęci.
- 17:55** Katarzyna Nosek - Farmaceutyki i produkty ich przemian w środowisku wodnym – pochodzenie, losy, występowanie i toksyczność.
- 18:05** Katarzyna Szramowiat-Sala - Nauka o danych oparta na sztucznej inteligencji: nowe podejście do identyfikowania trendów i zależności w procesach środowiskowych.

19:00 Social event - Concert by Krakow Opera Musicians at the Manggha Museum of Japanese Art and Technology, Konopnicka 26, Kraków.

Thursday, June 26, 2024

08:30 - 19:00 - Poster Session (Building D4, 1st floor, corridor)

11:00 - 18:00 - Presentation of the **hydrogen bus** parking next to the U-2 building (Main Library)

08:45 - 11:30 Energy Policy Markets and Economics (Building D4, room 8-9)

Coordinators: Artur Wyrwa

Chairman: Artur Wyrwa

08:45 Waldemar Kamrat - The multi-criteria method of investing effectiveness evaluation for modern energy supply systems sustainable development modelling

09:00 Evren Unsal - Shell Research Alliance

09:15 Wojciech Graczyk - From coal & gas company to the supplier of energy transition. E.ON turnaround in Europe and Poland

09:30 Dimitrios Glynos - Germany's Delayed Nuclear Phase-Out: Insights from the 2022/23 Energy Crisis

09:45 Dorota Jeziorowska - Impact of the EU „Fit for 55” package on the transformation of the district heating sector in Poland - key conclusions, costs and directions

10:00 Piotr Kleinschmidt - Low-temperature heating networks: how to fully utilize the potential of district heating

10:15 Maciej Raczyński - Cross-sectoral modelling approach to design energy transition and decarbonisation pathways for district heating systems

10:30 - 11:00 Coffee Break (Building D4, room 12, corridor)

11:00 Hendrik Scharf, Maximilian Happach - Transition of Energy-Intensive Industries and Regionalization of their Hydrogen Demand

11:15 Atif Khan - Forecasting Sectoral Electricity Consumption in the Selected EU Countries: A Comparative Analysis of Time Series Models

11:30 - 13:00 Nuclear Energy and Modern Approaches and Innovations of Energy Equipment (Building D4, room 8-9)

Coordinators: Paweł Gajda, Katarzyna Szarłowicz, Piotr Dzierwa, Marcin Trojan

Chairman: Katarzyna Szarłowicz

11.30 Andrzej Chmielewski - Polish Nuclear Energy Program vs. Energy Transformation

12.00 Tomasz Bury - Overall safety evaluation of a nuclear retrofit based on generation III/III+ nuclear reactor - case study

12.15 Tomasz Bury - Efficiency of a nuclear fuel utilization for contemporary and future nuclear reactor technologies

12.30 Mikołaj Oettingen - Comparison of nuclear fuel mass balances for small modular reactors and large-scale reactors

12.45 Kamil Zawicki - Legal conditions for the storage of radioactive waste and spent nuclear fuel in the light of the European renaissance of nuclear energy. Comparative approach: Poland, EU, World

13.00 Michał Rybiński - Prediction of wind turbine productivity as a necessity for proper maintenance planning

13:25 - 14:30 Lunch - Restaurant Krakus, ul. Reymonta 15, Kraków

14:30 - 16:00 Hydrogen Session (Building D4, room 8-9)

Coordinator: Magdalena Dudek

Chairman: Magdalena Dudek, Krzysztof Badyda

14:30 Sushant Satputaley – Biofuel and Hydrogen as an Sustainable Alternative Fuel for I.C. Engine

15:00 Krzysztof Badyda - Where does hydrogen come from?

15:15 Adam Smoliński - The role of the mineral industry in the energy transition and green hydrogen energy economy

15:30 Ziemowit Pliszewski, Kazimierz Fudala - Plans and assumptions for the implementation of hydrogen buses at MPK S.A. in Kraków

15:45 Renata Cicha-Szot - Laboratory studies of salt rocks to assess the feasibility of large-scale hydrogen storage in salt caverns

16:00 - 16:30 Coffee Break (Building D4, room 12, corridor)

16:30 - 19:00 Hydrogen Session **parallel** (Building D4, room 8-9)

Coordinator: Magdalena Dudek

Chairman: Maria Sozańska, Andrzej Raźniak

16:30 Bartosz Adamczyk - Biohydrogen and alternative fuels for solid oxide fuel cells

16:45 Katarzyna Stec - Hydrogen as a zero-emission fuel - an opportunity for energy-intensive industries

17:00 Adam Tatarczuk - Pilot research on CO₂ hydrogenation process for E-methane and E-methanol

17:15 Maria Sozańska - Positive effect of high - temperature hydrogen treatment in titanium alloy

17:30 Andrzej Budziak - Analysis of hydrogen sorption capacity of LaNi₄Al_xSn_{1-x} system

17:45 Szymon Kuczyński - Research on material properties and use of composite tanks manufacturing technology for compressed hydrogen storage

18: 00 Rafał Iwaniak, Tim Lorenz - Hydrogen compressors for vehicle hydrogen refueling stations - SERA and Hennlich experience

18: 15 Mikołaj Zarzycki - Hybrid energy sources using hydrogen and fuel cells in mobile robotics

18:30 Katarzyna Gdowska - Hydrogen Refueling Station Location in Railway Network – Strategic Management Perspective

18:45 Magdalena Dudek - Energy efficiency and economy analysis of an extended range unit involving a polymer exchange membrane fuel cell stack

16:30 - 19:00 Hydrogen Session parallel (Building D4, room 101)

Chairman: Kun Zheng, Gábor P. Szijjártó

16:30 Gábor P. Szijjártó - Challenges and opportunities in the development of proton exchange membrane fuel cells (PEMFCs)

16:45 Manhal Al-Mashhadani - Effective fluorine-free blend membranes made from sulfonated Polyvinyl Alcohol (S-PVA) and PEBAX 1657 with Titanium dioxide sulphate TiO_2SO_4 as Nano filler: exploring the impact of various filler ratios on PEMFC applications

17:00 Kun Zheng - Designing high-performance dual-phase hybrid electrodes for Solid Oxide Cells: the excellence of synergistic effects

17:15 Fangjun Jin - Investigation of the properties of cathode materials with a double perovskite structure under the synergistic influence of defects and bismuth ions

17:30 Piotr Winiarz - Tailoring negative thermal expansion coefficient materials for SOFC composite cathode with improved performance

17:45 Jakub Lach - Tuning in situ exsolution of nanocatalysts in defect engineered double perovskites for Symmetrical Solid Oxide Cells

18:00 Muhammad Bilal Hanif - Boosting the electrochemical performance of oxygen electrodes via the formation of LSCF-BaCe_{0.9-x}Mo_xY_{0.1}O_{3-δ} triple conducting composite for solid oxide fuel cells

18:15 Michał Gogacz - A-site defect modulation in perovskites for designing high-performance nanofiber electrodes with *in situ* exsolution of nanoparticles for symmetrical SOFCs

18:30 Amir Sultan - Design of efficient and durable symmetrical protonic ceramic fuel cells at intermediate temperatures via B-site doping of Ni in BaCe_{0.56}Zr_{0.2}Ni_{0.04}Y_{0.2}O_{3-δ}

Friday, June 28, 2024**08:30 - 10:30 Energy Technologies (Building D4, room 8-9)**

Coordinator: Karol Sztekler

Chairman: Karol Sztekler

08:30 Tadeusz Dziok - Assessment of the possibility of upgrading waste biomass derived from tree leaves and needles in the washing process

08:45 Mateusz Marcinkowski - Optimizing Heat Transfer Predictions in Plate Fin and Tube Heat Exchangers Using Artificial Neural Networks

09:00 Jan Markowski - Optimizing Microgrid Energy Management with micro-scale Compressed Air Energy Storage

09:15 Łukasz Lasek - The heat and mass transfer intensification methods: fluidization and micro/nano bubbles - achievements and concepts

09:30 Artur Harutyunyan - General overview of hydrogen technology and utilization its in gas turbines

09:45 Aleksandra Roszko - Heat transfer intensity in the magnetic field dependence on a type of nanofluid

10:00 Maciej S. Siekierski - Role of medium temperature protonic conductors in Power-to-X ecosystem.

10:15 Patryk Marczak - Investigation of a two-phase air-water mixture using CFD and radiometric method analysis

10.30 Bogumiła Hajdrowska, Wirginia Krzyściak - Łatwiej zapobiegać niż leczyć

10:40 Closing session

10:45 - 11:15 Coffee Break (Building D4, room 12, corridor)

11:15 - 13:00 Sesja Jubileuszowa – 50-lecie Wydziału Energetyki i Paliw *Jubilee Session – 50th Anniversary of the Faculty of Energy and Fuels* (in Polish)

13:00 - 14:15 Lunch Restaurant Krakus, ul. Reymonta 15, Kraków

14:30 - 16:00 Sesja Jubileuszowa Prof. Wojciecha Suwały *Prof. Wojciech Suwała Jubilee Session* (Building D4, room 8-9, corridor) *Fuels* (in Polish)

Koordynator: Artur Wyrwa

Chairman: Artur Wyrwa

14:30 - 16:00 Mikrosymposium (Budynek B3, sala 320) (in Polish)

Koordynator: Piotr Burmistrz

Chairman: Piotr Burmistrz

18:00 - 18:15 Departure of Buses to Grajów (Banquet Venue) / *Odjazd autokarów do Grajowa*

The square near the AGH Main Library, between buildings A2 and A3, with entrance from Reymont Street 7.

Plac przy Bibliotece Głównej - między budynkami A2 i A3, wjazd od ul. Reymonta 7

19:30 Conference Banquet - Folwark Zalesie, Grajów near Wieliczka