



2nd FERIA CONFERENCE

PROGRAMME

**THE FUEL AND ENERGY RESEARCH FORUM'S EUROPEAN
CONFERENCE ON FUEL AND ENERGY RESEARCH
AND ITS APPLICATIONS**

MONDAY 4th TO WEDNESDAY 6th SEPTEMBER 2023



The Edge Conference Centre, University of Sheffield, Sheffield, UK
Endcliffe Village, 34 Endcliffe Crescent, Sheffield S10 3ED

Monday 4th September 2023

Opening Session: The Edge, Hi Tor 2, 09.10–9.55

- 08.30 Arrival and registration (reception area)
- 09.10 *Opening address:* Prof Bill Nimmo, 2nd FERIA Conference Chairman.
- 09.15 *Welcome address:* Prof John Flint, Deputy VP Research, University of Sheffield, UK
- 09.25 *Keynote address: ‘CCS deployment: getting it to work more-or-less as planned with respect to timing, performance and budgets - and the pay-off’*
Prof Jon Gibbins, Director of UKCCSRC, University of Sheffield.

Session 1A – The Translational Energy Research Centre: The Edge, Hi Tor 2, 10.00-11.20

Session Chair: Dr Janos Szuhanski

- 10.00 *Demonstration of CO₂ capture from Waste to Energy at TERC*
Muhammad Akram, University of Sheffield, UK
- 10.20 *The Study of Chemical Interactions at the Secondary Phase of Aviation Fuel Surface Deposition: Combining Ab-initio Density Functional Theory with Experimental Analysis*
Rahima Babayeva, University Energy Institute, University of Sheffield, UK
- 10.40 *Woody Biomass Combustion with Kaolin Injection Affects Reduction of The Fly Ash Deposits in 240kW Grate Boiler*
Nik Nor Aznizam, University of Sheffield, UK.
- 11.00 *Accelerated Solvent Degradation tests at TERC Capture plant*
Muhammad Akram, University of Sheffield, UK.

Session 1B - Hydrogen/Ammonia 1: The Edge, Hi Tor 3, 10.00-11.20

Session Chair: Dr Ali Nabavi

- 10.00 *Experimental study of coal/ammonia co-firing using single burner system*
Taeyoung Chae, Korea Institute of Industrial Technology, S Korea.
- 10.20 *Design of a Monolithic Nickel-based Catalyst for Hydrogen Production*
Ziqi Chen, Cranfield University, Cranfield, UK.
- 10.40 *A Simulation Study on the co-production of Hydrogen and Carbon Nanotube from the co-gasification of Waste Tyre and Waste Biomass*
Bilainu Oboirien, Department of Chemical Engineering, University of Johannesburg, SA.
- 11.00 *tbc*

Session 1C - Anaerobic Digestion: The Edge, Hi Tor 4, 10.00-11.20

Session Chair: Dr Davide Poggio

- 10.00 *A Discussion: How should we classify anaerobic digestion of wastes and the consequences of our answer.*
David Newman, Chair of the European Bioeconomy Bureau in Brussels; Managing Director of the BIA in the UK; former Executive Director of Greenpeace Italy 1995-97.

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- 10.20 *Biowaste to biochar: Hydrothermal carbonisation & high temperature torrefaction of food waste anaerobic digestate*
Colin Snape, University of Nottingham.
- 10.40 *Experimental evaluation of biochar effects on anaerobic digestion of food waste and biomethanation of hydrogen*
Wenjun Peng, University of Sheffield, UK.
- 11.00 tbc

Tea/Coffee Break 11.20 – 11.45

Session 2A – China : Clean Energy Research 1: The Edge, Hi Tor 2, 11.45–13.05

Session Chair: Prof Meihong Wang

- 11.45 *Comparative Evaluation of CO₂ and Steam in Pyrolysis/Gasification of Waste Tyre and Biomass for Syngas Production through Process Simulation and Optimisation*
Fahima Al Balushi, CBE, University of Sheffield, UK.
- 12.05 *Mutual Perception based Integrated Scheduling and Control of Off-Grid Multiple Energy System*
Yuhui Jin, National Engineering Research Center of Power Generation Control and Safety, School of Energy and Environment, Southeast University, China.
- 12.25 *Coordinated Control of Multiple Energy System using Model Predictive Control with Non-uniform Prediction Step and Asynchronous Optimization*
Xin Xiong, National Engineering Research Center of Power Generation Control and Safety, School of Energy and Environment, Southeast University, China.
- 12.45 *Analysis and Evaluation of the Multiple Energy Flows Irreversible Loss Formation Mechanism in Integrated Energy Systems Based on the Classification of Exergy Flow Attributes,*
Sha Liu, Jingling Institute of Technology, Nanjing, China.

Session 2B - Gasification/Pyrolysis 1: The Edge, Hi Tor 3, 11.45–13.05

Session Chair: Dr Gang Lu

- 11.45 *The influence of structural properties of biochar on CO₂ gasification reactivity in macro-thermogravimetric reactor*
Ahmed Alsawadi, University of Cardiff, UK
- 12.05 *Co-Pyrolysis-Plasma of Waste Biomass-Polystyrene for Liquid Fuel and Chemical Production*
Maryam Khatibi, University of Leeds, UK
- 12.25 *Enhancing Hydrogen Production through Two-Step Wood and RDF Pellets Gasification with CO₂-Steam as Gasifying Agent: An Optimization Study*
Jirat Mankasem, Newcastle University, UK
- 12.45 *Valorisation of Municipal Solid Waste for co-firing with coal*
Bijal Gudka, University of Leeds, UK

Session 2C – Fuel Cells: The Edge, Hi Tor 4, 11.45–13.05

Session Chair: Dr Orla Williams

- 11.45 *Patterned Hydrophobic Gas Diffusion Layers for Polymer Electrolyte Fuel Cells*
Fatma Calili Cankir, University of Sheffield.
- 12.05 *Characterisations of Double Sided Graphene Based Microporous Layer Coated Gas Diffusion Layers for the Improved Performance of Polymer Electrolyte Membrane Fuel Cells*
Fernando Ruscillo, University of Sheffield.
- 12.25 *Influence of the non-uniform catalyst structure on PEM fuel cell performance investigated by a multi-scale model*
Jinbei Tian, University of Sheffield.
- 12.45 tbc

Lunch 13.05 – 14.20

Session 3A – Biomass/Waste 1: The Edge, Hi Tor 2, 14.20–16.00

Session Chair: Dr Abby Samson

- 14.20 *Global status of bioenergy with carbon capture, BECCS*
Jenny M Jones, University of Leeds, UK
- 14.40 *A Lab-Based Technique for Assessing the Longevity of Industrially Used and New Filtration Media from Biomass Combustion Sites*
Peter Cole, University of Sheffield.
- 15.00 *Whisky Distillery and Barley Biomass Waste Potential for Whisky Distillery Decarbonisation*
Gordon Andrews, University of Leeds, UK
- 15.20 *An overview of biomass utilisation in chemical looping - the good, the bad and the ugly*
Fatih Gulec, University of Nottingham, UK
- 15.40 *A Novel Biomass Drying Strategy with Combined Pasteurisation and Natural Drying*
Ho Lau, University of Nottingham, UK

Session 3B – Green Processes 1: The Edge, Hi Tor 3, 14.20–16.00

Session Chair: Dr Muhammad Akram

- 14.20 *Project PICASSO – Taking MOF post combustion carbon capture from concept to reality*
Edward Lester, University of Nottingham, UK.
- 14.40 *Modelling of CO₂ capture in a 3D pilot-scale rotating packed bed using the Eulerian porous medium approach*
Guojun Zhang, University of Sheffield.
- 15.00 *Biomethanation of CO₂ as an enabling process for carbon recycling and utilisation: experimental and techno-economic research*
Davide Poggio, University of Sheffield, UK
- 15.20 *Simulation and Modelling Study of the TERC Capture Plant to Assess Capture Effectiveness with High CO₂ Content Steel Industry Emissions*
Jack Wells, University of Sheffield.
- 15.40 *Mild – Temperature and Kinetic study of Hydrodeoxygenation of Bio-oil Model Compound over Ni/SiO₂-Al₂O₃ Catalyst*
Ahmed Ibrahim, University of Nottingham, UK

Session 3C – Net Zero Research: The Edge, Hi Tor 4, 14.20–16.00

Session Chair: Mr Peter Sage

- 14.20 *Assessment of technologies for clean ammonia production: Membrane assisted-autothermal reforming (MA-ATR) ammonia process.*
Ahmadu Usman, School of Engineering, University of Hull, UK
- 14.40 *Three-Dimensional Simulation of Sorption-Enhanced Steam Reforming (SE-SR) of Methane in a Circulating Fluidised Bed Reactor*
Chinonyelum Udemu, School of Engineering, University of Hull, UK
- 15.00 *Tribological Behaviour of thermally Sprayed Stellite 6 coatings*
Halar Memon, University of Nottingham, UK
- 15.20 *Optimising Biomass Milling, Classification and Conveying for Enhanced Power Generation*
Orla Williams, University of Nottingham, UK
- 15.40 *Modelling and analysis of novel liquid ammonia energy storage system*
Muhammad Irshad, University of Newcastle, UK

Tea/Coffee Break 16.00 – 16.30

16.30 **Poster Session 1: The Edge Café area**

17.30 **The 4th Clean Energy Science Lecture: The Edge, Hi Tor 2**

The 4th Clean Energy Science Lecture: ***Decarbonising Industry in the UK: Challenges.***
Dr Bryony Livesey, Director, Industrial Decarbonisation Challenge, UKRI, The Edge Hi Tor 2

18.30 **Poster Session 2: Poster Reception and Buffet Dinner: The Edge Café area**

END OF DAY 1

Tuesday, 5th September 2023

Session 4A – China : Clean Energy Research 2: The Edge, Hi Tor 2, 09.00–10.20

Session Chair: Prof Daotong Chong

- 09.00 *Simultaneous reconstruction of the temperature and the soot concentration in flame based on the spectral light field technique*
Jin Jian Li, National Engineering Research Center of Power Generation Control and Safety, School of Energy and Environment, Southeast University
- 09.20 *Modelling on CO₂ emission characteristics of coal-fired power plants under off-design working conditions*
Ming Liu, Xi'an Jiaotong University.
- 09.40 *Critical review of studies in carbon capture for power plants and petrochemical industry.*
Hongchen Liu, University of Sheffield, UK.
- 10.00 *tbc*

Session 4B – Hydrogen/Ammonia 2: The Edge, Hi Tor 3, 09.00–10.20

Session Chair: Dr Jonathan Morris

- 09.00 *Bimetallic Ni-Cu/Al₂O₃ catalysts for low-carbon hydrogen production via sorption-enhanced steam methane reforming*
Siqi Wang, Cranfield University.
- 09.20 *Evaluation of effects of ammonia co-firing on the thermal performances of the supercritical pulverized-coal power plant*
Seong-il Kim, Korea Institute of Industrial Technology, S Korea.
- 09.40 *Numerical Study of the Effect of Hydrogen fuelled Micromix Combustor Geometry Design on NO_x Emission Reduction*
Huanrong Lei, University of Sheffield, UK.
- 10.00 *Gaseous fuel injection assisted with rich hydrogen content in turbojet engine for enhanced thrust and combustion efficiency while minimizing environmental impact on aviation sector*
Arivalagan Pugazhendhi, Van Lang University, Ho Chi Minh City, Vietnam

Session 4C – OPTIMAL 1: The Edge, Hi Tor 4, 09.00–10.20

Session Chair: Prof Meihong Wang

- 09.00 *Capacity configuration of carbon capture and molten-salt energy storage systems in coal-fired power plant through an integrated design, scheduling and control optimization method*
Xianhao Chen, National Engineering Research Center of Power Generation Control and Safety, School of Energy and Environment, Southeast University, Nanjing 210096, China.
- 09.20 *A zero-carbon system based on liquid air energy storage, Brayton cycle and solar power: energy exergy and economic analysis*
Yuxing Ding, CBE, University of Sheffield, UK
- 09.40 *Techno-economic assessment of concentrated solar-driven direct air capture and CO₂ utilisation at commercial scale*
Yide Han, CBE, University of Sheffield, UK.

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- 10.00 *Techno-economic evaluation of a direct air capture (DAC) process using solid adsorbent at commercial scale*
Toluleke Akinola, Chemical and Biological Engineering, University of Sheffield.

Tea/Coffee Break 10.20 – 10.40

Session 5A - Fuels and New Fuels 1: The Edge, Hi Tor 2, 10.40–12.20

Session Chair: Dr Kevin Hughes

- 10.40 *Investigation of peat combustion possibility as an addition to bituminous coal in pulverized pulverised coal-fired thermal power plants*
Nataliya Dunayevska, Thermal energy technology institute of the National academy of science of Ukraine, Ukraine.
- 11.00 *Development of a surrogate and its comprehensive compact chemical kinetic mechanism for the combustion of ATJ fuel*
Saraee Hossein, University of Sheffield.
- 11.20 *Co-milling and Co-firing and the route to decarbonising the coal industry.*
Edward Lester, University of Nottingham.
- 11.40 *Aromatic Selection for Surrogate Jet Fuel Optimisation*
James Cronly, University of Sheffield.
- 12.00 *Kinetics and modelling study of woody biomass and oil shale co-pyrolysis in N₂ and CO₂ atmospheres using TGA*
Lyons Ceron, Tallinn University of Technology, Estonia.

Session 5B – Combustion Processes: The Edge, Hi Tor 3, 10.40 – 12.20

Session Chair: Dr Andrew Goddard

- 10.40 *Managing Coal Assets to end-of-life: A change in approach to Coal Stock Density Measurement*
Will Quick, Uniper Technologies Ltd, Ratcliffe-on-Soar, Nottingham, UK
- 11.00 *Reconstruction of burner flames through tomographic imaging and deep learning*
Dele Ogunjumelo, University of Kent, UK
- 11.20 *Biomass/Biochar Combustion via Chemical Looping: An alternative BECCS Technology*
Fatih Gulec, University of Nottingham, UK
- 11.40 *Multi-mode condition monitoring of an oxy-biomass combustion process through flame imaging and incremental deep learning*
Gang Lu, University of Kent, UK
- 12.00 *3D flame temperature reconstruction with high spatial resolution and efficiency through the modified light-field imaging technique*
Tianxiang Ling, National Engineering Research Center of Power Generation Control and Safety, School of Energy and Environment, Southeastern University, China.

Session 5C – Biomass/Waste 2: The Edge, Hi Tor 4, 10.40 – 12.20

Session Chair: Dr Abby Samson

- 10.40 *Energy Optimization of Smart Farm According to Utilization of Solar Power and Biomass*
Won Yang, Korea Institute of Industrial Technology, S Korea.
- 11.00 *Challenges to Characterise Flow Properties for Biomass and Biowastes*
Tong Deng, The Wolfson Centre for Bulk Solids Handling Technology, University of Greenwich, UK.

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- 11.20 *Autothermal sorption enhanced chemical looping gasification of biomass with inherent CO₂ capture for high-purity H₂ and transportation fuel production.*
Bilainu Oboirien, Department of Chemical Engineering, University of Johannesburg, SA.
- 11.40 *Pelleting and Pellet Milling of Bagasse Trash: The Influence of Harvest Season, Moisture Content and Particle Size*
Ho Lao, University of Nottingham, UK
- 12.00 *Material handling challenges on new Energy from Waste and Biomass Plants*
Guy Sharp, RJM International, Winchester, UK.

Lunch 12.20 – 13.30

Session 6A - Emissions 1: The Edge, Hi Tor 2, 13.30 – 14.50

Session Chair: Prof Ed Lester

- 13.30 *Evaluation of Techniques Recommended to Convert Used Nonwoven Filtration Media from the Energy Sector Between the As-Received State to the Post-Cleaned State*
Daniel Curry, University of Sheffield, UK.
- 13.50 *Investigation on fuel production and engine analysis of a new promising alternative with the aid of an optimized reactor: Production, Characterization, Consumption and Emission studybiogas*
Saraee Hossein, University of Sheffield, UK.
- 14.10 *Development of Low Emission, compact flame, gas burners for package and utility boilers*
Guiseppa Ceriello, RJM International, Winchester, UK
- 14.30 tbc

Session 6B – China : Clean Energy Research 3: The Edge, Hi Tor 3, 13.30 – 14.50

Session Chair: Dr Eni Oko

- 13.30 *Effect of structural characteristics and surface functional groups of chemically activated biochar on thermal properties of different organic phase change materials*
Laiquan LV, State Key Laboratory of Clean Energy Utilization, Institute for Thermal Power Engineering, Zhejiang University, China.
- 13.50 *Quantitative Measurement of Burner Flame Stability through Digital Image Processing and Spectroscopic Analysis*
Weicheng Xu, North China Electric Power University, China.
- 14.10 *Effect of kaolin additive on the combustion characteristics of Zhundong coal based on image analysis and FES method*
Yang Pu, Huazhong University of Science and Technology, China.
- 14.30 tbc

Session 6C – British Research Flame Committee: The Edge, Hi Tor 4, 13.30 – 14.50

Session Chair: Dr Robin Irons

- 13.30 *An overview of the current and planned activities of British Flame Research including identification of emergent research issues in 'net-zero' combustion systems.*
Robin Irons, University of Nottingham, BFRC Chair, UK.
- 13.50 *Regulation of Hydrogen Combustion to Ensure Parity with Natural Gas*
David Graham, Uniper Technologies Ltd, Ratcliffe-on-Soar, Nottingham.

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- 14.10 *Hydrotreated Vegetable Oil as a Low-Carbon Liquid Fuel for Aero-derivative Gas Turbine Power Generation*
Jon Runyon, Uniper Technologies, Ltd, Ratcliffe-on-Soar, Nottingham, UK.
- 14.30 *Deflagration in gaseous fuel systems - safety implications for industrial application during the transition to H₂-rich fuels – Planned experimental studies to address key data needs*
Richard Marsh, Cardiff University, UK.

Tea/Coffee Break 14.50 – 15.20

Session 7A – Optimal 2: The Edge, Hi Tor 2, 15.20 – 16.40

Session Chair: Prof Meihong Wang

- 15.20 *Systematic assessment of water-lean solvent application in post-combustion CO₂ capture system in the United Kingdom*
Eni Oko, University of Newcastle, UK
- 15.40 *Study of Direct Air Capture Plant integrated with a Biomass-fired Power Plant through Process Simulation*
Shengyuan Huang, University of Sheffield, UK
- 16.00 *Modelling and techno-economic assessment of post-combustion CO₂ capture in rotating packed bed using piperazine as a solvent*
Olajide Otitoju, CBE, University of Sheffield, UK.
- 16.20 *Computational catalyst design for catalyzed desorption in post-combustion CO₂ capture (PCC) process*
Eni Oko University of Newcastle, UK

Session 7B – Gasification/Pyrolysis 2 The Edge, Hi Tor 3, 15.20 – 16.40

Session Chair: Prof Richard Marsh

- 15.20 *Development of an autothermal integrated methane pyrolysis with chemical looping combustion for onsite hydrogen production*
Fatih Gulec, University of Nottingham, UK
- 15.40 *Pyrolysis of plastic waste over waste-derived catalysts*
Gerardo Martinez-Narro, University of Newcastle, UK.
- 16.00 *Simultaneous deoxygenation and cracking of hydrolysed vegetable oils into fuel-range liquid hydrocarbons in the presence of Pt-based catalysts.*
Jude Onwudili, Aston University, UK.
- 16.20

Session 7C – The Edge, Hi Tor 4, No session (visit afternoon) : 15.20 – 16.40

INDUSTRIAL VISITS: 13.30 – 17.00

Limited places on bussed visits to a local Biomass/Waste to Energy Plant

19.00 Conference Dinner : Firth Hall, Firth Court, University Campus,
Coach pick up, 18.45.h. from the Edge Conference Centre.

END OF DAY 2

Wednesday, 6th September 2023

Session 8A – Fuels and New Fuels 2: The Edge, Hi Tor 2, 09.00 – 10.40

Session Chair: Dr Kevin Hughes

- 09.00 *A route to a net zero iron ore sintering: Fuel switching and waste heat utilisation.*
Sam Reis, CEMEG, Faculty of Science and Engineering, Swansea University
- 09.20 *The fate of sulphur from injection coals used in blast furnace ironmaking and the implications on the process, and sulphur in hot metal*
Julian Steer, Cardiff University, UK.
- 09.40 *Challenge associated with hydrogen combustion*
Bahamin Bazooyar, Brunel University and Cranfield University, UK.
- 10.00 *A computational and experimental study of combustion characteristics of kerosene-based mixtures*
Si Shi, University of Sheffield, UK
- 10.20 *One-pot catalytic co-hydrotreating of Bio-liquid fractions with vacuum gas oil.*
Kamal K Pant, Indian Institute of Technology, Delhi, India.

Session 8B – Optimal 3: The Edge, Hi Tor 3, 09.00 – 10.40

Session Chair: Dr Eni Oko

- 09.00 *Techno-economic Analysis of Large-scale Piperazine-based Post-combustion Carbon Capture and CO₂ Compression Process through Simulation*
Jiayi Ren, CBE, University of Sheffield, UK.
- 09.20 *Design and Performance Evaluation of Solar-Aided Coal-fired Power System considering Operational Flexibility and Efficiency*
Hui Yan, State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, China.
- 09.40 *Hybrid modelling/simulation and analysis for heat transfer and fluid flow of convection section in thermal cracking furnace*
Yao Zhang, CBE, University of Sheffield, UK.
- 10.00 *Intelligent scheduling of a low-carbon ethylene production system through deep reinforcement learning*
Cheng Zheng, National Engineering Research Center of Power Generation Control and Safety, School of Energy and Environment, Southeast University, China.
- 10.00 *tbc*

Session 8C – SuperGen: The Edge, Hi Tor 4, 09.00 – 10.40

Session Chair: Dr Spiridon Siouris

- 09.00 *Can modern bioenergy enable Nigeria's transition to a low-carbon future?*
Antony Okoro, Aston University, UK
- 09.20 *Pyrolysis of invasive plant to assess the bioenergy potential in Kgalagadi, Botswana*
Mpho Rapoo, Aston University, UK
- 09.40 *Techno economic and life cycle assessment of olefins production through CO₂ hydrogenation within the Power-to-X concept.*
Gabriela Cuevas-Castillo, University of Sheffield, UK

Posters

- 10.00 *Modelling of aviation fuels and fuel systems: Recent advances and future work*
Spiridon Siouris, University of Sheffield, UK
- 10.20 *Biochar as sustainable supporting matrix for development of form stable latent heat storage material*
Dudul Das, James Watt School of Engineering, University of Glasgow, UK

Tea/Coffee Break 10.40 – 11.00

Session 9A – Biomass/Waste 3: The Edge, Hi Tor 2, 11.00 – 12.40

Session Chair: Prof Jenny Jones

- 11.00 *Understanding the Current and Future role of Bioenergy in the UK's Net-Zero Transition.*
Jonathan Morris, Energy Systems Catapult, Birmingham.
- 11.20 *Improving utilisation of new Energy from Waste and Biomass Plants by identification and resolving of constraints*
Trudy Beeley, RJM International, Winchester, UK
- 11.40 *Sustainable aviation fuel (SAF) production through power-to- liquid (PtL): A combined techno-economic and life cycle assessment*
Maria Fernanda Rojas-Michaga, University of Sheffield, UK
- 12.00 *Thermal decomposition of blends of waste tyres and plastics*
Naadhira Seedat, University of Johannesburg, SA.

Session 9B – Green Processes 2: The Edge, Hi Tor 3, 11.00 – 12.40

Session Chair: Dr Bijal Gudka

- 11.00 *Towards valorization of waste CO₂ in industrial plant effluent into cyclic carbonates: Influence of CO₂ partial pressure, temperature, and gas composition*
Udeme Eton, University of Nottingham, UK
- 11.20 *Functionalised amino acids for improving direct air capture (DAC) capacity of conventional paints: a preliminary study*
Zufishan Shamair, Teesside University, UK.
- 11.40 *Comparative Life Cycle Analysis of Metal Organic Framework and Amine Scrubbing Post-Orla Williams, University of Nottingham, UK.*
- 12.00 *Downflow Gas Contactor (DGC) Unit for CO₂ Capture.*
Tohid Borhani, School of Engineering, Computing and Mathematical Sciences, University of Wolverhampton, UK

Session 9C – Emissions 2: The Edge, Hi Tor 4, 11.00 – 12.40

Session Chair: Dr Abby Samson

- 11.00 *NO_x emissions study on a non-premixed NH₃/CH₄ swirling flame using LES-FGM method*
Nicholoy Pestheruwe, University of Sheffield, UK.
- 11.20 *New Exhaust Gas Clean-Up Systems for the Combustion of New, Low-Carbon Fuels in Heavy-Duty Engines*
Madhumitha Rajendran, University of Sheffield, UK

Posters

- 11.40 *The Simulation of Liquefied Petroleum Gas Burners Running on Propane and Dimethyl Ether Blends: An Emissions and Performance Comparative Study*
Jordan Walsh, University of Sheffield, UK.
- 12.00 *Revealing the Effect of Moisture on Methane Adsorption in Kerogens by Molecular Simulation and Experiment*
Wei Li, University of Nottingham, UK.

Closing remarks: The Edge, Hi Tor 2

- 12.20 Prof Bill Nimmo, 2nd FERIA Conference Chairman.
- 13.00 **LUNCH**

POSTERS (Monday 4th September)

1. Fibre-Optic Based Infrared Radiation Temperature Measurement of Proton Exchange Membrane Fuel Cells., **William Rupp**, Department of Mechanical Engineering, University of Sheffield.
2. Measurement of Moisture and Temperature Distributions in a Biomass Silo Based on Capacitive and Acoustic Tomography, **Ge Guo and Xingxing Zeng**, North China Electric Power University
3. Mass Flow Rate Measurement of Pulverised Fuel in a Square-Shaped Pipe Through Multi-sensor Fusion and Data-Driven Modelling, **Xingxing Zeng**, North China Electric Power University
4. Technical and economic analysis of post-combustion carbon capture process using potassium carbonate solvent through process modifications for large-scale CCGT power plants, **Mohammad Arishi**, CBE, University of Sheffield
5. Off-design Performance of the Radiation Section in an Ethylene Cracking Furnace based on Exergy Analysis, **Hui Yan**, State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University.
6. Development of innovative hydrogen production and storage technologies for a net-zero emission society, **Carolina Font-Palma**, School of Engineering, University of Hull.
7. Future Waste Heat Recovery Potential from a Hydrogen Fuelled Reheat Furnace at a Steelworks, **Jonathan Morris**, Energy Systems Catapult, Birmingham.
8. The Combustion of Pulverized Biomass in an Industrial Scale Combustion Test Furnace, **Alan Williams**, University of Leeds.
9. Heterogeneous Catalytic combustion of syngas hydrogen-rich fuel, **Bahamin Bazooyar**, Brunel University and Cranfield University, UK.
10. In-situ monitoring and characterisation of agglomeration and defluidisation in a biomass FB combustor through digital imaging, **Gang Lu**, University of Kent, Canterbury, Kent and University of Nottingham.
11. Reducing slagging and corrosion properties of fuels with a high content of alkali and alkaline earth metals, **Nataliya Dunayevska**, Thermal Energy Technologies Institute of NAS of Ukraine and L.M. Litvinenko Institute of Physical-Organic and Coal Chemistry (IPOCC) of NAS of Ukraine.
12. *Ash interaction from Chemical Looping Combustion (CLC) of MSW/biomass*
Bilainu Oboirien, Department of Chemical Engineering, University of Johannesburg, SA.
13. Processes of Interaction of Solid Fuels of Different Origins during their Thermal Conversion, **Nataliya Dunayevska**, Thermal Energy Technology Institute of the National Academy of Sciences of Ukraine, Kyiv, Ukraine.
14. Energy Fuel Consumption in Ukraine: Today and Future Situation
Nataliya Dunayevska, *Thermal Energy Technology Institute of the National Academy of Sciences of Ukraine, Kyiv, Ukraine.*
15. Future waste heat recovery – Industry Decarbonisation
Yi Wei, *University of Sheffield, UK*
16. Exhaust Gas Waste Heat Recovery: Thermoelectrics

Posters

John Gueritz, *University of Lincoln, UK*