Monday, 15th September - 09.15-09.55

Opening Session

09.25 Keynote address: Future power generation from coal in the UK – policy, technologies and supporting research
M Pourkashanian, Professor of Energy Engineering, University of Leeds, UK

Monday, 15th September - 10.00-11.20

Session 1A - CO₂ capture technology
Session Chair: Alan Williams

10.00 Pilot plant results for advanced CO₂ capture process using amine scrubbing
Adam Tatarczuk, Institute for Chemical Processing of Coal, Poland

10.20 Integration of calcium looping technology in existing cement plant for CO₂ capture: process simulation and economic perspectives
Nikolaos Nikolopoulos, Centre for Research and Technology Hellas, Greece

10.40 Identification of heat integration opportunities in calcium looping CO₂ capture plant
Dawid Hanak, Cranfield University, UK

11.00 CCS system modelling: enabling technology to help accelerate commercialisation and manage technology risk
Adekola Lawal, Process Systems Enterprise, UK

Session 1B - Gasification 1
Session Chair: Alan Thompson

10.00 Production of syngas by pressurised fluidised bed gasification of German lignite in a steam/carbon dioxide atmosphere
Xiangyi Long, Imperial College London, UK

10.20 Study of operating and material parameters for continuous lock-free feeding into gasification using briquetting press
Alexander Rosin, TU Bergakademie Freiberg, Germany

10.40 Pressurized gasification of coal chars under CO₂/CO atmospheres – a kinetic study
Martyna Tomaszewicz, Institute for Chemical Processing of Coal, Poland

11.00 Kinetic analysis of redox reactions of natural Fe-based oxygen carriers by using TG method
Piotr Babinski, Institute for Chemical Processing of Coal, Poland

Monday, 15th September - 11.45-13.05

Session 2A - Modelling of oxy-fuel and CCS
Session Chair: Lin Ma

11.45 Modelling and simulation of a coal-fired supercritical power plant integrated to a CO₂ capture plant
Elvis Agbonghae, University of Leeds, UK

12.05 Estimation of density for partially carbonated alkanolamine solutions using quantitative structure-property relationships (QSPR)
Marcin Stec, Institute for Chemical Processing of Coal, Poland

12.25 LES and RANS of air and oxy-coal combustion in a pilot-scale facility: predictions of
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Chair</th>
<th>Speaker</th>
<th>Institution</th>
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</thead>
<tbody>
<tr>
<td>10.45</td>
<td>Lattice Monte Carlo simulation of single coal char particle combustion under oxy-fuel conditions</td>
<td>David McCaffrey</td>
<td>Rastko Jovanovic</td>
<td>Institute of Nuclear Sciences “Vinca”, Serbia</td>
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<tr>
<td>11.45</td>
<td>The effect of particle size on the torrefaction of willow and eucalyptus</td>
<td>David McCaffrey</td>
<td>Leilani Darvell</td>
<td>University of Leeds, UK</td>
</tr>
<tr>
<td>12.05</td>
<td>Experimental study on cofiring high shares of torrefied fuels in a 500KW pulverized coal boiler</td>
<td>David McCaffrey</td>
<td>Collins Ndibe</td>
<td>Universität Stuttgart, Germany</td>
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<tr>
<td>12.25</td>
<td>Hydrogen-rich syngas production via sawdust gasification on nano iron-zinc-alumina catalysts</td>
<td>David McCaffrey</td>
<td>Fangzhu Jin</td>
<td>University of Sydney, Australia</td>
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<tr>
<td>12.45</td>
<td>Characterization and co-firing potential of a high ash coal with Bambusa Bacooa</td>
<td>David McCaffrey</td>
<td>Samson Bada</td>
<td>University of the Witwatersrand, South Africa</td>
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<tr>
<td>13.45</td>
<td>Neural network approach for predicting drum-boiler dynamics in coal-fired subcritical power plant</td>
<td>Meihong Wang</td>
<td>Eni Oko</td>
<td>University of Hull, UK</td>
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<td>14.00</td>
<td>Modelling and simulation of intensity regenerator for post combustion CO$_2$ capture</td>
<td>Meihong Wang</td>
<td>Atuman Joel</td>
<td>University of Hull, UK</td>
</tr>
<tr>
<td>14.20</td>
<td>Modelling and optimisation of a post-combustion CO$_2$ capture process using neural networks</td>
<td>Meihong Wang</td>
<td>Jie Zhang</td>
<td>Newcastle University, UK</td>
</tr>
<tr>
<td>14.40</td>
<td>Steady state simulation and exergy analysis of supercritical coal-fired power plant with CO$_2$ capture</td>
<td>Meihong Wang</td>
<td>Akeem Olaleye</td>
<td>University of Hull, UK</td>
</tr>
<tr>
<td>14.40</td>
<td>Optimal functioning parameters for a Stirling engine heater</td>
<td>Meihong Wang</td>
<td>Fethi Aloui</td>
<td>Université de Monastir, Tunisia</td>
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<tr>
<td>15.00</td>
<td>Predicting coking pressures through a combination of different analytical parameters</td>
<td>John Patrick</td>
<td>Miguel Castro-Diaz</td>
<td>University of Nottingham, UK</td>
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<tr>
<td>15.00</td>
<td>Impact of coking conditions on CSR</td>
<td>John Patrick</td>
<td>Philip Bennett</td>
<td>ALS Coal, Australia</td>
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<tr>
<td>15.00</td>
<td>Characterisation of coke oven residue and coke particulate analysis</td>
<td>John Patrick</td>
<td>Ed Lester</td>
<td>University of Nottingham, UK</td>
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<tr>
<td>15.20</td>
<td>Evaluation of coking coals</td>
<td>John Patrick</td>
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</tbody>
</table>
10th ECCRIA – Detailed Programme (provisional)

Philip Bennett, ALS Coal, Australia

15.40 Study of integration of cryogenic air energy storage and coal oxy-fuel coal combustion through modelling and simulation
Mathew Aneke, University of Hull, UK

Tuesday, 16th September - 09.00-10.20

Session 4A - Flow measurement
Chairman: Chuanlong Xu

09.00 Flow characterisation of coal and inert particles in a circulating fluidised bed using an electrostatic sensor array
Wenbiao Zhang, North China Electric Power University, China

09.20 Development of an electrical array sensor for monitoring particle size, velocity and concentration in a pneumatically conveyed coal/biomass flow
James Coombes, University of Kent, UK

09.40 Concentration measurement of pulverised coal in pneumatic conveying pipelines using acoustic emission and electrostatic sensors
Xiangchen Qian, North China Electric Power University, China

10.00 Theoretical study on leakage of urban medium-pressure natural gas pipeline
Peng Xu, University of Hull, UK

Session 4B - Low rank and brown coals
Chairman: James Ashman

09.00 Processing of low rank coal for various applications
Roland Aekersberg, Loesche, Germany

09.20 Reactivity analysis of Thar (Pakistan) lignite under various conditions in a thermogravimetric analyser and combustion in a pulverised fuel rig
Muhammad Tayyeb Javed, University of Leeds, UK

09.40 Simulation of thermal stresses in membrane walls of a coal-fired boiler using CFD and FEM tools
Nikolaos Nikolopoulos, Centre for Research and Technology Hellas, Greece

10.00 Fast pyrolysis of a German brown coal in a pressurised drop tube reactor
Stephan Siegl, TU Bergakademie Freiberg, Germany

Tuesday, 16th September - 10.45-12.25

Session 5A - Characterisation
Chairman: Ed Lester

10.45 Bond Index and Hardgrove Grindability Index test for biomass and coal
Orla Williams, University of Nottingham, UK

11.05 A novel procedure to identify mercury species in carbonaceous materials
Marta Rumayor, CSIC, Spain

11.25 Combustion perspectives of Pakistani coals with specific emphasis on Salt range and Trans Indus coal
Shafiq ur Rehman, University of Sheffield, UK

11.45 Using micro-Raman spectroscopy as tool to predict slagging and fouling


propensities of coals
Herman Potgeiter, University of the Witwatersrand, South Africa
12.05 \textit{CO}_2 \text{ pump for } \textit{CCS} \text{ transport pipelines}
Chima Okezue, University of Hull, UK

\textbf{Session 5B - Boilers and combustion}
\textbf{Session Chair: Nikolaos Nikolopoulos}

10.45 \textit{Characterising the effects of moisture on solid fuel combustion using experimental and computational fluid dynamics (CFD) analysis}
Archi Sarroza, University of Nottingham, UK
11.05 \textit{CO}_2\text{-enhanced coal gasification in circulating fluidised bed reactor}
Martyna Tomaszwicz, Institute for Chemical Processing of Coal, Poland
11.25 \textit{Comparison of explosion characteristics of Colombian and Kellingley coal}
Gordon Andrews, University of Leeds, UK
11.45 \textit{Coal combustion and performance of a circulating fluidised bed boiler - a case study}
B Saravana Bavan, Parsons Brinckerhoff, UK
12.05 \textit{Optimal integration of a coal-fired power plant to a CO2 capture plant based on parametric studies}
Elvis Agbonghae, University of Leeds, UK

\textbf{Tuesday, 16\textsuperscript{th} September - 13.40-15.00}

\textbf{Session 6A - Oxy-fuel combustion}
\textbf{Session Chair: Toby Lockwood}

13.40 \textit{3-D reconstruction and characterisation of oxy-coal flames on a 250KW combustion test facility}
Moinul M Hossain, University of Kent, UK
14.00 \textit{Kinetic study on pressurized oxy-fuel combustion of coal chars}
Piotr Babinski, Institute for Chemical Processing of Coal, Poland
14.20 \textit{Nickel nanoparticles for enhancing carbon capture: temperature-dependent kinetics and applications}
Gaurav Bhaduri, Newcastle University, UK
14.40 \textit{Exergy analysis on pollutant emission and environmental impact assessment of power plant}
Wenhuan Wang, Shanghai University, China

\textbf{Session 6B - Emissions}
\textbf{Session Chair: Marcos Millan}

13.40 \textit{Fuel enrichment clean coal technology for improving efficiency and reducing emissions}
Syed Sheraz Daood, International Innovative Technologies, UK
14.00 \textit{Conversion of SO2 during pressurized oxy-fuel combustion}
Janusz Lasek, Institute for Chemical Processing of Coal, Poland
14.20 \textit{Influence of oxy-fuel combustion conditions on mercury retention by fly ashes}
Nuria Fernandez Miranda, National Institute of Coal, Spain
14.40 \textit{Activity and characterization of a Ce-W-Ti oxide catalyst prepared by a sol-gel method for selective catalytic reduction of NO with NH}_3
Ye Jiang, China University of Petroleum, China
10th ECCRIA – Detailed Programme (provisional)

Tuesday, 16th September - 15.25-16.45

**Session 7A - Biomass 1**
**Session Chair: Bill Nimmo**

15.25 *Single particle flame-combustion studies on solid biomass fuels*
Patrick Mason, University of Leeds, UK

15.45 *Mechanical degradation of woody biomass pellets during storage in stockpiles*
Shalini Graham, University of Nottingham, UK

16.05 *Vinassee – a potential biofuel, co-firing with coal in a fluidised bed*
Muhammad Akram, University of Sheffield, UK

16.25 *Study on energy integration of a CO₂ capture process with a power generation process*
Jian Chen, Tsinghua University, China

**Session 7B - Coal-derived products 2**
**Session Chair: Carmen Barriocanal**

15.25 *Processing of hard coal fines by binder briquetting for use in smelting reduction processes*
Reinhard Lohmeier, TU Bergakademie Freiberg, Germany

15.45 *Inhibition of chlorinated organic compounds production by co-pyrolysis of poly(vinyl chloride) with cation exchanged coal*
Motoyuki Sugano, Jissen Women's University, Japan

16.05 *Opportunities to improve the utilisation of coals for blast furnace coal injection*
Julian Steer, Cardiff University, UK

16.25 *Flow measurement of pulverised coal on a full-scale power plant using ring-shaped electrostatic sensor arrays*
Xiangchen Qian, North China Electric Power University, China

Wednesday, 17th September - 09.00-10.40

**Session 8A - Ash, trace elements and deposition**
**Session Chair: Mohammed Tayyeb Javed**

09.00 *Advances in understanding trace element partitioning during pulverized coal combustion*
Wayne Seames, University of North Dakota, USA

09.20 *Correlations of ash fusion temperatures for ashes from hard coal, lignite, and biomass with mineral composition under different atmosphere conditions*
Markus Reinmüller, TU Bergakademie Freiberg, Germany

09.40 *Major and trace elements in coal bottom ash at different oxy-coal combustion conditions*
Bilainu Oboirien, CSIR South Africa, South Africa

10.00 *A regime-segregated model for trace element partitioning during pulverized coal combustion*
Wayne Seames, University of North Dakota, USA

10.20 *Corrosion in oxyfuel environments and the effect of coal and biomass ash deposits*
Toore Rizvi, University of Leeds, UK
### Session 8B - Pyrolysis, UCG, liquefaction

**Session Chair:** Philip Bennett

<table>
<thead>
<tr>
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<tr>
<td>09.00</td>
<td>Experimental study on the impact of pressurized gases in the efficient energy conversion of gasified coal-char to syngas in the context of underground coal gasification</td>
<td>Eleni Konstantinou</td>
<td>Cardiff University, UK</td>
</tr>
<tr>
<td>09.20</td>
<td><em>Direct liquefaction of lower-rank coals as a sustainable route to fuels</em></td>
<td>Martin Trautmann</td>
<td>University of Stuttgart, Germany</td>
</tr>
<tr>
<td>09.40</td>
<td>Characterisation of biomass char structures</td>
<td>Ed Lester</td>
<td>University of Nottingham, UK</td>
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<tr>
<td>10.00</td>
<td>A novel nano-Ni/MgO catalyst for hydrogen production from steam reforming or ethanol/methanol</td>
<td>Kaiqi Shi</td>
<td>University of Nottingham Ningbo, China</td>
</tr>
<tr>
<td>10.20</td>
<td><em>Mechanism of improving slurryability of brown coal by using solvent pre-treatment</em></td>
<td>Meng Liu</td>
<td>Southeast University, China</td>
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</table>

**Wednesday, 17th September - 11.05-12.45**

### Session 9A - Biomass 2

**Session Chair:** Leilani Darvell

<table>
<thead>
<tr>
<th>Time</th>
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</tr>
</thead>
<tbody>
<tr>
<td>11.05</td>
<td>Experimental ignition of biomass and coal particles in oxy-fuel atmospheres for CO₂ capture</td>
<td>Hannah Chalmers</td>
<td>University of Edinburgh, UK</td>
</tr>
<tr>
<td>11.25</td>
<td>Prediction of biomass char yield and reactivity by universal correlation with aromatic carbon content</td>
<td>Philip Jenkinson</td>
<td>Haider Green University of Nottingham, UK</td>
</tr>
<tr>
<td>11.45</td>
<td>Synergetic effect during biomass co-firing under oxy-fuel conditions</td>
<td>Timipere Salome Farrow</td>
<td>University of Nottingham, UK</td>
</tr>
<tr>
<td>12.05</td>
<td>Experimental study on ignition behaviour of coal and biomass in a visual drop tube furnace</td>
<td>Tom Bennet</td>
<td>University of Nottingham, UK</td>
</tr>
<tr>
<td>12.25</td>
<td>Simulation of conventional and CO₂ enhanced biomass gasification: a comparative assessment using aspen plus</td>
<td>Kaiqi Shi</td>
<td>University of Nottingham Ningbo, China</td>
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### Session 9B - IGCC and gas turbines

**Session Chair:** Greg Kelsall

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>11.05</td>
<td>Dynamic simulation study on IGCC process with novel activated carbon based pre-combustion carbon capture</td>
<td>Yue Wang</td>
<td>University of Warwick, UK</td>
</tr>
<tr>
<td>11.25</td>
<td>Large eddy simulation of combustion instability in gas turbine engines</td>
<td>Jianguo Wang</td>
<td>University of Hull, UK</td>
</tr>
<tr>
<td>11.45</td>
<td>Effect of alkali concentration on the synthesis of Na-X zeolite form Lakhra coal power plant fly ash</td>
<td>Suhail Soomro</td>
<td>Mehran University of Engineering and Technology Jamshoro, Pakistan</td>
</tr>
<tr>
<td>12.05</td>
<td>Application of Helmholtz resonators as combustion dynamics stabilising devices for advanced power generation</td>
<td>Tom Bennet</td>
<td>University of Nottingham, UK</td>
</tr>
</tbody>
</table>
10th ECCRIA – Detailed Programme (provisional)

Philip Rubini, University of Hull, UK

12.25  Heat integration study of combined cycle gas turbine power plant integrated with post-combustion CO₂ capture and compression
Xiaobo Luo, University of Hull, UK