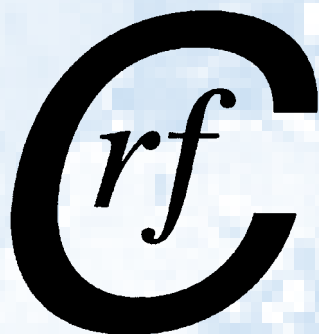


REGISTRATION & PROGRAMME

6TH EUROPEAN CONFERENCE ON COAL RESEARCH & ITS APPLICATIONS



Organised by the Coal Research Forum
<http://www.coalresearchforum.org>



5th – 7th September 2006

University of Kent
Grimond Building
Canterbury
Kent
UK

Sponsored by

E.ON UK plc., RWEpower plc., Scottish Power plc., Mitsui Babcock Energy Ltd. and BCURA.

BACKGROUND

The Coal Research Forum was formed in 1989 to encourage, promote and co-ordinate basic research on coal, coal characterisation, coal products and coal utilisation in the UK. Particular emphasis is given to the promotion and co-ordination of contact between academe and industry and the assessment and co-ordination of resources and needs concerned with coal utilisation and conversion.

The UK National Meeting on Coal Research and its Applications was first held in 1996 and, with the sixth meeting planned for September 2006, this is now an established biennial event. The fifth meeting, held in 2004 at the University of Edinburgh, was successful in attracting nearly 100 abstracts, which were given mainly as oral presentations with around 35 poster presentations. A special publication of FUEL was subsequently prepared which included a number of the presentations as full papers. Hopeful of building on this success the sixth meeting is now planned for September 2006 and will be held at the University of Kent. The high level of interest in the conference has resulted in the decision to use parallel technical sessions.

Canterbury, England's most famous cathedral city of Geoffrey Chaucer's Canterbury Tales, and now a UNESCO world heritage site, sits on the River Stour in one of the most attractive corners of rural Kent. The Norman cathedral still dominates the skyline as you approach the city, giving 21st century visitors the same sense of awe as their medieval counterparts. Making a pilgrimage was an important part of medieval life and pilgrim's flocked to the city to visit the shrine of the Archbishop of Canterbury, Thomas Becket, who was murdered in his cathedral. It is easily reached by road, rail or sea, and has been welcoming visitors for thousands of years. The University of Kent is the closest UK University to Europe, with good links with Europe by rail, (Eurostar station to Ashford), by sea, (ferry services to Dover, Folkestone, Ramsgate and other Kent ports), and by air, (the London Airports and East Kent Airport).

It is hoped that attendees from outside the UK will continue to support this event.

SCOPE AND PURPOSE

The purpose of this conference is to bring together researchers in universities with participants from industry who also carry out research or are interested in the application of the research in industry. Papers were invited which described applications in coal utilisation and preparation with particular reference to the following areas: ***improving efficiency and reducing emissions in conventional power generation, CO₂ removal and storage technologies, advanced power generation, modelling, sensors, instrumentation and control, emissions issues – including, mercury, VOC's and fine particulates, co-firing of coal, particularly with biomass and wastes, carbonisation and other metallurgical uses, coal preparation and handling and other coal conversion processes.***

PROCEEDINGS

All authors of accepted papers are invited, should they wish, to send a full paper to the Conference Secretary by 30th September 2006. It is intended that these will be published in a special edition of FUEL. All full papers will be subject to the normal refereeing requirements of FUEL and should be prepared in accordance with the instructions for authors, which are published by the journal.

REGISTRATION

One of the principal aims of this conference is to encourage wide participation and to enable this the cost to participants has been kept to a reasonable level. The Conference Fee will be £220 for members of the CRF and of the Coal Utilisation Subject Group of the IChemE. For non-members the fee is £330. The fee will include tea/coffee and lunches, a buffet reception on the evening of Monday, 5th September and a Conference Dinner, which will take place on the evening of Tuesday, 6th September. There will be a reduced fee of £110 for bona-fide research students. Student registrations should be accompanied by a letter from their supervisor confirming student status. There will also be a one-day rate, which is set at £95 for CRF and CUSG members, £140 for non-members and £55 for students. The one-day rate includes tea/coffee and lunch on that day only. The cost for the buffet dinner on Tuesday 5th is £30 and for the Conference dinner on Wednesday 6th is £35. All participants are asked to meet their own accommodation and travel costs and details of accommodation options are given below. **It should be noted that a surcharge of £50 per application will be charged for registrations after 31st July 2006.**

ACCOMMODATION

Accommodation will be available in the Halls of Residence. The cost for a single room with bed and breakfast is £32 per night with en-suite facilities and £25 with shared bathroom and toilet. Twin rooms are available at £55 per night (where all costs include breakfast). Those wishing to reserve the above accommodation should include both their registration and accommodation costs when they return the registration form. Participants wishing to reserve accommodation in local hotels should indicate on the registration form and information will be sent for them to make their own arrangements.

ORGANISING COMMITTEE

Prof. J.W. Patrick	University of Nottingham	(Chairman)
Dr A.W. Thompson	University of Nottingham	(Secretary)
Dr D.J.A. McCaffrey	McEnergy	(Treasurer)
Mr R.M. Davidson	IEA Clean Coal Centre	(Programme Co-ordinator)
Prof. Y. Yan	University of Kent	(Local Organiser)
Mr B.W. Smith	Mitsui Babcock Energy Ltd.	(Industrial Representative)
Mr P. Cook	E.ON UK plc	(Industrial Representative)

FURTHER INFORMATION

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IEA CLEAN COAL CENTRE WORKSHOP

A Coal Science Workshop on Image analysis, modelling and monitoring will precede the conference. It will take place on 4 September. It will be hosted by the IEA Clean Coal Centre and there will be no additional fee to attend this event. Anyone interested in attending or contributing to the workshop should contact Robert Davidson at the Clean Coal Centre, robert@iea-coal.org.uk

Tuesday, 5th September 2005

08.30-09.20 Arrival, registration, coffee, tea

09.20-09.30 Welcome from Professor Yong Yan, University of Kent,
Welcome from Professor John Patrick, Conference Chairman.

09.30-10.10 Opening address by Mr Brian E Ricketts, International Energy Agency, Paris

1A: Monitoring, control and modelling I

10:10- On-line fuel tracking by advanced flame
10:30 monitoring – demonstration trials at a full
scale power station

Xu L, Carter R M, Yan Y, Cornwell S, Riley G S

10:30- Modelling and experimental validation of
10:50 electrostatic sensors for pulverised fuel
flow monitoring

Krabicka J, Carter R M, Yan Y

10:50- How to balance pneumatically conveyed
11:10 fuel supply to burners in power stations

Aroussi A

11:10- Break

11:40

2A: Monitoring, control and modelling II

11:40- Computer modelling of the combined
12:00 effects of plant conditions and coal quality
on burnout in utility furnaces

Stephenson P L

12:00- Monitoring, modelling and controlling
12:20 stoker-fired boiler plant

Thai S M, Wilcox S J, Ward J

12:20- Development of fragmentation models for
12:40 solid fuel combustion and gasification as
sub-routines for inclusion in CFD code

Syred N

12:40- Power plant performance model using on-
13:00 line coal analysis

Munukutla S

13:00- Lunch

14:30

3A: Image processing

14:30- Three-dimensional measurement of flame
14:50 temperature through optical process
tomography

Gilabert G, Lu G, Yan Y, Cornwell S

1B: Combustion

The combustion characterisation and detailed
slagging and fouling determination of pulverised
coals and biomass and waste fuels

van de Kamp W L, Korbee R, Cieplik M, Kiel J H A

The operational comparison of a modern European 2
x 110 MWe CFB power plant against other typical
coal fired stations

Mould S

Development of an improved sparge pipe air
distributor for a high temperature fluidised bed
combustor

*Garwood D R, Bowen D R, Ward J, Fisher M, Kaye W,
Gent D*

2B: Co-firing I

Pyrolysis kinetics and combustion characteristics of
waste recovered fuels

Skodras G, Grammelis P, Basinas P,

Sakellariopoulos G P

Biomass co-firing – the effect of biomass injection
methods on combustion and environmental
performance

Beeley T J, Whitehouse M, Malmgren A, Riley G S

A technical and environmental analysis of co-
combustion of coal and biomass in fluidised bed
technologies

McIlveen-Wright D R, Huang Y, Rezvani S, Wang Y

Impact of biomass co-combustion and combustion
conditions on mercury partitioning at Kingsnorth
Power Station, UK

*Quick W J, Corns W R, Tembrink J, Cieplik
M, Therwarth H, Bowden S*

3B: Trace elements I

Mercury and selenium retention in fly ashes:
influence of unburned particle content

*López-Antón M A, Díaz-Somoano M, Martínez-
Tarazona M R*

14:50- 15:10	Burnout modelling of biomass and coal using advanced image analysis methods <i>Wu T, Lester E, Gong M, Thompson A W, Aquino Z</i>	On-line monitoring of boron in coal-fired power plant wastewaters on automated measuring equipment with ion-selective methods <i>Abe K, Ohyama S, Miyazaki N</i>
15:10- 15:30	On-line non-intrusive measurement of particle size distribution for pulverised fuel using digital imaging techniques <i>Carter R M, Yan Y, Cameron S D</i>	The development of a miniaturised technique for measuring the leachability of toxic trace elements from co-combustion ash residues <i>George A, Dugwell D R, Kandiyoti R</i>
15:30- 15:50	Quantifying the shape of coal and biomass particles through digital imaging <i>Hobson D M, Carter R M, Yan Y</i>	Speciation of toxic trace elements in coal combustion products <i>Shah P, Strezov V, Prince K, Nelson P F</i>
15:50	Break	
16:30- 19:30	Poster session, (to include Buffet Dinner at 18:00).	

POSTERS

Monitoring and controlling pulverised coal burners

Tan O H, Hii N C, Tan C K, Chong A Z S, Wilcox S J, Ward J

Monitoring pulverised flows using acoustic emission

Tan O H, Hii N C, Tan C K, Chong A Z S, Wilcox S J, Ward J

Economic implications of oxyfuel application in a lignite-fired power plant

Kakaras E, Doukelis A, Giannakopoulos D, Koumanakos A

Co-liquefaction of coal with sugar cane crop residues

Primera E, Barraza J

Effect of catalysts in the quality of syngas and by-products obtained by co-gasification of coal and wastes

Gulyurtlu I, Pinto F, Lopes H, André R N, Cabrita I

Investigation of tar destruction reactions in a downdraft gasifier using biomass and waste feedstock

Monteiro Nunes S, Paterson N, Dugwell D R, Kandiyoti R

Features fluidization and burning of mixed anthracite culm and biogranules

Isemin R L, Konayachin V V, Maikhalev A V, Kondukov N B

Impact of co-firing coal with biomass on flame characteristics and stability

Lu G, Yan Y, Riley G

An investigation of the application of FLOX/COSTAIR burner to reduce NO_x emissions from coal power plant

Wang Y D, McIlveen-Wright D, Huang Y, Hewitt N, Eames P, Rezvani S, McMullan J

Characterisation of petroleum asphaltene by size exclusion chromatography, UV-fluorescence and mass spectrometry

Al-Muhareb E, Morgan T J, Herod A A, Kandiyoti R

Influence of high pressure on coal structure and properties

Slyusarev V V

Coal-biomass ash deposition during deeply-staged combustion

Wigley F, Williamson J, Riley G, Quick W

Behaviour of the elements introduced with the fuels in their distribution and immobilization between the coal-petroleum coke IGCC solid products

Alvarez-Rodríguez R, Clemente-Jul C, Martín-Rubí J A

On the activity of hydrocracking catalysts at short reaction times

Millan M, Adell C, Hinojosa C, Herod A A, Kandiyoti R

Catalytic effect of exchanged cobalt cation on the liquefaction of mixed coals

Sugano M, Shiomodaira K, Hirano K, Mashimo K

Coalbed methane in Ukraine

Alexeev A D, Vovchenko A P, Grinyov V G, Kuzmich O Yu

Characterisation of coal particles roping downstream double pipe elbows

Aroussi A, Roberts J, Rogers P

Design of an SO₃ air heater box in a coal-fired power station

Aroussi A, Roberts J

The possibility of harmonization of coal quality through coal homogenisation at Tamnava open pit mines and its impact on operation of thermal power plants

Mitrovic S, Vukotic D

CO₂ capture by adsorption with nitrogen-enriched materials

Plaza M G, Pevida C, Arenillas A, Rubiera F, Pis J J

Understanding the mechanisms behind coking pressure

Duffy J, Castro-Diaz M, Snape C E, Steel K M

Ignition characteristics of coal blends in an entrained flow furnace

Faúndez J, Arias B, Arenillas A, Rubiera F, García X, Gordon A L, Pis J J

Nature and characterisation of carbon deposits in industrial coke ovens

Barranco R, Patrick J W, Snape C E, Poultney R M, Diez M A, Barriocanal C

Impact of low-cost filler material on coke quality

Barranco R, Patrick J W, Snape C E, Thompson A W

Comparison of wall failure measurements obtained with the on-line wall friction tester and the Jenike wall friction tester.

Ratnaswamy Pillai J, Bradley M S A, Berry R J

Risk assesment of conveyor belts

Rumbak S

Wednesday, 6th September 2006

4A: Coal characterisation

9:00-9:20 Coal science: a melting pot for discovering and developing new analytical approaches

Snape C E

4B: Gasification I

Catalytic membrane reactor for ammonia decomposition from coal gasification streams

Koutsonikolas D, Topis S, Skodras G, Kaldis S, Sakellaropoulos G

9:20- Large molecules in the environment
9:40 detected by MALDI-MS and size exclusion chromatography

Herod A A, Al-Muhareb E, Morgan T J, Millan-Agorio M, Kandiyoti R

9:40- XPS study on the changes in functional
10:00 forms of the chlorine in coal

Tsubouchi N, Saito T, Sato M, Suzuki N, Ohtsuka Y

10:00- Quantisation of structural features in high
10:20 molecular mass (>5,000 μ) fractions of a coal tar pitch, by the use of nuclear magnetic resonance spectroscopy

Morgan T J, Davis D B, Herod A A, Kandiyoti R

10:20- Break

10:50

5A: Fouling, slagging, and ash I

10:50- Comparison of low temperature ash
11:10 deposition determined by theoretical and experimental method in coal gasifier conditions

Xu L-H, Jeon Y-S, Lee J-S, Kim H-T

11:10- Evolution of a spreadsheet-based model to
11:30 aid diagnosis of slagging and fouling problems in utility boilers

Syred N, Griffiths T, Gralton T, Wilcox S

11:30- New predictive tool for assessing slagging
11:50 behaviour of coal in boilers

Lawrence A, Narayanan K

11:50- An estimate of coal blend ashes tendency
12:10 to the fouling and slagging of boilers heating surfaces

Jovanovic M, Repic B, Mladenovic R, Crnomarkovic N

12:10- Lunch

13:40

6A: Emissions – organics, NOx and SO₂

13:40- Measurements of dioxin emissions during
14:00 co-firing in a fluidised bed

Gulyurtlu I, Crujeira A T, Abelha P, Cabrita I

14:00- Coal combustion modelling of large power
14:20 plants for NOx abatement

Le Bris T, Cadavid F, Caillat S, Pietrzyk S, Blondin J

14:20- Nitrogen precursors release from coal and
14:40 residues in fluidized bed

Abelha P, Gulyurtlu I, Cabrita I

Underground coal gasification – an R&D and commercial perspective

Green M, Courtney R

Development and reactivity tests of Ce-Zr bases Claus catalysts for coal gas cleanup

Park N-K, Han D C, Han G B, Ryu S O, Lee T J

Operational and research experience of ELCOGAS IGCC power plant

Coca P, Garcia Peña F

5B: Trace elements II

Metal sorbents for mercury, arsenic and selenium capture from fuel gas

Granite E J, Pennline H W, Myers C R, Stank D P, Hamilton H, Rowsell L, Poulston S, Chu W

Advanced gas purification technology for IGCC power plant

Charpentreau C, George A, Dugwell D R, Kandiyoti R

Mobilisation of trace elements from clean and ultra clean coals: predictions for Ba, Cd, Co, Mo, Nb, Sb, V, and W

Gibbs B M, Thompson D, Argent B B

The selection of low cost sorbents and process conditions for mercury capture from flue gases

Seneviratne H R, George A, Dugwell D R, Kandiyoti R

6B: Carbon capture and storage I

Sustainable clean coal power generation within a European context

Minchener A J, McMullan J T

Process simulation of an IGCC with CO₂ capture using the carbonation-calcination cycle

Klimantos P, Koukouzas N, Kakaras E

Initial evaluation of carbon capture plant flexibility: biomass co-firing and balancing renewable intermittency

Chalmers H, Flower M, Lucquiaud M, Gibbins J

14:40- Numerical modelling of PAHs formation
15:00 from coal combustion
You X F, Gorokhovski M, Chinnayya A

15:00- Break
15:30

7A: Coking and blast furnaces

15:30- Use of a high-pressure wire-mesh reactor to
15:50 study the behaviour of coal injected into
the blast furnace

Wu L, Paterson N, Dugwell D R, Kandiyoti R

15:50- A study of the fate of injectant coal in blast
16:10 furnaces: characterization of different
types of carbon

*Dong S, Wu L, Paterson N, Dugwell D R,
Kandiyoti R*

16:10- An approach to blast furnace coke quality
16:30 prediction

*Álvarez R, Díez M A, Barríocanal C, Díaz-
Faes M E, Cimadevilla J L G*

16:30- Influence of porosity and fissuring on
16:50 coking pressure

Casal M D, Barríocanal C, Díez M A, Álvarez R

19:00 **Conference dinner**
for
19:30

Technical and environmental assessment of coal
fired oxygen fed entrained flow IGCC power plants
with CO₂ capture

*Huang Y, Wang S, Rezvani S, McIlveen-Wright D,
Williams B C, Hewitt N*

7B: Co-firing II

Use of a novel two-stage system to model the time
temperature history in large utility boilers when
firing coal and coal/biomass blends

Syred N, Griffiths T, Abd-Rahman A

A three-level factorial design of experiment method
for analysing the co-combustion of coal with MSW
in CFBC plants

*Rezvani S, McIlveen-Wright D R, Huang Y, Hewitt N,
Wang Y*

Co-firing of coal and biomass in circulating fluidized
beds – influence of scale comparing 50 kW and 12
MW units

*Häsä H, Jegoroff M, Tourunen A, Saastomoinen J,
Jäntti T, Kettunen A, Johnsson F, Niklasson F, Pallarès D*

Co-firing pulverised coal with biomass in industrial
furnaces

Ma L, Pourkashanian M, Jones J M, Williams A

Thursday 7th September 2006

8A: Fouling, slagging, and ash II

9:00- Characterisation of CFB fly ash from
9:20 different solid fuels (bituminous coal, xylite
and wood chips): chemical and
mineralogical analyses – investigation of
the potential uses of CFB fly ashes

*Koukourzas N, Hämäläinen J, Papanikolaou
D, Tourunen A, Jäntti T*

9:20- Flyash beneficiation using microwaves
9:40

Kingman S, Lester E, Dodds C

9:40- Ash deposition at higher levels of coal
10:00 replacement by biomass

Wigley F, Williamson J, Malmgren A, Riley G

8B: Gasification II

A study of the reaction chemistry in the production
of hydrogen from coal using a novel process concept

Lu G, Paterson N, Dugwell D R, Kandiyoti R

Characterisation of residual carbon from entrained-bed
CWS gasifiers

Wu T, Gong M, Lester E, Wang F, Zhou Z

An investigation of the reactivity of chars formed in
fluidised bed gasifiers: the effect of reaction
conditions and particle size on coal char reactivity

McLisky A, Paterson N, Dugwell D R, Kandiyoti R

10:00- Criteria selection for the assessment of
10:20 Serbian lignites tendency to form deposits
on power boilers heat transfer surfaces
Mladenovic M, Mladenovic R, Manovic V
10:20- Break
10:50

9A: Preparation and blending

10:50- Mixed plastic wastes as additives to coal
11:10 blends for metallurgical coke production
*Melendi S, Barriocanal C, Alvarez R, Díez
M A*
11:10- Microwave pretreatment of coal to improve
11:30 grindability
Lester E, Kingman S, Wu T, Matthews J
11:30- Demineralization of a UK bituminous coal
11:50 using HF and ferric ions
Wu Z, Steel K
11:50- Closing address : *Prof J S Harrison*
12:00
12:00- Lunch
13:30

Pseudo steady state packed bed model for
underground coal gasification
Khadse A, Qayyumi M, Mahjani S, Aghalayam P

9B: Carbon capture and storage II

Comparative assessment of conventional versus
advanced supercritical oxy-fuel fired PF boilers with
CO₂ sequestration facilities
*Rezvani S, Huang Y, McIlveen-Wright D, Hewitt N,
Wang Y*
Oxyfuel boiler design in a lignite-fired power plant
*Kakaras E, Koumanakos A, Doukelis A,
Giannakopoulos D*
Initial assessment of the potential CO₂ storage
capacity in Serbia
Vukotic D, Milosevic J

