PROGRAMME

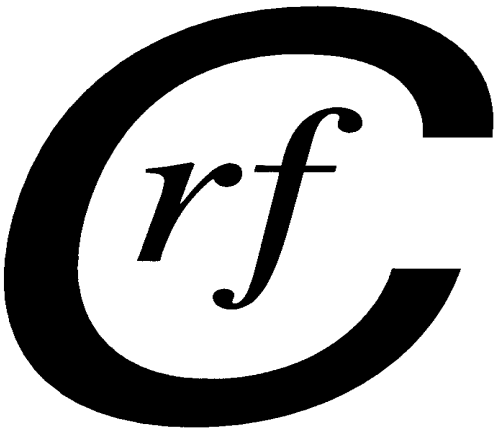
6th EUROPEAN CONFERENCE ON COAL RESEARCH & ITS APPLICATIONS

Organised by the Coal Research Forum

http://www.coalresearchforum.org

Sponsored by

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



5th – 7th September 2006

University of Kent
Grimond Building
Canterbury
Kent
UK

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 mediaeval 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).

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, CO_2 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

If further information is required please contact:
Dr Alan W Thompson,
School of Chemical, Environmental & Mining Engineering,
University of Nottingham,
University Park,
Nottingham, NG7 2RD,
UK.
Tel: +44 (0) 115 951 4198
Fax: +44 (0) 115 951 4115
e-mail: alan.thompson@nottingham.ac.uk

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 Dr A.N. Other

	1A: Monitoring, control and modelling I	1B: Combustion
10:10-10:30	On-line fuel tracking by advanced flame monitoring – demonstration trials at a full scale power station *Xu L, Carter R M, Yan Y, Cornwell S , Riley G S*	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*
10:30-10:50	Modelling and experimental validation of electrostatic sensors for pulverised fuel flow monitoring *Krabicka J, Carter R M, Yan Y*	The operational comparison of a modern European 2 x 110 MWe CFB power plant against other typical coal fired stations *Mould S*
10:50-11:10	How to balance pneumatically conveyed fuel supply to burners in power stations *Aroussi A*	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*
11:10-11:40	Break	
	2A: Monitoring, control and modelling II	**2B: Co-firing I**
11:40-12:00	Computer modelling of the combined effects of plant conditions and coal quality on burnout in utility furnaces *Stephenson P L*	Pyrolysis kinetics and combustion characteristics of waste recovered fuels *Skodras G, Grammelis P, Basinas P, Sakellaropoulos G P*
12:00-12:20	Monitoring, modelling and controlling stoker-fired boiler plant *Thai S M, Wilcox S J, Ward J*	Biomass co-firing – the effect of biomass injection methods on combustion and environmental performance *Beeley T J, Whitehouse M, Malmgren A, Riley G S*
12:20-12:40	Development of fragmentation models for solid fuel combustion and gasification as sub-routines for inclusion in CFD code *Syred N*	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*
12:40-13:00	Power plant performance model using on-line coal analysis *Munukutla S*	Impact of biomass co-combustion and combustion conditions on mercury partitioning at Kingsnorth Power Station, UK *Quick W J, Corns W R, Tembrink J, Clieplik M, Therwarth H, Bowden S*
13:00-14:30	Lunch	
	3A: Image processing	**3B: Trace elements I**
14:30-14:50	Three-dimensional measurement of flame temperature through optical process	Mercury and selenium retention in fly ashes: influence of unburned particle content

	tomography *Gilabert G, Lu G, Yan Y, Cornwell S*	*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 *Wu T, Lester E, Gong M, Thompson A, Aquino Z*	On-line monitoring of boron in coal-fired power plant wastewaters on automated measuring equipment with ion-selective methods *Abe K, Ohyama S, Miyazaki N*
15:10-15:30	On-line non-intrusive measurement of particle size distribution for pulverised fuel using digital imaging techniques *Carter R M, Yan Y, Cameron S D*	The development of a miniaturised technique for measuring the leachability of toxic trace elements from co-combustion ash residues *George A, Dugwell D R, Kandiyoti R*
15:30-15:50	Quantifying the shape of coal and biomass particles through digital imaging *Hobson D M, Carter R M, Yan Y*	Speciation of toxic trace elements in coal combustion products *Shah P, Strezov V, Prince K, Nelson P F*
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

Features fluidization and burning of mixes 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

An investigation of the application of FLOX/COSTAIR burner to reduce NOx emissions from coal power plant
Wang Y D, McIlveen-Wright D, Huang Y, Hewitt N, Eames P, Rezvani S, McMullan J

Characterisation of petroleum asphaltenes 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 SO_3 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

CO_2 capture by adsorption with nitrogen enriched materials
Plaza MG, Pevida C, Arenillas A, Rubiera F, Pis JJ

Understanding the mechanisms behind coking pressure
Duffy J, Castro-Diaz M, Snape CE, Steel KM

Ignition characteristics of coal blends in an entrained flow furnace
Faúndez J, Arias B, Arenillas A, Rubiera F, García X, Gordon AL, Pis JJ

Nature and Characterisation of Carbon Deposits in Industrial Coke Ovens
Barranco R, Patrick JW, Snape CE, Poultney RM, Diez MA, Barriocanal C

Impact of Low-cost Filler Material on Coke Quality
Barranco R, Patrick JW, Snape CE, Thompson AW

Comparison of wall failure measurements obtained with the on-line wall friction tester and the Jenike wall friction tester.
Ratnaswamy Pillai J, Bradley MSA, Berry RJ

Wednesday, 6th September 2006

	4A: Coal characterisation	4B: Gasification I
9:00-9:20	Coal science: a melting pot for discovering and developing new analytical approaches *Snape C E*	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	Underground coal gasification – an R&D and

9:40	detected by MALDI-MS and size exclusion chromatography *Herod A A, Al-Muhareb E, Morgan T J, Millan-Agorio M, Kandiyoti R*	commercial perspective *Green M, Courtney R*
9:40-10:00	XPS study on the changes in functional forms of the chlorine in coal *Tsubouchi N, Saito T, Sato M, Suzuki N, Ohtsuka Y*	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*
10:00-10:20	Quantisation of structural features in high 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*	Operational and research experience of ELCOGAS IGCC power plant *Coca P, Garcia Peña F*
10:20-10:50	Break	

	5A: Fouling, slagging, and ash I	**5B: Trace elements II**
10:50-11:10	Comparison of low temperature ash deposition determined by theoretical and experimental method in coal gasifier conditions *Xu L-H, Jeon Y-S, Lee J-S. Kim H-T*	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*
11:10-11:30	Evolution of a spreadsheet-based model to aid diagnosis of slagging and fouling problems in utility boilers *Syred N, Griffiths T, Gralton T, Wilcox S*	Advanced gas purification technology for IGCC power plant *Charpentreau C, George A, Dugwell D R, Kandiyoti R*
11:30-11:50	New predictive tool for assessing slagging behaviour of coal in boilers *Lawrence A, Narayanan K*	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*
11:50-12:10	An estimate of coal blend ashes tendency to the fouling and slagging of boilers heating surfaces *Jovanovic M, Repic B, Mladenovic R, Crnomarkovic N*	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*
12:10-13:40	Lunch	

	6A: Emissions – organics, NOx and SO_2	**6B: Carbon capture and storage I**
13:40-14:00	Measurements of dioxin emissions during co-firing in a fluidised bed *Gulyurtlu I, Crujeira A T, Abelha P, Cabrita I*	Sustainable clean coal power generation within a European context *Minchener A J, McMullan J T*
14:00-14:20	Coal combustion modelling of large power plants for NOx abatement *Le Bris T, Cadavid F, Caillat S, Pietrzyk S, Blondin J*	Process simulation of an IGCC with CO_2 capture using the carbonation-calcination cycle *Klimantos P, Koukouzas N, Kakaras E*
14:20-14:40	Nitrogen precursors release from coal and residues in fluidized bed *Abelha P, Gulyurtlu I, Cabrita I*	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	Technical and environmental assessment of coal

15:00	from coal combustion *You X F, Gorokhovski M, Chinnayya A*	fired oxygen fed entrained flow IGCC power plants with CO_2 capture *Huang Y, Wang S, Rezvani S, McIlveen-Wright D, Williams B C, Hewitt N*
15:00-15:30	Break	

	7A: Coking and blast furnaces	7B: Co-firing II
15:30-15:50	Use of a high-pressure wire-mesh reactor to study the behaviour of coal injected into the blast furnace *Wu L, Paterson N, Dugwell D R, Kandiyoti R*	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*
15:50-16:10	A study of the fate of injectant coal in blast furnaces: characterization of different types of carbon *Dong S, Wu L, Paterson N, Dugwell D R, Kandiyoti R*	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*
16:10-16:30	An approach to blast furnace coke quality prediction *Àlvarez R, Díez M A, Barríocanal C, Díaz-Faes M E, Cimadevilla J L G*	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*
16:30-16:50	Influence of porosity and fissuring on coking pressure *Casal M D, Barríocanal C, Díez M A, Àlvarez R*	Co-firing pulverised coal with biomass in industrial furnaces *Ma L, Pourkashanian M, Jones J M, Williams A*

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

Thursday 7th September 2006

	8A: Fouling, slagging, and ash II	8B: Gasification II
9:00-9:20	Characterisation of CFB fly ash from different solid fuels (bituminous coal, xylite and wood chips): chemical and mineralogical analyses – investigation of the potential uses of CFB fly ashes *Koukouzas N, Hämäläinen J, Papanikolaou D, Tourunen A, Jäntti T*	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*
9:20-9:40	Flyash beneficiation using microwaves *Kingman S, Lester E, Dodds C*	Characterisation of residual carbon from entrained-bed CWS gasifiers *Wu T, Gong M, Lester E, Wang F, Zhou Z*
9:40-10:00	Ash deposition at higher levels of coal replacement by biomass	An investigation of the reactivity of chars formed in fluidised bed gasifiers: the effect of

	Wigley F, Williamson J, Malmgren A, Riley G	reaction conditions and particle size on coal char reactivity *McLisky A, Paterson N, Dugwell D R, Kandiyoti R*
10:00-10:20	Criteria selection for the assessment of Serbian lignites tendency to form deposits on power boilers heat transfer surfaces *Mladenovic M, Mladenovic R, Manovic V*	Pseudo steady state packed bed model for underground coal gasification *Khadse A, Qayyumi M, Mahjani S, Aghalayam P*
10:20-10:50	Break	
	9A: Preparation and blending	**9B: Carbon capture and storage II**
10:50-11:10	Mixed plastic wastes as additives to coal blends for metallurgical coke production *Melendi S, Barríocanal C, Àlvarez R, Díez M A*	Comparative assessment of conventional versus advanced supercritical oxy-fuel fired PF boilers with CO_2 sequestration facilities *Rezvani S, Huang Y, McIlveen-Wright D, Hewitt N, Wang Y*
11:10-11:30	Microwave pretreatment of coal to improve grindability *Lester E, Kingman S, Wu T, Matthews J*	Oxyfuel boiler design in a lignite-fired power plant *Kakaras E, Koumanakos A, Doukelis A, Giannakopoulos* D
11:30-11:50	Demineralization of a UK bituminous coal using HF and ferric ions *Wu Z, Steel K*	Initial assessment of the potential CO_2 storage capacity in Serbia *Vukotic D, Milosevic J*
11:50-12:00	Closing address : *Prof J S Harrison*	
12:00-13:30	Lunch	