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NEWSLETTER

of the Coal Research Forum

EDITOR'S COMMENTS:

The time has come once again to wish all of our readers on behalf of the committee of the Coal Research Forum a happy and peaceful Christmas and a successful and rewarding New Year.

Looking outside from my window as I search for inspiration to offer something new and different in my New Year Message all I see is snow piled high and shivering sparrows in the trees. Now I know it is winter and I know we as a nation always seem to get taken by surprise by the appearance of white flakes from the sky but, come on! it is still early December. Can it be that there really is something in all of this talk about global warming? If, as seems to be the case there is, the current weather should put an end to it being called global warming – I think 'disruptive climate change' is much better! Seriously, though, it is rather worrying to hear that with temperatures of 0-10^{O}C, which rapidly seem to be coming 'normal', that frozen roads seem destined to stay that way as once iced over they appear to be unaffected by salt. I hope there are alternatives as the winters end still seems a long way off!

To cheerier things I am happy to report that the 8th ECCRIA held in Leeds was a resounding success and many thanks to all who were involved in its organisation. You will find a number of short accounts of the impressions of some of the attendees to the conference in this newsletter

We have also held a number of well-attended meetings during this quarter which are reported in the newsletter so it seems that we are continuing to offer what people want to hear about, which is gratifying.

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8th European Conference on Coal Research & its Applications (8th ECCRIA)

5th-8th September 2010
University of Leeds

The "8th European Conference on Coal Research and its Applications" was the eighth in this series of three day Conferences organised by the Coal Research Forum, which are held every two years. This Conference has continued the success of the previous Conferences in this series, which have continued to grow in size and popularity since the inaugural Conference in 1996. This year's Conference continued this success and attracted an increasing representation from delegates from organisations worldwide. The Conference was held at the University of Leeds in September 2010 and covered all aspects of coal utilisation research currently being carried out in the UK and had many contributions from presenters worldwide. There were participants from all of the major UK organisations, both from industry and academe, carrying out coal R&D and the Conference was attended by just over 130 participants. More than a third of the participants were from overseas, representing 18 countries worldwide. The conference had almost 80 oral presentations, which were presented in two parallel sessions, as well as over 30 poster presentations. Overall, this Conference was one of the most successful in this series of conferences held so far and preparations are currently beginning for the 9th ECCRIA in 2012.

Impressions of the 8th ECCRIA

From Adekola Lawal of Cranfield University

The 8th European Conference on Coal Research and its Applications: ECCRIA 8 was my first time in Leeds and was a pleasant experience from start to finish. The organizers provided loads of information about the conference early and this made preparation quite easy. The new conference website was also very helpful and I must have visited it several times for information about the programme, submitting abstracts, registration and the venue.

The conference attracted professionals from as far as Japan, South Korea and Australia. This speaks volumes about its relevance. It was an opportunity for young professionals to network with experts from around the world. I was delighted to meet acquaintances from ECCRIA 7 in Cardiff and had the pleasure of meeting many more. I believe there were more young professionals at the conference this year and I certainly met more people working in a similar research area this year.

There was a wider range of topics covered in lectures with Carbon Capture and Storage receiving a lot more coverage. Indeed, the conference is successfully moving with the developments in the industry. The talks were of a very high standard and were interesting. There was a good mix of talks from Universities and industry. As a Process Engineer, I left the conference with a greater appreciation of coal applications and with lots of new ideas to implement in my research. I also found the Health and Safety Laboratory talk quite useful and important. The breaks provided a good opportunity to discuss with the speakers one-on-one. In some cases, more time after the talk was needed for questions. One recommendation I heard and agree with is that a short period could be arranged for a general discussion after a session.

The Conference dinner and tour of the Royal Armouries was intriguing. The museum had an amazing array displayed and the demonstration given was quite interesting. Eating in the midst of all that history made the dinner even more special! It was a great night overall.

The organizers did an extremely good job putting these all together. Everyone (at the accommodation and conference venue) was helpful and very friendly, the coach service to and from the accommodation was very handy. The plan to upload presentations on the website is a welcome development indeed. In all, I think the conference was a big success.

From Claudio Avila of the University of Nottingham

It was a memorable and thoroughly enjoyable conference, with a good selection of panel topics and panel participants from several universities, institutes and industries, giving a unique chance to contrast opinions from different actors of the coal world in UK and Europe.

As usual, the ECCRIA conference has presented a really interesting opportunity for young students to meet experienced scientists and receive valuable feedback about their projects. Additionally, it was a valuable opportunity for networking between university projects and industrial partners, which play a significant role in the implementation of these studies at industrial scale.

About the technical sessions, it could not start better. The information given in the opening session was wonderful, focused in the funding of projects by the European Commission for Coal and Steel Research that is helpful information in spending cuts times.
In the co-firing session called my attention a presentation given by Cheng Heng Pang from the University of Nottingham, in which he exposed about the behaviour of coal ash under a change of temperature, using a high temperature video camera, presenting a modified method to quantify the ash slagging in boilers.

In the second day, several carbon capture issues were introduced in the discussion. For me, the implementation of a credible CCS demonstration plant up and running is still a mystery unsolved, but work is in process and hopefully we will see this soon (by the next ECCRIA conference?). Also related to this subject, a presentation given by a researcher from INCAR-Spain, Mara Olivares, introduced the idea of using carpet waste as a precursor of activated carbon for CO_2 sequestration, showing in her results that the absorption capacity of this material is double than these obtained for activated carbon produced from raw coal. It is an important opportunity to use a massive residue of UK to target a very specific problem that is the storage of this greenhouse gas.

About Oxyfuel combustion, again it has been on the focus of attention, showing to be a feasible alternative to improve efficiencies in the power industry and a key to facilitate the implementation of carbon capture and storage needed to meet the environmental targets. However, for some miscellaneous materials such as biomass and waste, more study is still needed in particle characterization, which considers the morphology and reactivity of char particles behaviour under this kind of conditions.

In general, the conference was vast and diverse, with a high scientific standard but also targeting practical applications, which made this area so dynamic. Overall, from my point of view it has been a complete success. It just remains to congratulate the organizers, which made a really good effort to exceed our expectations, especially with this magnificent dinner at the Royal Armouries Museum (for many people a unique experience).

From Cheng Heng Pang of the University of Nottingham

The 8th European Conference on Coal Research and Its Applications held in the University of Leeds on the 6-8 of September 2010 was, in my opinion a great success. There are many reasons for that statement. The most obvious reason being the high attendance rate and the involvement of participants from various countries across the globe. Whether or not it was intended, but the talks given by various speakers were as though they were catering for the different crowds, some of which were experienced experts, some of which were new comers. The most valuable experience was the discussion amongst researchers during the breaks/lunch/dinner where constructive criticisms were never lacking. More often than not, encouraging words proved to be doing its duty for young researchers like me.

One of the highlights of the conference was the dinner at the Royal Armouries Museum. The atmosphere was fantastic. Dining while being surrounded by historical and meaningful artefacts/items was a memorable experience. Given such a good location for dinner, I doubt anyone paid much attention to the food.

All in all, it was a fun and learning experience.

From Mohamed Ismail of the University of Nottingham

The event of the 8th European Conference on Coal Research and Its Applications was a new experience for me as a PhD student in my first International Conference.

The conference was very well organised. There were two sessions, oral presentations and a poster session. It was a unique chance for me in which I presented my work to a professional audience who were interested and interacted with my topic. Moreover, I discussed in detail the technical aspects of my work with other researchers of different disciplines and at the same time I received useful feedback which enabled me to develop new ideas to enhance my work. Additionally it was a golden opportunity for me to interact with experts and professional researchers in my area, there were opportunities to establish links of communication with them.

There were many topics of interest to me in particular such as the session on Coal derived products.

The venue was ideal; Leeds is a modern and an industrial city. The conference was well organized in terms of activities and social events. I found that the Royal Armouries museum in Leeds to be the most fascinating place. I was very grateful for the welcome and hospitality of all those involved.

From Alan Thompson of E.ON New Build & Technology Ltd.

This was for me an opportunity to attend the conference as an 'outsider' as having been involved in the organisation of a number of previous conferences somewhat obscured my overall view of the event. I was unable to attend the full conference due to other commitments only arriving on the Tuesday evening. My first impressions of the location of the Halls of Residence were good in that they are located close to the pleasant surroundings of the re-developed Gladstone Dock. Checking in to find that I had a room booked was another pleasure not always found in certain previous conferences, (as David McCaffrey will attest to)!

It was only a short walk to the Royal Armouries Museum which turned out to be a stunning location for the Conference Dinner. The display of arms and militaria was very impressive and following a demonstration by two of the staff I am now able to fit myself with a suit of armour as long as my squire is there to help me. There followed a really excellent dinner and the conversation and wine flowed at a relaxed and enjoyable pace.

Next morning following breakfast the bus to the campus ensured I was there in time to chair one of the first sessions of the day. This session on the last day and after the conference dinner is often a slow starter as people shuffle quietly into the lecture theatre holding their heads! However, my concerns as chairman over the functioning of the AV equipment and the appearance of the presenters were unfounded and we started on time to a gratifyingly large session given the circumstances. The session went well and after coffee we were into the home straight. Soon the conference was drawing to a close and the thanks were given by John Patrick. A good substantial lunch followed which ensured that the attendees were sent off with full bellies and hopefully satisfied with time spent at another interesting and useful CRF conference.

On a personal note I can only say how much I enjoyed my albeit brief attendance at the conference. The organisation was really first class and I am sure that this conference sets a standard that future ECCRIA's will have to work hard to match.

BCURA 2010 Robens Coal Science Lecture
Institute of Physics
London

11th October 2010

The 59th BCURA Robens Coal Science Lecture took place on 11th October 2010 at the Institute of Physics in London, where the some 130 participants met and mingled for tea and coffee prior to this presentation. The Lecture this year was given by Dr Will Gibb of E.ON New Build & technology. Like all of the presenters of the BCURA Coal Science Lectures, Will was a very well known expert in his field having worked for the CEGB, and successor companies Powergen and latterly E.ON.

Will began his talk by explaining that the 35 years he had spent in coal science helping to ensure that coals could be fired successfully for electricity generation could be divided into pre- and post privatisation periods with the dividing line being in 1990. The pre-1990 era was characterised by the burning of solely UK coals in power stations which had been designed for such a diet of fuels. The major problem areas encountered during this period were ash deposition and corrosion resulting from the high chlorine levels in most British coals. The post-1990 era was where imported coals from a variety of locations were trialled and a different range of potential problem areas had to be addressed. This situation was accompanied by an ever decreasing limit on pollutant emissions.

A number of interesting comparisons could be made between the time when Will joined the CEGB (1972) and now. In 1972 there were 180 operational mines and the coal use for power was around 80 million tonnes. In 2010 there are now 4 underground mines and coal consumption in 2008 was around 48 million tonnes. 60% of coal consumed in power generation is now imported.

Will summarised the basis chemistry and composition of coal explaining its formation and how its age affected coal rank.

One of the main problem areas with UK coals had been boiler slagging. This is the build up of deposits in the radiant section of boilers and is caused by the build up of molten and sticky particles which then coalesce. Coals with high levels of iron, calcium and sodium were found to be most prone to slagging.

It was the lack of a credible predictive capability for this phenomenon which resulted in a major study known as the UK Ash Deposition Programme. The project, which ran from 1991 to 1994, was a good early example of how data from three different scales could be obtained and used. Full-size plant trials, pilot plant testing and laboratory studies on the same coals were performed and data compared. The project was able to help develop CCSEM (computer-controlled scanning electron microscopy) at one of the partner universities, Imperial College London which proved to be very valuable in helping to interpret observed behaviour. This technique allowed the elemental analysis of very small individual particles both in the coal, fly ash and deposits thereby helping to understand the roles of different mineral compositions. This work led to a more accurate predictive tool to assess slagging potential in coals.

Fireside corrosion had been a serious problem in the 1970's and 1980's and work led to the understanding of two mechanisms of the corrosion of mild steel furnace wall tubing and

austenitic superheater and reheater tubing. However, in both cases the cause of the corrosion was identified as being due to the high levels of chlorine in the coals.

At this time it had proved difficult to replicate the morphology of deposits from plant failures in the laboratory due to the relative shortness of laboratory trials and the inability to reproduce the plant cyclic temperature and atmospheric environments. However, the acquisition of the CTF (Combustion Test facility) at Ratcliffe allowed new insights to be gained on the mechanisms and allowed realistic test conditions to be recreated in a more controlled manner. The design of the CTF allowed in a relatively short time, typically 50 hours, a measurable corrosion rate to be established. In addition the array of corrosion probes allowed the simultaneous measurement of key variables during a single run. These include the local gaseous environment, reducing, semi-reducing or oxidising; heat flux and metal temperature. Predictive equations were developed and found to be useful in estimation corrosion rates.

After 1990 when privatisation occurred the emphasis changed from plant availability to cost. The availability of cheap imported coals with low sulphur content led to their introduction on UK power stations. At the same time there were tighter emission targets for the reduction of nitrogen (NOx) and sulphur (SOx) oxide emissions, the improvement in carbon burnout, lower dust emissions and a need to investigate mercury emissions.

NOx emissions from the fitting of low NOx burners (LNB) were known to be linked to decreased carbon burnout. This results from the staging of combustion, which is a process whereby nitrogen in the coal is volatilised in a non-oxidising zone. Although this lowers the NOx emissions, carbon in fly ash almost invariably increases.

High levels of unburnt carbon are also unacceptable in that they represent a loss of calorific value and can adversely affect the performance of electrostatic precipitators and thus lead to high dust emission levels and unsaleable fly ash.

Laboratory scale testing showed that the NOx emissions were linked to the volatile matter and nitrogen content of the coals. High volatile content helped to evolve nitrogen from the coal and thus lower NOx emissions. In general terms, a high volatile matter and low nitrogen content coal would be expected to give the lowest NOx emissions although there are other factors involved and NOx is not simple to predict. Equally, carbon burnout is a complex phenomenon and E.ON entered into a research exercise with the University of Nottingham to investigate the effect of coal petrology on burnout. Petrology is a science which deals with the origin, history, occurrence, structure, chemical composition, and classification of coal. It was established that certain components in unburnt coal, known as macerals, produce consistent char structures whose combustion characteristics were known. Image analysis data of the coals, their chars and the carbon from fly ash were examined. In simple terms, what followed was that by analysis of the unburnt coal it was possible to make a prediction of the likely burnout behaviour of an unknown coal. This technique proved to be extremely useful at predicting burnout behaviour and also at identifying coal blends and possible contamination. The latter benefits are not being easily obtained from other methods.

The final segment of Will's talk focused on mercury. Interest in mercury arises from its extreme toxicity to humans. Mercury can exist in the atmosphere as the element, as inorganic salts or organic molecules.

Mercury is present in coal at a very low level (0.02 to 0.25ppm) but is a problem as it is so volatile and is quickly vaporised upon combustion. These mercury levels in coal are equivalent to about 2 to 25 $\mu g/m^3$. Although these are low concentrations there is a threat that mercury emission levels in flue gas could be subject to an enforced upper limit of $3\mu g/m^3$. Mercury has therefore to be trapped during the overall combustion process and this is where much work has been undertaken to demonstrate the extent to which it is possible.

Coal-fired plant without flue-gas desulphurisation (FGD) is believed to retain 50% of the mercury, however, FGD-fitted plant can retain 75% due to absorption of oxidised mercury. If selective catalytic reduction (SCR) is also fitted then the retention is of the order of 90%. Carbon and oxidising agents such as chlorine are known to enhance mercury retention.

The measurement of mercury in combustion systems is very difficult due to low levels of mercury, different mercury species and having to sample from a dust-laden flue gas stream. Speciation of mercury is also complex although the measurement of total mercury levels are not so challenging. Instrumental analysis is possible but expensive but as yet unproven.

Will moved closer to today by mentioning carbon capture and storage (CCS) and the role Oxyfuel firing has to play in helping to achieve this. He identified the outstanding R&D needs which included safety issues, the effect on ash chemistry, burnout and corrosion.

In conclusion Will summarised his talk by averring that there will undoubtedly be a place for coal fired power generation in the future and that there will, as a result, be a continuing need for fundamental and applied coal R&D. The three reasons he gave for this were changing emission limit values for existing plant, coal supply changes and new technologies.

The event concluded with the traditional buffet dinner, which gave the participants an opportunity to discuss and catch up on recent developments and events.

"Who will keep the lights on?"

Joint seminar of the Coal Research Forum (Coal Preparation Division), the Mineral Engineering Society Southern Group and the South Midlands Institute of Materials, Minerals and Mining

14th – 15th October 2010
Hilton Hotel, Nottingham

The Minerals Engineering Society, with support from Midlands Institute of Mining Engineers and the Coal Research Forum, organised a very successful two day Symposium in October 2010 based at the Hilton Hotel, Nottingham. There were 30 full time delegates and a good number of day delegates each day who were able to appreciate a first rate event with some outstanding speakers to discuss the issue of "Who will keep the lights on". Unfortunately neither the Government or Regulatory bodies attended, is it any wonder the energy scene in the UK is in such disarray.

The Symposium was opened by Greg Kelley, President of the MES and the session Chairmen were drawn from the three organisations with Des Redmond for the MES, John Dickinson from MIME and Professor John Patrick from the CRF. It is to their great credit that all three did an excellent job in their particular session and controlled both the speakers and very interesting and robust question times very well.

There were 12 papers presented that attempted to cover all the main aspects of power generation in the UK and show what each had to offer in terms of answering the question posed, the papers and speakers are listed below: -

"The UK Energy Scene"Jeremy Nicholson, Energy Intensive Users Group
"Ratcliffe Power Station Environmental Upgrade"Nigel Bates, Eon
"Improving Efficiency of Coal Fired Plants"Dr Jacob Roberts, Greenbank Group
"Biomass/Biofuels"Robert Kennedy, Hargreaves Rocfuels
"ITI Gassifier-Energy from Waste"Tony Fordham, ITI Energy
"Tidal Energy"Neil Kermode, EMEC

"Scaling up Renewables"Professor Garvey, Nottingham University
"Carbon Capture & Storage for the future"Derek Hastings, Scottish Power
"Nuclear Energy for the future in the UK"Malcolm Grimston, Imperial College & Chatham House
"Nuclear Generation in the UK"Mark Salisbury, Horizon Nuclear Energy
"Nuclear Waste Storage"Dr Nick Evans, Loughborough University
"Decommissioning Nuclear Plant"Andrew Scargill, Jordan Nuclear

To allow the delegates more time for discussion a dinner was organised for the Thursday evening when 9 of the speakers joined the full time delegates and organisers when they were also addressed by Roger Helmer, MEP who gave the view from Brussels and then entertained by Paul Sinha, a local after dinner speaker from the Ashby area.

Contribution prepared by Mr. Andrew Howells.

"Technical and Economic Aspects of Co-firing of Biomass",

Joint Meeting of the Coal Research Forum, Combustion Division and the Royal Society of Chemistry Energy Sector

10th November 2010
School of Electronic and Electrical Engineering, University of Leeds , Leeds

The chair of the morning session, Prof Mohamed Poukashanian welcomed participants to Leeds University and the first speaker Jeremy Tomkinson from NNFCC at York. Dr Tomkinson gave an excellent overview of the current situation regarding biomass policy in the UK, highlighting the stringent UK national target of 15% renewables (equivalent to 240TWh) as specified in the Renewable Energy Directive and the various policy mechanisms to encourage the uptake of renewables – which are surprisingly inconsistent in terms of incentives. Biomethane injection into the NTS was considered to be the most attractive system with no major changes required to infrastructure. Biomass to liquid fuel conversion technologies were also presented with some promoters suggesting that in time they will produce equivalent fuels cheaper than current fossil liquid fuels. It was noted that feedstock is key when assessing LCA for renewables technologies – waste feedstocks are often the lowest. Dr Tomkinson concluded by expressing that immediate action was needed by Government/stakeholders on developing the Biomass Supply Chain, market enabling structures to offset risk and access to waste feedstocks.

The second lecture was given by Steve Critchley of REA on Biomass Sustainability Regulation & Reporting. The Renewable Energy Directive (RED) gives mandatory standards on sustainability with five requirements raging from chain of custody/audit to restrictions on the type of land that can be used for biomass cultivation. However there is no EU wide mandatory scheme – and member states have therefore set up their own schemes. Several key terms in the sustainability criteria still have to be defined and an EU committee has been formed to address this. Under the 2011 RO there will be annual mandatory sustainability reporting from 2011, with sustainable compliance for ROCs from 2013 – under the RO there is broad compliance with the RED. The presentation ended with key messages from a DECC/stakeholder meeting held just 10 days previously.

Lesley Sloss (IEA CCC) gave a comprehensive overview on the impact of biomass co-firing on emissions, which tend to be reduced with increased biomass use. However, there are a huge variety of biomass types available with very different chemical properties to coal, so there will always be exceptions to the rule. Dr Sloss presented evidence of synergistic effects of co-firing biomass on NOx, as well as data suggesting that particle size of dust increases when co-firing with certain biomass types. The impact on byproducts (ash) was also discussed and since 2005, BS EN 450 has recognised that ash from cofiring can be accepted as long as biomass is <20% by mass of fuel and the contribution is less than 10% of ash weight. It was noted that in the UK,

recent work by the Utilities, the EA and the WRAP will allow an additional 300kte of ash to be used without the need for special permits. However, in the US legislation appears to be getting more stringent, following recent events including breaches of ash lagoons.

Colin Snape (Nottingham University) provided an overview of the EPSRC EngD Centre and provided details on the five EngD projects related to biomass currently running at Nottingham. These projects include the impact of storage on biomass quality and handleability, with large-scale indoor and outdoor exposure testing planned. Two further projects on biomass combustion are ongoing, as well as one on torrefaction and one on biomass incorporation into smokeless fuels. Prof Snape also presented work on combustion enhancing additives suggesting that alkali and alkaline earth metals are effective catalysts – meaning that co-firing biomass (generally containing high levels of these elements compared to coal) could enhance combustion, TGA data was provided to support this claim. Prof Snape concluded by presenting some recent work on liquid solvent extraction of biomass.

Following an excellent buffet lunch and a break during which the Royal Society of Chemistry Energy Sector held its AGM, Dr. Will Quick welcomed delegates back to the afternoon session. The first speaker Dr. Nigel Burdett gave a highly informative talk on the development of the 500MW co-firing facility at Drax Power Station. Drax has the capacity for up to 100MW 'through the mill' co-firing together with up to 400MW direct injection of biomass, making it the worlds largest co-firing facility. Significant effort has been focussed on the supply chain, with a dedicated road and rail unloading facility, and dedicated (covered) rail wagons. Over 20kte of storage is available on site, whilst Drax have also funded a 100kte pa pelleting plant in Goole. On a life cycle basis, the environmental credentials of co-firing biomass with coal were compared with other methods of generation including CCGT, with the conclusion that natural gas is not as 'green' in terms of carbon intensity as one might first believe.

Dr Bill Livingston (Doosan Babcock Energy) presented a general introduction to the main biomass types used by utilities, including pre-treatment options. Quality control of the biomass feedstock was considered to be an important issue. Dr Livingston discussed the various options for co-firing biomass including co-milling, direct injection and gasification. The key risk to boiler performance was considered to be related to the ash chemistry of the biomass which needs careful consideration in the fuel specification as well as potential modification to boiler design and operation.

The final speaker Prof Jenny Jones (Leeds University) gave a general introduction to the scale and scope of biomass co-firing in the UK at present, followed by a closer look at related research projects being undertaken at Leeds University, including work on characterisation and combustion of biomass, torrefaction of biomass and work investigating biomass markets. In line with Dr Livingston's earlier comment, the ash behaviour of biomass was of particular interest with evidence of clustering of behaviour for similar biomass types. 'Tailoring' of energy crop to produce material with optimal composition is possible, with time of harvest and fertiliser application particularly relevant to optimising ash chemistry. Significant work has been undertaken at Leeds on torrefaction, which potentially offers a more stable and grindable biomass product.

The meeting concluded with a general discussion chaired by Prof Poukashanian involving the remaining speakers and the audience on key issues in biomass utilisation in large-scale power generation.

Contribution prepared by Dr. Will Quick.

The Advanced Power Generation Technology Forum

The Advanced Power Generation Technology Forum (APGTF), originally known as the Advanced Power Generation Task Force, was formed in 1999 to provide the focus for the Power Generation Sector in the UK for research, development and demonstration activities on near-

to-zero and zero emission technologies from fossil fuel, biomass, and associated technologies. Recently its main focus has been on carbon abatement technologies including carbon capture and storage (CCS)

The APGTF is an industry-led stakeholder group. A broad range of interests is represented involving power generators, equipment manufacturers and fuel suppliers, and it has strong links with the relevant trade associations and other groupings (including the Association of Electricity Producers, BEAMApower, the Industrial Power Association, the Carbon Capture and Storage Association, Coalimp and COALPRO). There is also representation from the oil and gas sector, the consultancy sector, the research community, Government (DECC, BIS and HSE), and the funding agencies (ETI, TSB and the Research Councils).

The inaugural Chair was Nick Otter OBE of Alstom. When Nick left in late 2008 to take up a post of Chief Executive of the Global Carbon Capture and Storage Institute, he was replaced by Philip Sharman also of Alstom. At present we have eight industrial contributing members who subscribe a small sum for secretarial, consultancy and workshop costs.

The APGTF 'board' meets about four times a year, and aims to hold one-day 'workshops' in London every year. The APGTF has been selected to be the delivery partner for CATs for the Energy Generation &Supply Knowledge Transfer Network (EG&S KTN), and last year we organised a 'KTN day' with the subject 'National Ambitions for Power Generation' the day after our workshop. The APGTF plans to mount a similar two day event on 14/15 March 2011 at 1 Victoria Street London. The first 'APGTF Day' day is expected to focus on CCS; the second 'Cross-sector KTN Day' has the provisional title 'Power Generation in the UK Post 2020'.

Our RD&D strategies have, over the last decade, formed the technical structure for the DTI/BERR/DECC clean coal/CATs strategies and calls, and more recently the TSB's CATs call in 2009. We hope this will continue in the future, with our influence extending to the lower TRLs through the Research Councils, university consortia and the ETI. We have been asked to assist the OCCS in aspects of their proposed roadmapping in the CCS RD&D area. A link with the Coal Research Forum is therefore an obvious and mutually beneficial development.

Further information, details of APGTF workshops, published strategy documents etc. may be found on the website: http://apgtf-uk.com/. Further details of the EG&S KTN may be found on https://ktn.innovateuk.org/web/energyktn; readers are encouraged to visit this site and join the KTN and perhaps one of its groups by following the links.

RCUK Engineering Doctorate (EngD) Centre in Efficient Fossil Energy Technologies (EFET)

The RCUK Engineering Doctorate (EngD) Centre in Efficient Fossil Energy Technologies is an exciting development on the UK energy landscape to meet the recognised skills shortages as we move towards a much lower carbon economy on the trajectory to achieve an 80% reduction in CO_2 emissions by 2050.

This EngD Centre will produce research leaders to tackle the major national and international challenges over the next 15 years in implementing new power plant to generating electricity more efficiently using fossil energy with near zero emissions, involving the successful demonstration of CO_2 capture, and reducing CO_2 emissions generally from coal utilisation, including iron making. These leaders will be part of the new breed of engineers who will be thoroughly versed in cutting edge energy research and capable of operating in multi-disciplinary teams, covering a range of knowledge transfer, deployment and policy roles, and with the skills to analyse the overall economic context of their projects and to be aware of the social and ethical implications.

The challenges of Efficient Fossil Energy Technologies form the basis of individual research projects in the EngD Centre and will ensure that it plays a key role in contributing to the

success of the major developments in clean coal and CO_2 capture technologies. It will make a particular contribution to meeting the demand in the UK over the next decade for Doctorates to meet these challenges.

The existing strong fossil energy research base at Nottingham linked to colleagues at Birmingham and Loughborough in the Midlands Energy Consortium (MEC) and our partners provides an internationally leading platform for the Centre. The Midlands Energy Consortium (MEC) host the UK Energy Technologies Institute, a £1 billion government/industry programme to accelerate the demonstration and deployment of low-carbon technologies.

The EngD Centre has successfully secured £7M of funding from the RCUK (EPSRC) to train 50 engineering doctoral students to be recruited over a period of 5 years. Another 10 studentships should also be available from other financial sources. Altogether, we aim to recruit around 60 students over 5 years. With additional contributions from industry the total funding value is about £9M.

Current research projects
The EngD Centre has 21 Research Engineers conducting projects in the area of Efficient Fossil Energy Technologies, involving 9 industrial partners, and over 20 leading academics across the three Universities.

2009 Research Projects

Industrial Collaborator	Project Title
RWE nPower	Modelling CO_2 transport and the effect of impurities
	Char characterisation in oxyfuel combustion
Doosan Power Systems	Technical and economic optimisation for post combustion carbon capture
	Effects of microstructure on steam oxidation of austenitic stainless steels
	SO_3 behaviour and absorption in CO_2 rich atmospheres
Alstom Power	Low pressure steam turbines operate in a wet steam environment
	Steam oxidation behaviour of nickel base materials at high temperatures and pressures
	Two phase mass flow and quality measurement technique for nuclear and fossil power stations
	An investigation into power plant steels
E.ON	Biomass fuel storage and handling in coal co-firing plants

2010 Research Projects

Industrial Collaborator	Project title
Doosan Power Systems	Ignition testing & flame stability prediction
	Optimised fuel stream for improved burner performance
	Prediction of biomass combustion
Alstom Power	Modelling of rotor steel for steam turbine applications
	Relationships between ultrasonic signal and microstructural parameters in heavy rotor forgings
Air Products	Post combustion capture of CO_2 using adsorbents in a PSA/TSA-type cycle
CPL	Proposal for the development of manufactured solid fuels with reduced emissions of CO_2
BF2RA	Impact of biomass torrefaction on combustion behaviour in co-firing
Tata Steel	The application of carbon capture and storage technology to the steel industry
Scottish and Southern Energy	An investigation into biomass combustion
Johnson Matthey	Selective catalytic reduction of NO_x for coal fired power station exhausts

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Articles from the Technical Press

Rising from the dust

Stephen Neale, for Sunday Telegraph, Lyonsdown Media Group independent supplement – Publication date not given but in mid-2010

By the end of the 20th century the UK mining industry had seemed to have faded to a distant memory. However, a startling turnaround in fortunes could see old mines providing fuel for a new generation of carbon capture power stations.
http://www.lyonsdown.co.uk/publications/2010/mining2010.pdf

The Hungry Dragon

Stephen Neale, for Sunday Telegraph, Lyonsdown Media Group independent supplement –Publication date not given but in mid-2010

In 2010 China became the second largest economy in the world and, together with other emerging economies, continues to grow fast. Can the global mining sector quench this dragon's thirst?
http://www.lyonsdown.co.uk/publications/2010/mining2010.pdf

Obama could kill fossil fuels overnight with a nuclear dash for thorium

29th August, Ambrose Evans-Pritchard, Daily Telegraph

If Barack Obama were to marshal America's vast scientific and strategic resources behind a new Manhattan Project, he might reasonably hope to reinvent the global energy landscape and sketch an end to our dependence on fossil fuels within three to five years.
http://www.telegraph.co.uk/finance/comment/7970619/Obama-could-kill-fossil-fuels-overnight-with-a-nuclear-dash-for-thorium.html

100 jobs will go Npower admits

1st September, Swindon Advertiser

RWE Npower has confirmed 100 jobs will be lost and another 100 transferred as part of a restructuring of its business.
http://www.swindonadvertiser.co.uk/news/8364072.100_jobs_will_go_npower_admits/

Openness urged on UK's emissions

3rd September, Roger Harrabin, BBC

The UK government's chief environment scientist has called for more openness in admitting Britain's apparent cuts in greenhouse gases are an illusion.
http://www.bbc.co.uk/news/science-environment-11172239

RWE, BASF and Linde develop capture of CO_2 in coal fired power plants

4th September, domain-b

RWE Power, Germany's biggest electricity producer yesterday said that it has made a breakthrough in separating carbon dioxide (CO_2), from flue gas in coal fired power plants that will reduce carbon emission, which is key to climate-compatible coal-based power generation.
http://www.domain-b.com/companies/companies_b/basf/20100904_power_plants.html

Low-carbon market to treble by 2020

6th September, Fox Business

The world's low-carbon energy market is likely to treble by 2020, HSBC analysts forecast, saying that rising concerns about resource scarcity would support broad consensus on the threat of climate change.
http://www.foxbusiness.com/markets/2010/09/06/low-carbon-market-treble-hsbc/

Scottish Power sponsors UK's first academic alliance to focus on CCS

9th September, Scottish Power

ScottishPower has announced its sponsorship of the UK's first alliance between industry and academia to focus specifically on carbon capture and storage.
http://www.scottishpower.com/PressReleases_2073.htm

How Much Global Warming Is Guaranteed Even If We Stopped Building Coal-Fired Power Plants Today?

9th September, David Biello, Scientific American

All the world's power plants, vehicles and factories that presently exist may not emit enough carbon dioxide to cause catastrophic climate change. Humanity has yet to reach the point of no return when it comes to catastrophic climate change, according to new calculations. If we content ourselves with the existing fossil-fuel infrastructure we can hold greenhouse gas concentrations below 450 parts per million in the atmosphere and limit warming to below 2 degrees Celsius above preindustrial levels—both common benchmarks for international efforts to avoid the worst impacts of ongoing climate change—according to a new analysis in the September 10 issue of Science. The bad news is we are adding more fossil-fuel infrastructure—oil-burning cars, coal-fired power plants, industrial factories consuming natural gas—every day.
http://www.scientificamerican.com/article.cfm?id=guaranteed-global-warming-with-existing-fossil-fuel-infrastructure

UK climate adviser urges Government not to raise renewable energy target

10th September, Alex Morales, Bloomberg

The UK shouldn't raise its target for generating 15% of its energy for heating, power and transportation from renewable sources by 2020 because it would be too costly, the government's climate change adviser said.
http://www.bloomberg.com/news/2010-09-09/u-k-climate-adviser-urges-government-not-to-raise-renewable-energy-target.html

Britain must adapt to 'inevitable' climate change, warns minister

12th September, Matt Chorley and Jonathan Owen, The Independent

Britons must radically change the way they live and work to adapt to being "stuck with unavoidable climate change" the Government will caution this week, as it unveils a dramatic vision of how society will be altered by floods, droughts and rising temperatures.
http://www.independent.co.uk/environment/green-living/britain-must-adapt-to-inevitable-climate-change-warns-minister-2077175.html

£6.5m energy research centre for Nottingham University

13th September, BBC

The building at the University of Nottingham's Jubilee Campus will include an energy testing facility and a rooftop laboratory.

http://www.bbc.co.uk/news/uk-england-nottinghamshire-11286753

Government recognises role of 'key' renewables technologies

13th September, New Energy Focus

The government has identified offshore wind and marine technologies as "fundamental" to the development of a low carbon economy, in a report response.
http://newenergyfocus.com/do/ecco/view_item?listid=1&listcatid=32&listitemid=4358&section=wind

Coal to remain world's top power source over next 20 years

13th September, Mining Weekly, Matthew Hill

Global energy demand will rise as much as 40% in the next 20 years, IHS Cambridge Energy Research Associates chairperson **Daniel Yergin** said on Monday. "In our scenarios for the future we expect by 2030 to see growth somewhere between 30% and 40% off a much larger base in demand. That's a very large number," he told the World Energy Congress in Montreal.

http://www.miningweekly.com/article/coal-to-remain-worlds-top-power-source-over-next-20-years-2010-09-13

New Hope unveils coal to liquids project

14th September, Sydney Morning Herald

New Hope Corporation Ltd is hoping to eventually produce up to 50,000 barrels of synthetic oil per day, after buying a 25 per cent stake in technology to liquefy coal. New Hope has undertaken a deal with Canadian firm Quantex Research Corporation to commercialise the technology, which Quantex acquired with a licence from West Virginia University in the United States. Under the deal, New Hope will have a 25-year exclusive worldwide licence for the technology, which allows coal to be converted into synthetic crude oil.

http://news.smh.com.au/breaking-news-business/new-hope-unveils-coal-to-liquids-project-20100914-15aa7.html

Scottish Power sponsors UK industry-academia carbon capture and storage effort

15th September, Energy Efficiency News

ScottishPower is investing £5 million in a UK industry-academia alliance focused on carbon capture and storage over the next five years.
http://www.energyefficiencynews.com/power-generation/i/3365/

Big Potential in Indonesia for Unconventional Gas

15th September, The Jakarta Globe

Indonesia, Southeast Asia's biggest oil and gas producer, may become the largest producer of unconventional gas in the region, Wood Mackenzie Research Consultancy said in a report. Indonesia may produce gas lodged in crevices of coal deposits at an initial rate of 22 million cubic feet a day by 2013 and boost it to 900 million in 2020 and 1.3 billion in 2025, said Edinburgh-based Wood Mackenzie.
http://www.thejakartaglobe.com/business/big-potential-in-indonesia-for-unconventional-gas/396310

Commercial-scale test of new technology to recover coal from sludge successful

15th September, Eurekalert

A new technology for removing water from ultrafine coal slurry has been successfully tested at the commercial scale at an operating coal cleaning plant. The technology offers the possibility of reducing the coal slurry impoundment problem from the source. A peer-reviewed paper on this new technology was presented Sept. 15 at the 13th Australian Coal Preparation Society Conference, Cairns, Queensland.

http://www.eurekalert.org/pub_releases/2010-09/vt-ct0091510.php

Spending review may axe CCS subsidies for coal companies

16th September, Peter Jones, The Times.

The Treasury's public spending review has cast doubt on the future of Longannet power station's ambitious carbon capture programme, despite a commitment by ScottishPower to invest £5 million in university research on the project.
http://www.thegwpf.org/energy-news/1550-spending-review-may-axe-ccs-subsidies-for-coal-companies.html

Climate change advisers urge UK to prepare for change

16th September, Richard Black, BBC

The UK needs to prepare itself quickly to deal with the impacts of climate change, government advisers warn.
http://www.bbc.co.uk/news/science-environment-11322929

Synthetic jet fuel opens doors for SA aviation

22nd September, JP du Plessis, Eye Witness News

Sasol on Tuesday said the development of a synthetic jet fuel means the local aviation market will not have to depend on global oil reserves any longer. The company made history on Tuesday by flying the first-ever commercial airliner powered solely by synthetic jet fuel from Johannesburg to Cape Town. The fuel is made from coal rather than crude oil and burns cleaner than current petroleum-based jet fuels.
http://www.eyewitnessnews.co.za/articleprog.aspx?id=49084

World's largest offshore wind farm opens off Kent

23rd September, Louise Gray, Daily Telegraph

Britain is set to generate more energy from offshore wind than the rest of the planet put together, after the opening of the world's biggest ocean wind farm off Kent.
http://www.telegraph.co.uk/earth/earthnews/8018828/Worlds-largest-offshore-wind-farm-opens-off-Kent.html

Future of Renewables Advisory Board in doubt

24th September, New Energy Focus

The future of the Renewables Advisory Board, which advises the energy secretary on renewables policy, is thought to be in doubt after a leaked list of the government's plans for cutting quangos showed it was set to be abolished.
http://newenergyfocus.com/do/ecco/view_item?listid=1&listcatid=32&listitemid=4400&section=Policy

"Unfair" CRC scheme under pressure from all sides

28th September, The Engineer

A report by the Committee on Climate Change has advised the UK government to redesign its 'complex' CRC (Carbon Reduction Commitment) scheme to make it easier for businesses and organisations to cut carbon.
http://www.theengineer.co.uk/channels/process-engineering/unfair-crc-scheme-under-pressure-from-all-sides/1005129.article

CRC scheme deadline looms

29th September, Mark Stevens, Energy Saving Trust

The deadline is looming for the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme.
http://www.energysavingtrust.org.uk/Resources/Energy-saving-news/Moving-home-and-energy-efficiency/CRC-scheme-deadline-looms/(energysavingtrust)/782400

Global climate talks kick off in China

4th October, CNN Wire Staff

Representatives from about 200 countries start meeting on Monday in China to narrow differences on climate change and grapple with extreme weather such as rising temperatures and melting polar icecaps.

http://edition.cnn.com/2010/WORLD/asiapcf/10/04/china.climate.talks/

Wind farms can affect local weather patterns

5th October, Katia Moskvitch, BBC

Wind farms, especially big ones, generate turbulence that can significantly alter air temperatures near the ground, say researchers.

http://www.bbc.co.uk/news/science-environment-11470261

Solar surprise for climate issue

6th October 2010, Richard Black, BBC

The Sun's influence on modern-day global warming may have been overestimated, a study suggests. However, the data is drawn from only 3 years and so should be treated with caution.

http://www.bbc.co.uk/news/science-environment-11480916

Amec wins FEED contract for CCS project in Scotland

8th October 2010

Amec has won a front-end engineering design (FEED) contract from National Grid Carbon for a carbon capture and storage (CCS) project at Longannet Power Station in Fife, Scotland. Amec will carry out the FEED for the transportation element of the CCS project, which is being undertaken by a consortium consisting of Scottish Power, Shell and National Grid Carbon to whom Amec is directly contracted.

http://www.powergenworldwide.com/index/display/articledisplay/8516925896/articles/powergenworldwide/coal-generation/coal-generation-equipment/2010/10/amec-wins_feed_contract.html

UK fuel cell partnership advances clean coal plans

11th October 2010,

UK companies Powerfuel Power Ltd, B9 Coal Ltd and AFC Energy Plc have signed an agreement to install AFC Energy's fuel cell technology at Powerfuel's Hatfield site near Doncaster. The agreement envisages the creation of a joint venture between B9 Coal and Powerfuel to exclusively develop low-carbon fuel cell power stations in the UK.

http://www.theengineer.co.uk/channels/process-engineering/uk-fuel-cell-partnership-advances-clean-coal-plans/1005285.article#ixzz14Jt5EwdS

UK needs to generate more energy from waste: CBI

11th October 2010

Confederation of British Industry (CBI), a UK-based business organization, has said that the British government needs to encourage the use of non-recyclable waste to meet the country's energy needs. Launching a new report 'Going to waste: Making the case for energy from waste', the business group has highlighted that energy from waste can play an important role in a broad-based energy mix, which improves energy security.

http://biofuelsandbiomass.energy-business-review.com/news/uk-needs-to-generate-more-energy-from-waste-cbi_11010

How to keep the lights on
13th October 2010

Critics of renewable energy argue that it is too unreliable, but could grid management technologies be the answer?The plan to establish the UK as the world's largest producer of offshore energy faces one challenge more daunting than any other – what happens when the wind stops?
http://www.guardian.co.uk/globalcleantech100/grid-management

Severn barrage tidal power plan axed
17th October 2010, Matt Chorley, The Independent

Chris Huhne, the Secretary of State for Energy, is to give the go-ahead to a string of new nuclear power stations, wind farms and clean coal plants as he sets out how the coalition plans to keep the lights on in the next three decades.
http://www.independent.co.uk/news/uk/politics/severn-barrage-tidal-power-plan-axed-2109008.html

Green Carbon Center Takes All-Inclusive View of Energy
22nd October, Science Daily

Rice University has created a Green Carbon Center to bring the benefits offered by oil, gas, coal, wind, solar, geothermal, biomass and other energy sources together in a way that will not only help ensure the world's energy future but also provide a means to recycle carbon dioxide into useful products.
http://www.sciencedaily.com/releases/2010/10/101022160302.htm

Scarcity of new energy minerals may trigger trade wars, expert suggests
1st November, Science Daily

It's not hard to argue in favour of alternatives to fossil fuels these days, but one popular argument -- domestic energy security -- may be standing on very shaky legs. A lot of rare metals are needed to make photovoltaic panels, rare earth magnets for wind generators, fuel cells and high-capacity batteries for hybrid and electric vehicles. But most industrialized nations, including the United States, are almost entirely dependent on foreign sources for those metals. The only way this is going to change is if there is more domestic exploration and mining, a leading expert says.
http://www.sciencedaily.com/releases/2010/11/101101083154.htm

EU-funded researchers target innovative methods to cut emissions
15th November, CORDIS News

The Technische Universität Darmstadt in Germany has set up a pilot plant to test two innovative methods for carbon dioxide (CO_2) capture that require less energy and lower operating costs than earlier approaches. The scientists are investigating the so-called 'carbonate looping' and 'chemical looping' methods for CO_2 capture. EU support for the project amounts to EUR 1.1 million under the Research Fund for Coal and Steel.
http://cordis.europa.eu/fetch?CALLER=EN_NEWS&ACTION=D&SESSION=&RCN=32760

UK's RWE Npower to convert Tilbury coal plant to 100% biomass
16th November, Power Gen Worldwide

German utility RWE has submitted a plan to convert its large-scale coal fired power plant at Tilbury, UK to use 100 per cent biomass. Argus Media reports that RWE's UK unit Npower submitted the plans to the Environment Agency to increase the use of biomass at the plant. The 1060 MW power plant is due to be decommissioned by the end of 2015 because of the EU's large combustion plant directive
http://www.powergenworldwide.com/index/display/articledisplay/6267724905/articles/powergenworldwide/renewables/biomass/2010/11/rwe-npower_to_convert.html

Energy U-turn could kill off coal-fired power plant

21st November, Rob Edwards, Herald cotland

A highly controversial plan for a new coal-fired power station at Hunterston in North Ayrshire looks doomed because Scottish ministers have quietly withdrawn their backing for the scheme. A new Scottish Government policy statement on electricity generation does not endorse the £3 billion plant proposed by Clydeport's owners, Peeling Holdings. Instead it makes plain that Scotland's electricity needs can be met without it, due to the large projected growth in wind power and other renewables.

http://www.heraldscotland.com/news/transport-environment/energy-u-turn-could-kill-off-coal-fired-power-plant-1.1069772

Green restrictions on gas 'could endanger UK supply'

21st November, Rowena mason, The Telegraph

Power bosses from RWE and E.ON have warned that the threat of green restrictions on gas could stop new plants being built, potentially endangering Britain's energy supply. Concerns were sparked as ministers announced that they are prepared to fund a £1bn trial project looking at "carbon capture and storage" for gas, where emissions are siphoned off and stored underground. The funding had previously only been available for coal, which is twice as pollutive.

http://www.telegraph.co.uk/finance/newsbysector/energy/oilandgas/8149891/Green-restrictions-on-gas-could-endanger-UK-supply.html

Carbon emissions set to be highest in history

22nd November Steve Connor, The Independent on Sunday

Emissions of man-made carbon dioxide in the atmosphere are roaring ahead again after a smaller-than-expected dip due to the worldwide recession. Scientists are forecasting that CO_2 emissions from burning coal, oil and gas will reach their highest in history this year.

http://www.independent.co.uk/environment/climate-change/carbon-emissions-set-to-be-highest-in-history-2140291.html

Enhancing the efficiency of wind turbines

22nd November, Science Daily

A milestone in the history of renewable energy occurred in the year 2008 when more new wind-turbine power generation capacity was added in the U.S. than new coal-fired power generation. The costs of producing power with wind turbines continues to drop, but many engineers feel that the overall design of turbines is still far from optimal.

http://www.sciencedaily.com/releases/2010/11/101121195434.htm

Novel Metal Catalysts May Be Able to Turn Greenhouse Gases Into Liquid Fuels

4th December, Science Daily

It sounds a bit like spinning straw into gold, but novel metal catalysts may be able to turn greenhouse gases like methane and carbon dioxide into liquid fuels without producing more carbon waste in the process.

http://www.sciencedaily.com/releases/2010/11/101130103615.htm

Carbon dioxide-free energy can meet the world's energy needs in 2050, Danish report finds

6th December, Science Daily

Taken as a whole, energy sources with low or no carbon emissions could easily cover the global energy supply in 2050, according to a new report from Denmark's Risø National Laboratory for Sustainable Energy. The challenge for a sustainable global energy system with low carbon emissions will be to use this potential in the energy system the best way possible seen from an economic point of view.

http://www.sciencedaily.com/releases/2010/11/101116075800.htm

Carbon capture coal firm Powerfuel calls in administrators

9th December, Tim Webb, Guardian

Powerfuel £635m short of money required for CCS scheme and the owner of Hatfield colliery is put up for sale. Administrators have been called in to sell the assets of Powerfuel, which owns Hatfield colliery near Doncaster and planned to build a clean-coal demonstration plant in Britain.
http://www.guardian.co.uk/business/2010/dec/09/powerfuel-clean-coal-ccs-firm-administrators

Speeding up support decision for UK renewable energy

9th December, Renewable Energy Focus

Earlier and greater certainty about the level of support available to large-scale renewable electricity projects will be provided under the UK Renewables Obligation from 2013, according to UK Energy Minister Charles Hendry. Renewable energy developers will get an indication from mid-2011 of the support they will receive for large-scale renewable energy projects staring electricity generation from April 2013.
http://www.renewableenergyfocus.com/view/14539/speeding-up-support-decision-for-uk-renewable-energy/

UN climate change talks in Cancun agree a deal

11th December, BBC News Science & Environment

UN talks in Cancun have reached a deal to curb climate change, including a fund to help developing countries. Nations endorsed compromise texts drawn up by the Mexican hosts, despite objections from Bolivia.
http://www.bbc.co.uk/news/science-environment-11975470

Coal's future is burning hot – just not in Britain

12th December, Rowena Mason and Garry White, The Telegraph

Environmental restrictions are closing down the UK's dirtiest coal plants – more than a third of them will shut by the middle of the decade. But technology for cleaning up coal plants, known as carbon capture and storage (CCS), is struggling to get off the ground.
http://www.telegraph.co.uk/finance/newsbysector/energy/8197613/Coals-future-is-burning-hot-just-not-in-Britain.html

Climate change calculations put millions at risk, says new report

15th December, John Vidal, Guardian

Emissions cuts of 16% by 2030 needed to have at least 70% chance of avoiding climate catastrophe, says Friends of the Earth. Governments are gambling recklessly with human lives by wilfully underestimating the depth of the emission cuts they must makein the next 40 years, a new study has found.
http://www.guardian.co.uk/environment/2010/dec/15/climate-change-gamble-emissions-cuts

Electricity market reforms proposed

16th December, K.W.Wan, K.Schaps and N.Chestney, Reuters

Britain will extend its low-carbon support scheme to nuclear power and clean coal, in a bid to reassure investors about future returns and to help the transformation to a low-carbon economy, it said on Thursday. "We have a once-in-a-generation chance to rebuild our electricity market, rebuild investor confidence, and rebuild our power stations," Energy and Climate Change Secretary Chris Huhne told parliament.
http://uk.reuters.com/article/idUKTRE6BF2I620101216?pageNumber=2

Which Methods of Heating Are Most Efficient?
19th December, Science Daily

Carsten Beier from the Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT in Oberhausen, Germany does not believe that "anyone would burn a 50-dollar bill just to keep warm. It's obvious that it simply is too valuable for that." But, in contrast to dollar bills, most energy carriers are all too frequently burned for less than they are worth.
http://www.sciencedaily.com/releases/2010/12/101213121706.htm

The Research Fund for Coal & Steel (RFCS)

The European Coal and Steel Community (ECSC), which preceded the Research Fund for Coal and Steel (RFCS), was a six-nation international organisation serving to unify Western Europe during the Cold War and create the foundation for the modern-day developments of the European Union. The ECSC was the first organisation to be based on the principles of supranationalism.

The ECSC was first proposed by French foreign minister Robert Schuman on 9 May 1950 as a way to prevent further war between France and Germany. He declared his aim was to 'make war not only unthinkable but materially impossible.' The means to do so, Europe's first supranational community, was formally established by the Treaty of Paris (1951), signed not only by France and West Germany, but also by Italy and the three Benelux states: Belgium, Luxembourg and the Netherlands. Between these states the ECSC would create a common market for coal and steel. The ECSC was governed by a 'High Authority', checked by bodies representing governments, MPs and an independent judiciary.

The ECSC was joined by two other similar communities in 1957, with whom it shared its membership and some institutions. In 1967 all its institutions were merged with that of the European Economic Community (EEC, which later became part of the European Union), but it retained its own independent identity. However in 2002 the Treaty of Paris expired, and with no desire to renew the treaty, all the ECSC activities and resources were absorbed by the European Community. During its existence, the ECSC had succeeded in creating a common market but could not prevent the decline of the coal and steel industries. It did however set the ground for the future European Union and to the formation of the RFCS. The European Commission manages its residual assets and uses the interests generated yearly to finance research projects in the areas of coal and steel.

The RFCS finances research projects in the areas of coal and steel. Its annual budget is about € 60 Million, of which 72.8 % is earmarked for steel-related and 27.2% for coal-related projects.
These projects cover: production processes; application, utilisation and conversion of resources; safety at work; environmental protection and reduction of CO_2 emissions from coal use and steel production.

New RFCS projects starting in 2010

Project Number	Project category	Short title	Title	Duration (months)	Start date	Co-ordinator	Funding (€)
RFCR-CT-2010-00001	TGC 1	GEOSOFT	Geomechanics and control of soft mine floors and sides	36	01.07.2010	Golder Associates (UK) Ltd.	1,961,593.00
RFCR-CT-2010-00002	TGC 1	COGASOUT	Development of novel technologies for predicting and combating gas outbursts and uncontrolled emissions in thick seam coal mining	36	01.07.2010	Imperial College London	2,184,756.00
RFCR-CT-2010-00003	TGC 1	UCG & CO_2 STORAGE	Study of deep underground coal gasification and the permanent storage of CO^2 in the affected areas	30	01.07.2010	Overgas Inc. AD	1,840,783.00
RFCR-CT-2010-00004	TGC 1	LOWCARB	Low carbon mine site energy initiatives	36	01.07.2010	University of Exeter - Cambourne School of Mines	2,326,014.00
RFCR-CT-2010-00005	TGC 1	MINFIREX	Minimising risk for and reducing impact of fire and explosion hazards in underground coal mining	36	01.07.2010	DMT GmbH & Co KG	1,532,538.00
RFCR-CT-2010-00014	TGC 1	MISSTER	Mine shafts: improving security and new tools for the evaluation of risks	36	01.07.2010	Institut National de l'Environnement Industriel et des Risques	1,804,111.00
RFCR-CT-2010-00006	TGC 2	SPRITCO	Generation of swelling pressure in a coke, transmission on oven walls and consequences on wall degradation	42	01.07.2010	Centre de Pyrolyse du Charbon de Marienau	1,165,400.00
RFCR-CT-2010-00007	TGC 2	DENSICHARGE	Improving the use of alternative raw materials in coking blends through charge densification	36	01.07.2010	Corus UK Ltd.	1,723,413.00
RFCR-CT-2010-00008	TGC 2	RATIO-COAL	Improvement of coal carbonization through the optimization of fuel in coking coal blends	36	01.07.2010	University of Katowice	1,089,501.00
RFCR-CT-2010-00009	TGC 2	FECUNDUS	Advanced concepts and process schemes for CO_2 free fluidised and entrained bed co-gasification of coals	36	01.07.2010	IRC-CNR	1,726,218.00
RFCR-CT-2010-00010	TGC 2	ECOWATER	Enhanced treatment of coke oven plant wastewater	42	01.07.2010	Corus UK Ltd.	632,470.00
RFCR-CT-2010-00011	TGC 3	CARINA	Carbon capture by means of indirectly heated carbonate looping process	42	01.07.2010	TU Darmstadt	1,475,050.00
RFCR-CT-2010-00012	TGC 3	DEVCAT	Development of high performance SCR-catalysts related to different fuel types	36	01.07.2010	University of Stuttgart	1,415,913.00
RFCR-CT-2010-00013	TGC 3	CAL-MOD	Modelling and experimental validation of calcium looping CO_2-capture process for near-zero CO_2-emission power plants	36	01.07.2010	University of Stuttgart	1,225,067.00

Student Bursaries for 2011-2012

Up to 6 travel and subsistence bursaries for up to £300 are on offer to bona-fide full-time students wishing to attend appropriate National and International coal-related conferences. To apply, please send the abstract submitted to the conference with a brief supporting letter from your supervisor to:

Prof. J.W. Patrick
School of Chemical & Environmental Engineering
The University of Nottingham
University Park
Nottingham NG7 2RD

The bursaries come with no obligations to the recipient other than to supply a short essay about his or her impressions of the conference to the Newsletter for inclusion in the next edition.

CALENDAR OF COAL RESEARCH MEETINGS AND EVENTS

Date	Title	Location	Contact
1st February 2011	4th Annual Industry and Power Association, (IPA), Scotland Conference, "Policies for Power"	Marriott Hotel, Glasgow, UK,	E-mail : events@ipa-scotland.org.uk Tel : 01355-272631
15th February 2011	Coal UK conference & dinner 2011	London, UK,	Susie Hansford, The McCloskey Group, Unit 6, Rotherbrook Court, Bedford Road, Petersfield GU32 3QG, UK Tel: +44 1730 265095 Fax: +44 1730 260044 Email: susie.hansford@McCloskeycoal.com
17th to 18th February 2011	5th annual conference on European carbon capture and storage	London, , UK,	Stacey Knox, Platts, 20 Canada Square, Canary Wharf, London E14 5LH, UK Tel: +44 20 7176 6226 Fax: +44 20 7176 6890 Email: stacey_knox@platts.com
9th March 2011	Conference on underground coal gasification - the acceptable face of coal mining?	Edinburgh, UK,	David Seath, Institute of Materials, Minerals and Mining, 1 Carlton House Terrace, London SW1Y 5DB, UK Tel: +44 20 7451 7300 Fax: +44 20 7839 1702 Email: d.seath@btinternet.com
13th April 2010	**The CRF Annual Meeting together with a joint Coal Conversion/Coal Characterisation Divisional Meeting.**	**University of Nottingham, School of Chemical and Environmental Engineering**	**Dr.D.J.A.McCaffrey, CRF Secretary.** **E-mail : mail@coalresearchforum.org**

8th to 12th May 2011	CCT2011: 5th international conference on clean coal technologies	Zaragoza, Spain,	Robert Davidson, IEA Clean Coal Centre, Gemini House, 10-18 Putney Hill, London SW15 6AA, UK Tel: +44 20 8780 2111 Fax: +44 20 8780 1746 Email: service@iea-coal.org.uk
9th May 2011	World of coal ash 2011 (WOCA 2011)	Denver, CO, USA,	Annely Noble, ACAA, 15200 E. Girard Ave., Ste. 3050, Aurora, CO 80014-3955, USA Tel: +1 720 870 7897 Fax: +1 720-870 7889 Email: info@acaa-usa.org
Provisionally late 2011 – early 2012	**The European Industrial Emissions Directive (IED)** Coal Research Forum (Environment Division) joint with the Combustion Engineering Association and the Royal Society of Chemistry Energy Sector and Environmental Chemistry Group	**London, venue to be announced**	**Dr Trevor Drage** **E-mail: trevor.drage@nottingham.ac.uk** **Tel: 0115 951 4099**