

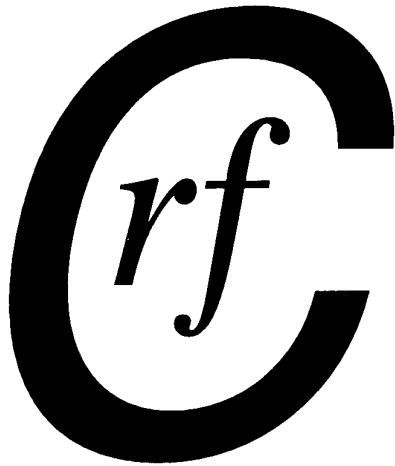
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NEWSLETTER

of the

Coal Research Forum



**Editor Alan Thompson wishes
all our readers a**

A Happy New Year

EDITOR'S COMMENTS:

As 2004 comes to an end, (and didn't it go quickly!) the coal community are hearing things which they already suspected but are now being confirmed. Many people realised that the UK was not expected to achieve its 2010 target of 20% CO₂ emissions reduction and now the Government has admitted that this is probably so. The USA not only sees the Kyoto Agreement as 'a political agreement...not based on science' but it has been revealed that the monies allocated to high profile projects such as FutureGen are being cut back and coal power is set to increase in the USA. So, how do we, with vested interests, view all of this? Does our conscience prick us that we are not effectively addressing climate change; do we secretly welcome the continuing use of coal with all of its associated baggage or do we accept the inevitable and learn to cope global warming. Answers, please on a post card to!!

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5th European Conference on Coal Research & Its Applications

held at the University of Edinburgh, 6th to 8th September 2004

One of the highlights of the Coal Research Forum calendar, the biennial conference, came around for the newsletter editor with what seemed remarkable speed once again! Why, you ask, should this affect the newsletter editor? Well the newsletter editor has another hat - that of conference secretary (and a few more grey hairs)!!

The Organising Committee had felt that in the light of the success of the 2002 conference held at Imperial College, London a re-titling of what had been a "UK Meeting" to a "European Conference" would be more appropriate. This proved to be a sound move as attendees from Germany, the Netherlands, Spain, Greece, Portugal, Czech Republic, Serbia and Sweden attended the conference. Long distance travellers from places much further afield such as South Africa, Russia, Colombia, Korea, China, Indonesia, Japan and Australia were also in attendance.

The number of attendees at the conference was 117, which is the highest total thus far, and the number of papers presented (60) and posters (~35) were also record figures. However, record-breaking is not the name of the game, satisfying though it is for the organisers efforts to be well-supported. The organising committee has always tried to include as full a programme of presentations as is possible within the three day, 'non-parallel session' event. In this case, I fear, we may have gone a little too far and comments (see later) have been duly noted.

I will not do more than describe the format of the conference - a flavour of how it appeared to several IChemE CUSG travel-sponsored students may be more informative.

The conference opened on Monday 6th September and the delegates were welcomed by the Conference Chairman, Professor John Patrick. The Conference Keynote speaker Dr Allan Jones of E.ON UK plc, then opened the proceedings with a presentation entitled, "Fuelling coal-fired power stations in the UK - Quality issues arising from the need for fuel flexibility". This was followed by two sessions before lunch, entitled 'Pulverised Coal Combustion' and 'Combustion - CO₂ Issues'. After lunch a further two sessions took place entitled 'Co-combustion' and 'Image Analysis and Modelling'. A buffet was served in the evening during which the poster presentation session.

On Tuesday morning, the session on 'Cleaner Coal Technologies' was launched by a Keynote Address from Dr Andrew Minchener" entitled 'Coal Gasification for Advanced Power Generation'. The afternoon saw sessions on 'Beneficiation and Handling' and 'Deposition and Mineral Matter'. This punishing schedule was only broken when during Tuesday evening the inmates were allowed brief respite to attend the Conference Dinner. This was held in the very salubrious surroundings of the Carlton Hotel in central Edinburgh and was enjoyed by everyone, of that I have no doubt! Pleasure over it was back in harness for the final canter to the end of the conference. No easy days at this conference with an early, last-day finish!!

Three sessions were scheduled for Wednesday 8th with closure at 4.30pm; 'Coal Conversion' followed by 'Trace elements' with the Keynote Address entitled, 'Trace element emissions during co-combustion' from Dr Ruud Meij of KEMA. The

last session was entitled 'Gaseous Emissions and Other Coal-related Topics' and was introduced by Keynote Speaker Dr Lesley Sloss of the IEA Clean Coal Centre. Her talk was entitled 'Trends in Emissions from Coal Combustion'.

The closing remarks were given by the Conference Chairman Professor Patrick who thanked all speakers and attendees and wished them a safe journey home with the hope of seeing some of them at least again in 2006.

The Institution of Chemical Engineering – Coal Utilisation Subject Group provided travel support to 10 UK-based students to attend the conference. Some of these views provide a picture of how they saw their 3 days in Edinburgh early last September.

A postgraduate account of the Edinburgh Conference by Edwige Sima-Ella, University of Bath

The 5th *European Conference on Coal Research and its Applications*, which took place in Edinburgh early last September was an enlightening experience. The combination of academic research projects with industrial applications was of great benefit for new coal researchers. It was particularly interesting to grab this widespread of applications and useful researches carried not only in Europe, but also in Australia, and Asia; especially, China and Japan. As a novice in the world of coal, this conference really drew out the extent of the subject. From coal handling, characterisation, conversion to cleaner coal technologies, there was always something new to learn. How impressive is the "ash re-firing" growing, and alternatives fuel sought from coal like hydrogen production! As an environmental chemical engineer, I was extremely satisfied with the gaseous emissions session. I enjoyed the phrase: "coal did some damage in the past, but it hasn't done that bad... so don't panic!". This was very encouraging, because processes are being modified, and new technologies implemented in order to meet legislation. I was very pleased with the conference as a whole, seeing so many participants enthusiastic about the subject, when "coal is as old as the earth". I left this conference with the feeling that coal is not just something from the past, but the future too! There is still a large amount of research to be carried, and so many potentialities to address.

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Comments on the 5th Edinburgh Conference by Gang Yuan, University of Bath

Coal Research and its Applications was a very interesting and useful event. Particularly interesting to me were the series of lectures on image analysis and modelling where work using digital processing techniques to quickly characterise raw coals was presented, as well as a number of papers on the modelling of the behaviour of coal in both the bunker and the boiler. I was able to meet many people involved with coal from around the world and the conference dinner proved an especially useful occasion for meeting and discussing our work with people from a diverse coal background. I was co-author to a poster presented at the conference so it was very useful to be showing people the work we have been involved with at the University of Bath, and to hear their points of view. Having now attended the 5th European Conference on Coal Research and its Applications, I have come away with a better understanding of the workings of an international conference. The CRF's purpose of this series of meetings is to bring together people in universities and industry who have genuine interests in the products of modern coal research, and it is because of this that I feel I have really benefited.

A Post graduate Account of the Edinburgh CRF Conference by Ben Lindsey, University of Bath

For a relative newcomer to the subject of coal research, the 5th European Conference on Coal research & Its Applications, held in Edinburgh, proved to be an excellent means of meeting people in two capacities. Firstly, people with similar research interests to mine either at an equal stage or with considerably more experience. From these people one can find answers to problems and maybe even offer advice in return. The second group are those whose immediate interests have no direct relation to mine, but can still offer two things: an impartial, fresh viewpoint which I may not have considered, and an opportunity to expand my knowledge of how research of coal is progressing as a whole. This is useful for future employment prospects, something easily forgotten in the midst of a PhD! I found the presentations extremely interesting. My particular line of work, co-combustion, was well attended, with good opportunities to speak with people whose literature I have been reading for the last few years. In all the programme of events, the people and the setting of this conference have made attending it very worthwhile.

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Comments on the Edinburgh Conference by Mohammed Zandi, University of Sheffield

The 5th European Conference on Coal and its Applications was held in Edinburgh, capital of Scotland, one of the UK's most visually stunning cities. The University of Edinburgh supplied first class facilities for attendees and the conference.

The conference was opened by Professor John Patrick who has accumulated a lifetime of the science and technology of coal combustion in all different aspects following by interesting speech by Dr. Allan Jones from E.ON-UK plc. Through out his presentation, evidences and examples has been provided of the very real contribution that R&D in the UK has made to understanding and optimising the coal conversion process in a power plant boiler against changes in operating conditions. Also a brief consideration of the future low carbon world and the threat that this imposes on coal fired electricity generation was given.

Four sessions were included in the first day of the conference. Each dedicated to one of the coal combustion aspects. A brief consideration of the current situation of coal fired plants in Russia was presented in the first session giving an overview of the coal combustion technologies currently available in Russia and the future for coal there. The first session ended with a report on impact of ash re-firing on power station performance. The second and third sessions addressed present studies on co-combustion and CO₂ issues derived from coal combustion. The last session considered the latest results of coal combustion modelling conducted by different research institutes and universities. The first day of the conference finished with a poster session which gave an excellent opportunity for researchers to illustrate their activities. It also allowed for discussion to share knowledge with industry representatives and other attendees. The poster session gave a chance to put in debate problems that industries or other researchers are struggling with at the present time. Over 40 posters were presented in a nice friendly environment.

The second day of the conference was scheduled over four sessions presenting current activities on clean coal technologies, beneficiation and coal handling and minerals and deposition matter in coal fired power stations. Over 20 papers were presented from different countries giving an overview of present activities in above areas. Sasol's representative gave a brief view of the company position

and activities. In another interesting study from Serbia and Montenegro, the current position of coal consumption was described. Also efforts to tackle heating problems were addressed. Fine coal pelletising was experienced as a solution for heating of schools, hospitals etc. The effects of mineral addition on coal ash deposition and related activities at Imperial College London were described in another presentation. Also present activities of Corus UK on coal characterisation were discussed by its representative.

Coal conversion, trace elements release from coal combustion by-products and other coal-related activities were included in the last day of the conference. 18 papers were presented in three sessions. An interesting presentation was given by Dr.R. Meij from Netherlands describing trace elements classifications due to their volatility and analysing trace elements emissions from a Dutch coal-fired power station. An excellent talk was given by Professor J. Williamson, Imperial College London, on coal mineral transformations in coal fired power station and its effects on deposition patterns which was forwarded from second day of the conference. Also Dr. L. Sloss summarised recent efforts in reducing and controlling emissions from coal combustion in developed countries. It was suggested although much of the atmospheric pollution in the developed world may decline in the future it is important to remember that areas such as Asia will continue to grow in terms of both population and fuel use. On the other hand, future reductions in pollution in developed countries may well be effected by vast increase in pollution from other areas.

The conference provided a great opportunity for both industries and academics to gather under one roof and share recent activities. Also it gave a chance for young researches to meet pioneers in coal research and gain insight from their experiences. The Coal Research Forum was successful in meeting one of its major objectives making a bridge between universities and industries.

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CRF Conference - Contribution by Karl Smith, University of Nottingham

Scrambled eggs, baked beans, sausage, black pudding, bacon. These foodstuffs constitute what for many was to be their last meal prior to the 2004 Coal Research Conference; these items of food were what were on offer at the dining hall at the halls of residence in which many of the delegates had been housed.

9:25am, Monday morning may sound a fairly innocuous start to a conference. What many of the attendees had not reckoned with however was the proposition of having to sit through an unending stream of lectures all the way to 1pm. Furthermore, with the absence of a microphone made extremely conspicuous by the low voices of many of the speakers, and with some lecturers far exceeding their permitted time limits, the conference start was not perhaps as auspicious as might have been hoped for. Moreover, many of the slides seemed to have been extracted straight from the world championship for reading very small letters from long distances. (Get off the fence, Karl, what did you really think about it! Ed.)

However, after lunch and much needed coffee, things seemed to pickup, with the eventual arrival of the poster session and buffet proving to be the highlight of a long and wearisome day. Amazingly, not a single person failed to turn up to give their lecture. This exemplary rate of attendance was not replicated in the poster session, but still most of the registered posters managed to reach their allotted board space. Overlapping the poster session with the evening buffet did however

have the effect of leading many of the delegates to focus more on their stomachs, or rather the filling of them, then on the assembled posters, but with such fine food and wine at their disposal, this was not perhaps such a bad thing.

On the second day the delegates rose to bright sunshine, but in the case of some a slight hangover – a remnant of the festivities at the Royal Oak the night before. For those diligent and eager enough, there was a full lecture program, which spanned from 8:20am to nearly 6pm, to look forward to.

The sunshine persisted for the rest of day. Consequently, lunch was spent by many on the patio of the conference centre, with Arthur's Seat providing a bewitching backdrop to the delegates' chewing and chatter. The stunning weather meant however that sitting through 11 lectures post lunch was a prospect that perhaps wasn't quite as appealing as it might ordinarily have been.

The conference dinner, which was held on the Tuesday night in the Carlton Hotel featured some excellently prepared food, splendid company and a not insignificant amount of wine, all of which needless to say was enjoyed most uproariously by the delegates. Proceedings kicked off with pre-dinner drinks in a room from which a first rate view of Edinburgh Castle could be had. Being that this all took place in the evening, delegates were able to bask in the pleasure of watching Edinburgh being slowly enwrapped by darkness as the dwindling rays of the Sun gave way to night's sinuous embrace.

As the desert dishes were emptied and the glasses of wine morphed into cups of coffee, John Patrick gave a short address with his customary eloquence and finesse to thank all of those who had worked so assiduously to organise the conference, not least himself. This was greeted with heartfelt applause and not a little imbibing of the last gasps of alcohol.

The final day of the conference proved to be a rather solemn affair with many of the delegates clearly troubled about having to leave their salubrious surroundings and return to the monotony of their day-to-day existence spent eking out a living at the coalface of life. For myself, the overwhelming sensation was one of sorrow; sorrow at leaving the conference, sorrow at leaving Edinburgh and sorrow at the prospect of spending over 5 hours on a train on my return journey. Och aye tha' noo indeed!

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My experience at the 5th CRF Conference in Edinburgh by Andy Patsias, University of Leeds

The 5th Coal Conference in Edinburgh was my first conference. The first impression I got was of the excellent facilities presented to us, with clean and spacious provided accommodation situated next to the conference buildings. My fellow delegates were very colourful to say the least, whose backgrounds were from an academic and industrial standpoint, thus giving the conference an air of relaxation and diversity. This rich diversity, combined with the fact that a sizeable proportion were from mainland Europe, Australia, China and Japan, meant that the 15 minute presentations were indeed very colourful and light humoured. The keynote speakers were very eloquent and definitely helped to get each session started with a full house and a very good insight into subjects that I would not necessarily be interested in. Questioning was friendly and very informative and the time period of five minutes was just right. The atmosphere, being the way it was, meant that when it was my turn, (on the Wednesday second to last), I was confident enough to present my work, albeit with a few

stutters, with the knowledge that people wouldn't "jump down my throat" if the need arose, which fortunately it didn't! The only downside to the conference was the sheer number of presentations held in one session. It was impossible to concentrate on all presentations in any particular session, with as many as 9 presentations in one sitting, the feeling of "brain melt" was apparent to a lot of people. As a result, a lot of very good speakers/presentations did not get "full justice". Perhaps for future conferences of this kind, some sessions could have run parallel to ease the time constraints being imposed.

As a first conference, I would like to heartily recommend that other PhD research candidates, whose experience of going to these events and presenting their work is "nil", to go to the 6th Coal Conference next year!

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Comments on the 5th European Conference by Zelia Aquino, University of Nottingham

The "5th European Conference on Coal Research & Its Applications" was held last September 6th to 8th in Edinburgh, a perfect place for such an event. So much so that many attendants took the opportunity to bring their family along to enjoy the beautiful city. Greater yet, the weather played an essential role, with sunny days and blue skies on everyday of the event. Attendants and their families also had a chance to have a taste of the "Edinburgh Festival", which ended on Sunday night with a fantastic firework display.

As the conference is becoming more and more popular delegates this year came from a wide range of countries. Distant countries such as South Africa, China and Australia were represented strongly confirming their ongoing contribution to coal research, through talks, poster presentations and very active networking.

The conference was organised in 10 sessions spread during the three days, with one poster session on the first day. However, luckily this is not a large conference and I did not have to dwell on deciding which sessions to attend. All sessions took place in the same hall so I did not miss any topic of my interest. Of course, given the subject of my PhD research, one of the highlights of the conference for me was the session called "Image Analysis & Modelling", which forms a relevant part of my studies. Another point of interest for me took place on the last day of the event, when I could enjoy the high quality keynote presentation "Trends in emissions from coal combustion", given by Dr. Lesley Sloss from IEA Clean Coal Centre, which provided us with an overall view of this relevant subject.

On a more personal note, the main reason for my attendance was to present a poster entitled "Variability of char characteristics obtained from different fly-ash beneficiation processes". Standing by my poster and answering questions of researchers working in similar fields undoubtedly contributed to expose my research findings to the wider research community, with consequent relevant feedback and discussions.

All in all, I strongly believe that attendees had a great opportunity to acquaint themselves with other researchers in related research fields and, moreover, attain an improved understanding of the latest developments in coal research. Last but not least I could not forget to mention the superb conference dinner, held on Tuesday evening at Hilton hotel. Delicious food and very posh place!

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Comments on 5th European Conference by May Gong, University of Nottingham

Beautiful scene, historic city and wonderful fireworks were the initial impressions of Edinburgh before the 5th European Conference on Coal Research & its Applications. I did believe it's a delightful start of the conference.

I would like to say there is a tiny oversight of the preparation of the Edinburgh. No fingerposts of the assembly room were shown on the way to conference. I had to follow the others to find the place. However, some of the presentations were quite impressive. The conference showed the latest development of coal technologies. Sometimes I couldn't catch the speaker's words of due to the low voice of lecturer (lack of microphone) and/or the accent of speaker.

The agenda of the conference was very compact. I reckoned that the duration of presentation should be controlled effectively; and the chairman should remind the lecturer to abide the regulation.

Co-combustion of coal and biomass became more popular in this conference, which showed the situation of ash development. Actually, I felt a bit lonely since no one else did work with electrostatic precipitation of fly-ash which was my major.

I enjoyed the conference dinner in the Carlton Hotel, not only for the delicious food and desert, but also for the pre-dinner drinks where I could view the beauty of Edinburgh. The impassioned applause at the end of dinner was the sincere thanks of every delegate.

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Comments on the 5th European Conference by Wu Tao, University of Nottingham

I've attended two such conferences during my PhD study at Nottingham University. Such a conference has been very successful in bringing coal research people from UK and some other EU countries as well as some Asian-pacific countries. As I've noticed, the meeting held two years ago, there were representatives from about 17 countries, but the one we had in Edinburgh, attendees were from around 20 nations, which suggests that the conference is gradually gaining international influence.

Generally speaking, participants are either from universities/research institutes or from industries. Therefore, the conference makes me get some ideas on the hot research areas of coal utilisation related to power generation either from engineering point of view or academic point of view. It serves well to link industries and academics and will definitely improve the efficient and clean use of coal in power generation industry.

At the Edinburgh meeting, there were not many speakers talking about coal/bio-mass gasification and IGCC. There should have been more presentations on this gasification area, along with some other coal research areas such as the synthesis of petrol from coal, as these are very hot research areas. It would make the conference much more influential if it could have more sessions/speakers to cover coal/bio-mass gasification, fuel cell and some research area of clean coal technology. I had chats with other attendees to the meeting, some of them share the same opinions with me. They even said they initially prepared some talks on

gasification but changed it to combustion when they felt the meeting was more like a meeting just on coal combustion.

Regarding meeting organising, Alan and David have done a great job on it (Thank you!! - Ed). However, (Oh, dear - Ed!) if we have more people get involved in the organising, it will further improve some aspects of the meeting, such as the collection of abstracts could look much better if all abstracts were in similar format with conference logo on them, more advertisements could possibly get more people to join us in the meeting, a better place for poster session (like the one we had in London) could help to make the meeting more impressive.

Frankly speaking, I did have a very good time there. Pretty much enjoyed quite a few presentations, which I believe might evoke in me some thoughts of my future research on coal combustion and gasification. I also made some friends in the meeting and exchanged some ideas on certain aspect of coal utilisation.

Really, I enjoyed my time in Edinburgh, a nice conference at a nice city with a group of nice people working on a still promising subject.

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**Joint Advanced Power Generation Division / Coal
Combustion Divisional Meeting entitled
"A Low Carbon Future – Opportunities for Coal"
held at Ferrybridge Power Station, courtesy of Scottish & Southern
Energy, 3rd November 2004.**

For the second meeting running yours truly failed to make the starting line in sufficient time but this time circumstances conspired against me! Three hours should have been enough to make the relatively short journey from Nottingham to Ferrybridge but no! A juggernaut lying on its side on the A1 meant that I arrived about 15 minutes late. Fortunately, as this was a joint meeting between the Combustion and Advance Power generation divisions Peter Sage, who had had farther to travel than me, was able to make the introductions.

The welcome and opening remarks were made by Michael Gee, on behalf of SSE and Peter Sage for the CRF. The first presentation was a joint one by Michael Gee and Mark Roberts who gave an introduction to Ferrybridge power station and its operations.

Michael Gee gave the first half of the SSE presentation and described Ferrybridge Power Station. It has 4 Babcock & Wilcox front wall-fired boilers, single furnace natural circulation boilers. Each boiler is supplied with PF by 8 10E mills and each has 48 Mk3 axial swirl Mitsui Babcock low NOx burners. Unit 4 was closed in 1997. The remaining units are authorised to burn up to 12.5% authorised solid waste and also tall oil, (a waste from the paper industry). Electrical power is produced by 4 x 500 MW Parsons single shaft generators and steam conditions in the HP turbine are 565°C and 165bar. Although high levels of investment have been made to the plant in recent years and although it has provided reliable, safe and robust performance, the future of Ferrybridge power station is uncertain due to environmental regulations.

Mark Roberts then described the co-firing regime that is in operation at Ferrybridge and discussed the range of biomass materials currently in use.

Peter Sage then made two presentations, the first of which was entitled "An update on the UK DTI Carbon Abatement Technologies (CAT) Strategy". Peter began by reviewing the DTI consultation document published in August 2004. It had a risen following the release of a series of other documents such as the Energy White Paper and CCS Review which appeared in 2003 and the EOR Implementation Plan and the CFF Fourth Call which appeared in the first half of 2004. The emphasis was changed from cleaner fossil fuel towards CO₂ capture and the consultation process was to be followed by the issue of the strategy document towards the end of 2004.

A Stakeholder Workshop had been held in Birmingham on 26th October 2004. It was a well-supported event with around 70 attendees and comprised interactive sessions and syndicate session. The latter focussed on plant manufacture and operation and carbon dioxide utilisation and storage. From a preliminary analysis of responses Peter was able to summarise some of the views expressed. These were that a twin trajectory approach, (i.e. zero emissions and increased efficiency), was favoured and although most favoured a UK demonstration plant there was a lack of unanimity on the objectives and scope of the project. Some concerns were expressed over the adequacy of the draft objectives citing a lack of clarity which was felt might result in inaction. There was also felt to be no link between the short-term efficiency requirements and the longer term needs for CCS. Maximisation of global environmental benefits and the need for more international funding were agreed as being important goals. It was intended that stakeholders should be more widely represented in the consultation and included equipment suppliers, plant operators, process engineers, geologists/up stream gas and oil, the R&D community, regulators and authorisers and NGO's. Their views were also that they supported the twin trajectory approach and favoured a demonstration which had R&D support. They felt that the strategy lacked urgency, particularly in the case of EOR; they favoured links with Hypogen for hydrogen production and felt the involvement of all stakeholders was important. It was felt that all funding bodies should be involved and that public opinion was very important. The issue of the strategy document was said to be on schedule.

The second presentation concerned the FENCO Initiative. FENCO stands for Fossil Energy Coalition and is an ERA-Net or European Research Area. The ERA-NET scheme is about the co-ordination and co-operation of national and regional programmes and as such, it is aimed at the national and regional programme makers and managers. These are, in most countries, either working in the Ministries or working in national funding agencies, which implement programmes on behalf of their governments.

The FENCO objectives were to set up an ERA-NET for the development of a technology path that gives the opportunity to share knowledge and funding options for a step-by-step improvement of fossil energy technologies. This ERA-NET would link the R&D and demonstration needs of EU member states, the EU industry and academe on an extended European level to describe a technology path towards low and near zero emission power plants. It would also establish a Europe-wide, critical mass initiative that will enable the EU fossil fuel technology industry to be competitive in the world market

The drivers for the FENCO initiative are that global energy projections mean that fossil fuels will be required for several decades; renewable energy will only become significant in the energy mix in time – a portfolio approach needed and

that developing countries (e.g. China) have to be engaged if global climate change is really tackled. The acceptability of nuclear power is another driver as is global climate change (up to and post 2050 targets will need full range of solutions); security of energy supply implications and economics.

US industry is set to take the lead on low-to-zero emission technologies and its CFF technologies are firmly established as key components of its carbon reduction strategy. An 18% reduction in carbon intensity by 2012 is planned, backed by RTD and D initiatives. The Clean Coal Plant Improvement programme has a budget of US \$2 billion over the next decade. CO₂ capture and storage projects requested a budget for 2004 of US \$60 million from a `zero` position less than 5 years ago. The US has established regional networks and their Futuregen Project, launched with a US \$1 billion budget, (80% from USDOE) involves electricity and hydrogen plant with CO₂ sequestration. In the light of US plans it was seen as vital that Europe responded in an effective way. A critical mass initiative to ensure that Europe could compete on world markets was needed involving a sector-wide initiative which would bring together industry, academe and governments. It required a combination of national Member State and EC RTDD programmes with industry and research community and a thrust towards carbon management strategy for power generation with fossil fuels. One of the options that was considered and subsequently chosen was an instrument that is part of the EC FP6 initiative, that is the ERA-NET scheme. By this means it was possible to take a two stage approach using a Specific Supported Action (SSA) followed by a Co-ordination Action (CA). This was to be initiated by (quasi) government organisations of Member States and linked to industry and national aims and objectives e.g. POWER21, Thematic Networks, etc.

Progress to date on the FENCO initiative has been to hold a workshop on 18-19 December 2003 at Lisbon, which was hosted by GRICES (Portuguese Cabinet of International Relations of Science and Superior Education). In addition, the integration of first new partners and the presentation of some first Member States Programmes was made. A presentation as POWER 21 took place and a preliminary questionnaire on national fossil fuel R&D programmes was prepared.

A number of visits to countries to engage new partners was undertaken as was the 2nd Workshop in London 25-26 March 2004. In this there were 12 countries and 4 stakeholder groups participated. Presentations at DG RTD and POWERCLEAN were made and were well received. The requirements for a programme database have been discussed and priorities for fossil fuels ERA-NET were debated with the importance of strategic issues and development of joint programmes being recognised.

Further country visits to Denmark, Spain and Greece were made and a 3rd Workshop, in Berlin 28-29 June 2004 was held. 12 countries participated, from which it was implied that their intent was to join the FENCO CA. Individual country interest, experience and aspirations were assessed and agreement on the FENCO CA was obtained. An outline and scope has been agreed and actions remain for proposal preparation.

The Working groups convened in July-August 2004 to progress the proposal with meetings at Jülich, London and Lisbon. A 4th Workshop was held in Brussels 20-21 September 2004 to finalise technical and financial detail of FENCO CA proposal. A small group finalised the proposal in Berlin at the end of September 2004. The FENCO CA proposal was submitted October 2004 and the EC's response is awaited.....!!!

This was followed by a talk given by Alan Thompson entitled "Current R&D for CO₂ Capture". The presentation focussed only on capture technologies. Advantages and disadvantages of post combustion methods such as chemical and physical solvent scrubbing, adsorption, membrane and cryogenic separation were briefly reviewed. Some of the newer technologies such as mineral carbonation, chemical looping combustion, solid oxide fuel cells, biofixation and regenerable solid absorbents were also highlighted. The benefits and drawbacks of pre-combustion decarbonisation and oxyfuel firing were also discussed. The overall R&D needs for each of the technologies of CO₂ capture were then presented. The main requirements were for lower costs of capture, higher collection efficiency and overcoming known, specific problem areas such as, for example, corrosion when using solvent extraction.

The talk then moved on to specific R&D being carried out at the University of Nottingham. Work involving the separation of carbon from fly ash followed by conditioning and treatment with amines has shown promise. Methodologies for the preparation of such absorbents and the way in which they are evaluated were described. A newer approach using carbons derived by pyrolysing sugar with different nitrogen compounds, and which is showing promise, was also mentioned.

The final presentation of the morning was made by Dr Michael Green of UCG Engineering Ltd., and was entitled "Underground coal gasification – an alternative approach". His talk covered the technology of directionally-drilled UCG and the potential for it in the UK. Trials on UCG have been carried out from the 1950's onwards mainly in the former USSR, USA and Spain but mostly at shallow depths of around 200 metres. Nowadays, however, depths of 600 to 1,200metres have been used. The reason is that most of the remaining accessible UK and European seams, both onshore and offshore are in deeper seams. With a high-pressure gas produced at the surface, (typically 60-100 bar), the process is well-suited to further gas processing. There is also a greater separation from near-surface aquifers, which has potential environmental benefits and also greater methane and lateral cavity growth.

A European trial of UCG took place near to Zaragoza. It was successful but a number of underground geological and engineering issues were identified following the project. These included the geology of the coal seam, the characteristics of overlying strata and the hydrogeology in regard to water ingress and contaminant dispersal. Engineering aspects included directionally drilling and intersections in thin coal seams, underground instrumentation, process control and high temperature well completion for possibly sour gas. The conclusions of the European UCG trial were that directional drilling produces effective process well configurations and that gasification at greater depth enhances methane formation. The process was controllable and the engineering is largely proven. No adverse environmental effects were detected at the surface.

The UK on-shore resource is huge with UCG potential 17 billion tonnes. UCG could support 28GWe of power generation at five selected power station sites with coal available within 25 km, namely Longannet, Selby/Drax, Scunthorpe, Mersey/Dee area and Port Talbot. The UK offshore potential for UCG is great with potentially inexhaustible coal resource in thick seams. Currently infrastructure exists for drilling, pipelines, platforms which, in turn, provides a convenient CO₂ sequestration option. CO₂ sequestration with UCG is feasible via its transportation to offshore saline aquifers, or abandoned gas/oil reservoirs. In addition, schemes for enhanced oil recovery (EOR) and unmineable coal in the vicinity of UCG projects are options for consideration.

UCG world-wide is gaining credibility. The Chinchilla project in Canada, based on Russian technology is a case in point, (see Newsletter 40 of May 2004). Other work is being done in China at the Erzhuang UCG station and there is a UCG test rig at the Underground Mining Technology Centre, Beijing. Feasibility studies for lignite gasification at Velenje in Slovenia and in the area of the Forth of Firth have been undertaken.

Dr Green concluded that directional drilling uses high pressures for easier CO₂ capture, it has environmental benefits of accessing deep seams, the engineering which is adapted from oil and gas processes is largely proven but that scale-up to commercial operations required. The potential of UCG in the UK is great with large onshore resources and virtually unlimited offshore potential. The cost of electricity at 2p/kWe is lower than IGCC but there are some planning and public perception risks. The development potential of high pressure UCG is significant with China switching interest to this technology. Australia and Europe are re-establishing the UCG option and the Scottish UCG project could exploit the UK lead in deep UCG, if done sufficiently quickly.

After an excellent lunch provided by Scottish & Southern Energy the party split up into those making the site visit and those attending the CRF Executive Committee Meeting. Your editor did not make the site visit, unfortunately, but one of those who did reported back that it was a very enjoyable tour. Here are his thoughts on the tour.

"The party was split into two groups, one visiting the biomass section and the other was shown the boiler and central control room. During the visit, we were shown the mills, boilers, steam turbines and even what it looks like inside one of the boilers. We were then told some general information about the process of how coal is converted into electricity. It was the first time for me, and possibly some of the visitors, to see a real power plant. After that, we visited the biomass store, which is some distance from the boiler house. It was a huge building and there was a very strong smell of biomass inside. We saw biomass in powdered form and were told some of the biomass they bought is in the form of pellets, for example, coconut shell 6-8mm in diameter and 20mm in length. Biomass is then weighed and conveyed to be mixed with coal before sent to the coal milling system. Currently, about 12.5%(wt) of biomass is mixed with coal to be burned in the boiler. For the biomass that have been tested, it is possible to use more than that. However, because the price for biomass is higher than coal due to the high demand on biomass in the market, they need approval from local environmental authority to go further. Among us there were several PhD students and during the visit, we raised quite a few questions. It seems that most visitors were very happy to have an opportunity to make this visit – Wu Tao - University of Nottingham – PhD student".

UK 'failing on greenhouse gases'

BBC Wednesday, 8 December, 2004, 12:42 GMT

The prime minister said the UK was not expected to meet its pledge to cut carbon dioxide emissions to 20% below 1990 levels by 2010. But he stressed it was on course to hit the 12.5% cut demanded in the Kyoto Protocol on greenhouse gases. Friends of the Earth says emissions are currently down just 7.5% - the same as in 1997 when Labour came to power.

'Embarrassment'

The 20% target is a self-imposed goal for the government, which is also outlining in its progress in a consultation on five-year climate change plans on Wednesday. Ministers say the UK will do better than the milder goal set in the Kyoto Protocol - the international agreement to cut all greenhouse gases - which for the UK is 12.5% below the 1990 emissions levels. Last December, the European Commission said only the UK and Sweden were on course with existing policies to meet their share of EU targets. The prime minister has said he wanted climate change to be a key priority during the UK's presidencies of the G8 and EU in 2005. BBC environment correspondent Richard Black said the admission the 20% target would be missed was a "very great embarrassment" for the government ahead of its G8 presidency. It would be difficult to ask developing nations to take action if too little was being done at home, he said. Mr Blair was tackled by Liberal Democrat leader Charles Kennedy, who questioned how the news would affect the prime minister's hopes of leading the industrialised world in the issue. At prime minister's questions, Mr Kennedy asked: "Is it not just again the case, as with so many other things, the prime minister talks a very good game, persuades himself and fails to deliver?" But Mr Blair said the UK was on course to beat the Kyoto target by cutting carbon dioxide emissions by 14% by 2010. More needed to be done, he said, explaining that the government was making energy suppliers make more use of renewable sources.

'Time running out'

News of the British government's failure to meet its targets comes just a day after the US - the world's biggest polluter - again defended its decision not to take part in the Kyoto Protocol. With just two months before the international agreement to cut greenhouse gases comes into force, senior US negotiator Harlan Watson attacked the treaty as being politically-motivated rather than based on science. FoE director Tony Juniper has urged Mr Blair to keep to the 20% pledge. "The UK climate change programme is the last chance for the government to demonstrate it is serious about taking a lead on tackling climate change," he said. "But time is running out. If the climate change programme fails to make significant cuts in UK greenhouse gas emissions, the prime minister's ability to persuade other countries to take the issue seriously will be totally undermined."

'Tough targets'

Environment Secretary Margaret Beckett told BBC News the UK was "not doing as well as we had hoped and we want to do more". "We have set ourselves pretty high targets. Actually we are well ahead of our main legal commitment, but we set ourselves more ambitious targets and we have to do more to try to reach them," she said. Mrs Beckett said she was happy for people to keep pressing the government over the issue because "we do all of us have to do more". She later launched a new energy efficiency programme to deliver a "low carbon economy", including a new drive to make the public realise the urgency of the problem. The Confederation of British Industry insisted that business deserved recognition for making considerable efforts to help tackle environmental problems. John Cridland, CBI deputy director-general, said too many environmental campaigners want to blame business for problems outside the control of companies. "British business has done more than anybody else to tackle climate change," he said. "It is business that is responsible for the innovative policy ideas that have a fighting chance of helping solve the problem."

[Given the following article, was the FENCO Initiative that necessary? ED]

Bush administration isn't putting money where its mouth is on 'clean coal'

By Amanda Griscom Little, Grist Magazine,
03 Dec 2004

When pressed on climate change, the Bush administration is fond of citing "clean coal" technology as the wave of the energy future. Even some enviros are starting to grudgingly acknowledge the technology's potential for good.

But all Bush's talk doesn't appear to be translating into the funding needed to really get clean coal rolling. Given that coal accounts for a whopping 50 percent of U.S. electricity production, it can't realistically be phased out overnight -- or even in the next half-century -- which means that transition technologies are critical. Such technologies are in development, and they could make coal-powered generation almost completely smog-free and easily conducive to capturing and storing carbon-dioxide emissions.

The business community, for its part, is atwitter with excitement over clean-coal developments, particularly given the rising prices of oil and natural gas. Last month, *The New York Times* published a cover story in its business section titled "Fuel of the Future? Some Say Coal," reporting a huge increase in coal-generation investments. Likewise, a leading business newsletter, *Platts*, published a report last week on the ballooning demand for clean-coal facilities.

But despite mounting enthusiasm for the technology, clean coal got short shrift when Congress approved the \$388 billion omnibus spending bill last week. The White House was granted only \$18 million -- a sliver of its \$237 million funding request for fiscal year 2005 -- for its "FutureGen" program to develop zero-emission coal-fired power plants over the next decade.

The program, often touted by the administration as one of its leading efforts to address global warming, centers on a new technology known as "integrated gasification combined-cycle" power generating units (IGCC for short). These next-gen plants do not directly burn coal, as traditional plants do, but pressurize it, thereby producing a gas from which smog-causing pollutants can be easily filtered before the gas is used to power a jet-engine-style turbine (much like the ones in natural-gas power plants). The pressurizing process also releases a stream of carbon-dioxide emissions that can be captured for underground sequestration.

According to **Tom Gavin**, spokesperson for Sen. **Robert Byrd** (D-W.V.), who has been the leading advocate of clean-coal technology on Capitol Hill, IGCC has big environmental advantages over traditional coal plants, plus the technology is proven and ready to go: "Several models have already been built and proved successful. The technology can already reduce key pollutants -- nitrogen oxide, sulfur dioxide, mercury, and particulates -- by more than 90 percent." Gavin added that eliminating carbon-dioxide emissions is also perfectly practicable: "While [the current] models aren't designed to capture and sequester carbon dioxide, it is feasible from a technical perspective for them to do so."

Of course, there are those environmentalists who say it's perfectly foolish. **Dan Becker**, director of the **Sierra Club's** Global Warming and Energy Program, is

loath to call the technology "clean": "There is no such thing as 'clean coal' and there never will be. It's an oxymoron," he said.

The trouble with IGCC, according to Becker, is that carbon sequestration has not yet been proven a successful technique, and extracting coal from the ground can be so damaging in itself that boosting coal generation will inevitably have dire consequences for the environment. He also believes IGCC technology could be used as an excuse to build hundreds of new coal plants, diverting investment from renewables and stalling the shift away from fossil fuels.

David Hawkins, director of the **Natural Resources Defense Council's** Climate Center, has a different take. He points out that coal accounts for more than a third of U.S. CO₂ emissions and nearly 40 percent of global CO₂ emissions. "Coal is an inevitable and substantial part of the global energy mix [for the foreseeable future], so to the extent that we are going to use it, we believe coal-based generation should be IGCC with carbon capture and storage," he told the Center for Investigative Reporting (CIR).

The biggest growth in coal generation will likely occur in developing countries like China, where coal is far more abundant than oil or natural gas. "The best argument for this technology is the developing world," conceded Becker. "China and India have access to an enormous amount of coal that may be burned whether we like it or not." Down the line, he said, carbon sequestration may be their only hope.

Back to the FutureGen

So with everyone from Bushies to greenies touting the potential benefits of clean-coal technology, why did FutureGen -- the program intended to spur IGCC and carbon-sequestration development -- get overlooked in the 2005 budget? The answer, put simply, is that the Bush program is all hat and not much cattle.

"The administration pays lip service to this project, but will have to spend more political capital to actually move this technology," said **Rusty Mathews**, a former Senate staffer who worked on the Clean Air Act amendments of 1990 and is now a legislative specialist with the law firm of **Dickstein, Shapiro, Morin & Oshinsky**. "IGCC technology is the ultimate integration of environment and energy policy, it is the future, but it still needs funding to get off the ground. The Bush administration is not committing the resources and planning necessary to make it happen."

In fact, the \$18 million that Congress granted for the program was all that the administration had earmarked to spend for 2005 -- no plan had been outlined for what to do with the additional \$219 million it requested. Moreover, the money for FutureGen wouldn't have been new funding, exactly, but a diversion of money from other clean-coal technology projects.

Critics say that the Bush plan would do nothing for clean coal in the near term. FutureGen aims to get just one prototype up and running by 2008 -- an anemic goal given that the technology exists today to have four or five plants built in the next several years.

"Our nation's energy future will be built upon the decisions we make today [to] support new research and technologies that contribute to an energy-independent and environmentally sound America," Byrd told CIR. "But shortchanging these technologies, as the Bush White House has done time and time again, only undercuts our nation's energy independence and national security."

Part of the problem is that there's hesitancy within the coal industry to embrace this paradigm shift; IGCC technology is currently some 20 to 30 percent more expensive than traditional systems. Economies of scale will take care of that eventually, but in the meantime industry is concerned that once the technology is on the market they'll be pressured to upgrade their plants.

According to Mathews, the Bush administration is using FutureGen as an excuse to avoid taking real action on climate change. "Basically it's a dodge," he said. "Whenever they're asked about climate change, they say we don't need caps on carbon emissions. We don't need regulations. We'll solve this problem by throwing money at emerging technologies -- with FutureGen and FreedomCAR (** see below) -- so leave us alone!"

IGCC advocates hope that with increasing pressure on Bush to address the reality of climate change, from both the domestic and international fronts, at the very least he will take FutureGen more seriously, aggressively subsidizing IGCC technology and stepping up the timetable rather than waiting 10 years for it to take shape.

For the time being, however, FutureGen is just another cryptically named environmental gimmick from the Bush team: "You could call FutureGen 'FreedomCAR without wheels,'" Hawkins told CIR. "The problem, fundamentally, is that the Bush administration fails to grasp the urgency of climate change. What they don't understand is that when your roof is burning, you don't research fire-suppression methods, you call the fire department."

[** for those who don't know - like the editor!! "FreedomCAR is a US Industry/Government research initiative focused on collaborative, pre-competitive, high-risk research. Its aim is to develop the component technologies necessary to provide a full range of affordable cars and light trucks that will free the nation's personal transportation system from petroleum dependence and from harmful vehicle emissions, without sacrificing freedom of mobility and freedom of vehicle choice".]

Fossil fuels without the fossils

Chemistry World, November 2004 Page 23.

For countless years, chemistry students have been taught that fossil fuels, such as natural gas and oil (and coal! ed.), are derived from prehistoric organisms - hence the name. A number of scientists have attempted to question this accepted scientific truth by arguing that fossil fuels could be produced inorganically, but this theory has never been given much credence. Now, however, US researchers could be beginning to change all that. The team, composed of physicists from Indiana University and the Carnegie Institution and chemists from Harvard University and the Lawrence Livermore National Laboratory, has successfully generated methane, which is the main component of natural gas, from inorganic materials exposed to high pressures and temperatures. This result will not only force scientists to re-evaluate their theories of fossil fuel formation, but also raises the possibility that large reservoirs of fossil fuels could exist deep inside the Earth. Using a diamond anvil cell, the researchers exposed calcite (CaCO_3), an iron oxide (FeO) and water to pressures of 5-11 gigapascals (GPa) - 50,000 to 110,000 times the pressure at sea level - and temperatures from 500°C to $1,500^\circ\text{C}$. These conditions mimic those thought to occur in the Earth's mantle, which lies between 50km and 250km below the surface and where CaCO_3 , FeO

and water are thought to be present. Using Raman spectroscopy, the researchers detected the production of methane in the form of bubbles at a wide range of pressures and temperatures, although the process was most efficient at temperatures of around 500°C and pressures of around 7GPa. The researchers propose that the methane is formed by the reduction of calcite and suggest that it could be similarly produced from any carbonate species. They also raise the possibility that heavier hydrocarbons could be generated in the mantle using methane as a precursor. "Although it is well-established that commercial petroleum originates from the decay of once-living organisms, these results support the possibility that the deep Earth may produce abiogenic hydrocarbons of its own", explains head researcher Henry Scott of Indiana University.

Titanic Disaster: New Theory Fingers Coal Fire

2004 Denver Annual Meeting (November 7–10, 2004),
Geological Society of America.

Story based on paper presented by Bob Essenhigh

A smouldering coal fire – and the continuing attempt to control it through the voyage – may have led to the sinking of the Titanic 92 years ago, says engineer Robert Essenhigh of Ohio State University. While everyone knows it was a collision with an iceberg that sank the White Star Liner on her maiden voyage, nobody knows why the Titanic was sailing full steam through a known iceberg field at night. Coal's tendency to ignite and smoulder while stored may provide the answer, says Essenhigh. There are records that there was such a fire in the Titanic's forward bunker #6. Essenhigh presented his theory at the annual meeting of the Geological Society of America, November 7th 2004, in Denver, in a session entitled Wild Coal Fires: Burning Questions with Global Consequences? First of all, says Essenhigh, it's important to rule out the reason for speed put forth in the movies: to set a speed record or impress other sailors. The crew of the Titanic couldn't have been trying to break any records crossing the North Atlantic Ocean, says Essenhigh, because according to the published records the Titanic was built for comfort, not speed. "There was a further problem that because of a miners strike, there wasn't originally enough coal on the ship for sailing at full speed and the original plan was to sail at half-speed and take it easy," Essenhigh said. "It wasn't designed as the fastest ship." Plus, according to the published records, the crew was getting radio reports of icebergs from other ships, so a slow down would have made sense. There are reports that one ship in the area was so cautious that they stopped dead in the water to await daylight before proceeding, he said. So if there was a reason for the speed, it had to be something important – like a fire in the coal bunker that needed to be kept under control and then put out as soon as the ship reached port. The standard technique for controlling and eliminating such fires on steamships was to increase the rate at which the coal was being removed from the bunker and put into the steam engine boiler in order to increase the rate of draw-down of the coal pile, Essenhigh explains. When the firemen reached the smouldering fire they would just shovel it into the boiler and the problem was solved. Of course, all that shovelling makes for a lot of steam, resulting in the need to increase the steaming rate and quicker cruising. Historical records show that on leaving dock each of the six of Titanic's coal bunkers were only about half-full with 800 tons of coal. Based on laboratory experiments on coal burning rates done at Sheffield University in the 1950s, Essenhigh estimates that at full throttle, the Titanic's coal supply would have been dropping at about an inch per hour. If that is correct, a festering fire halfway down the coal pile would have been burning up at about the same rate as it was being drawn down and would not have been reached and removed by the time of the iceberg collision. There would still be a reason for the

speed on that fateful night. "It's very speculative," Essenhigh admits. But not far fetched. Smouldering fires in piles of coal even today is a common thing – and there are even records from fire control teams at the ports of Southampton and Cherbourg that such a fire was burning onboard the Titanic. "This was a chronic problem," says Essenhigh of coal fires on all coal-fired steam ships and even in coal-fired power plants today. "If the fire is there you know it's there and it's very difficult to get it out."

\$2.5m grant awarded to build one of world's cleanest coal plants

Power Engineering - 11 November 2004

A \$2.5m grant from the Illinois clean coal review board is to help a coal facility become one of the cleanest coal-fuelled energy plants in the world. Steelhead Energy Company LLC, a project development company affiliated with ArLight Capital Partners, LLC, was awarded the grant for the initial phase of detailed engineering design for the Southern Illinois Clean Energy Centre. The energy centre will include a coal gasification facility to be located at the site of a new, subsurface mine in Williamson County, Illinois. The first facility of its kind in the US, it will use local coal to generate 545 MW of electricity and 95 million standard cubic feet per day of substitute, pipeline quality, natural gas in two separately owned and financed projects. In a related development, Steelhead Energy has filed an air quality construction permit application with the Illinois environmental protection agency, which will regulate air emissions from the facility. When built, the plant will be among the cleanest coal fuelled energy facilities in the world. Fluor Corporation, along with Conoco Phillips, will be conducting the detailed engineering design, with the two firms expected to ultimately construct and operate the facility. Both processes first convert the coal into a gas where potential pollutants such as sulphur, mercury and ash are economically removed from the gas prior to combustion. The sulphur and ash may be sold commercially. This approach is said to allow greater removal of these pollutants than is feasible with conventional coal fired power plants. The Illinois clean coal review board provides grants to innovative technologies seeking to increase the utilisation of the extensive coal resources in southern Illinois in an environmentally beneficial manner. Steelhead Energy has promised to repay the grant out of the construction funds for the project.

China plans to stabilise coal supply.

Business Report – Friday 12th November 2004.

Beijing - China will keep its coal export quota of some 80 million tonnes unchanged next year, claiming it wants to stabilise coal supply in the international market, state press reported Thursday. "Considering the strong coal demand in the international market, China chose to act as a responsible coal supplier despite serious shortages of coal in the domestic market," the Beijing News quoted State Development and Reform Commission (SDRC) official Fu Bingqi as saying. Quotas are based on coal companies previous exports and their ability to fulfil demand. The SDRC will release the first quotas for 2005 by the end of this year and the second set about six months later. China has been reducing exports in recent years due to increased domestic demand as the country's energy-hungry economy expands at more than 9% annual growth. Export quotas were set at 100 million tonnes in 2003. Last year, China produced 1.7 billion tons of coal. Production increased 54 percent from 1999 to 2003.

UK doles out cash for underground coal equipment

Nov-11-04 World Mining Equipment 2004

The UK Government is giving £16.5 million in aid to nine British collieries with UK Coal the big winner. Britain's largest coal producer, UK Coal, will receive some £14 million in all, which will be used to buy new equipment and invest in new development at the Daw Mill, Harworth, Kellingley, Maltby, Rossington, Thoresby and Welbeck operations. UK Coal specifies it will buy new roof supports for Daw Mill; face equipment for Harworth; face equipment and a winder upgrade for Kellingley; face and development units for Maltby; face, development and conveying equipment for Thoresby. These operations will also benefit from new development, as will UK Coal's Rossington and Welbeck operations. Daw Mill is of particular note as it operates a 5m high seam, so the supports will be purpose-built for the mine. The Eckington Colliery Partnerships and Aberpergwm mines will receive the balance of the funding. The UK Government's Coal Investment Aid programme was started in 2003, to safeguard the country's energy supply, which relies heavily on coal.

Cinergy to convert 160-MW plant to coal gasification

POWER-06/10/04

Cinergy Chairman, President and CEO James Rogers said the company plans to convert a 50-year-old coal-fired plant to an integrated coal gasification combined-cycle station and hopes other companies take similar steps to ensure that coal stays in the nation's energy mix under future federal regulations or legislation to reduce emissions. IGCC "may not make economic sense today," but the cost would decrease if the technology is commercialised and improved, Rogers said. Pulverised coal generation costs \$1,000/kW of installed capacity compared with the \$1,400/kW of IGCC, but gasification would better allow the industry to address potential carbon-dioxide restraints in the future, he said. Energy companies must make decisions now to meet their future load growth despite a lack of direction from Congress and the U.S. Environmental Protection Agency on emissions. Cinergy is looking at converting its 160-MW Edwardsport plant in central Indiana to a state-of-the-art IGCC commercial plant. Preliminary engineering is under way, first proposed by the Kennedy School of Government as a private-public partnership. The project also is in keeping with Cinergy's goal to reduce its CO₂ emissions 5% during the next decade, Rogers said.

Southern Company Demonstrates Technology Designed to Reduce Fly Ash Emissions From Coal-Fired Power Plants

ATLANTA, Nov. 9 /PRNewswire-FirstCall/ --

Southern Company today announced that it has successfully completed initial testing and evaluation of a technology designed to reduce fly ash emissions from power plants. The tests of the Indigo Bi-Polar Fine Particulate Agglomerator, an Australian-developed technology, were conducted at Plant Watson in Gulfport, Mississippi, which is owned and operated by the company's Mississippi Power subsidiary. "This technology shows great promise in reducing fly ash emissions," said Charles Goodman, Southern Company senior vice president of research and environmental policy. "This is a significant new development in a maturing field,

and we are encouraged by the results." Demonstration of the Bi-Polar Fine Particulate Agglomerator device is part of Southern Company's ongoing commitment to research and develop environmental control technologies that will reduce the impact of its operations on the environment. In 2003, Plant Watson Unit 4, a 250-megawatt coal-fired electric generating unit, was the first site in the U.S. to install the Indigo agglomerator technology for testing on U.S. fuels. Extensive testing was completed on five coals; two domestic (Colorado and Illinois Basin) and three South American coals. All but one of the coals demonstrated significant results with fly ash emissions reduced, on average, 50%. The Indigo agglomerator is installed in front of an existing unit's electrostatic precipitator. It charges half the fly ash particles passing through with a positive electrical charge, and the other half with a negative electrical charge. These oppositely charged particles are then carefully mixed to insure intimate contact. Once contact is made, the fly ash particles stick together and agglomerate into much larger particles. The large particles are then more easily collected by the existing electrostatic precipitator. "We've installed high efficiency electrostatic precipitators at all of our coal-fired power plants, which remove on average 99.5% of emissions of larger fly ash particles," added Goodman. "If the Indigo technology continues to perform well at our plants, it will allow us to have an even greater impact on the total amount of fly ash particles that are captured and not released into the environment." This fall, Southern Company will install the second Indigo agglomerator in the U.S., and conduct further testing of the technology at Plant Hammond Unit 3, a 115 MW unit, owned and operated by the company's Georgia Power subsidiary, near Rome. The installation at Plant Hammond will be on a vertical plant configuration versus the horizontal configuration at Plant Watson. This design change from horizontal to vertical will allow the company to evaluate the operation of the technology for application on additional plants within the Southern Company system.

With more than 4 million customers and nearly 39,000 megawatts of generating capacity, Atlanta-based Southern Company (NYSE: [SO](#)) is the premier super-regional energy company in the Southeast and a leading U.S. producer of electricity. Southern Company owns electric utilities in four states, a growing competitive generation company, an energy services business and a competitive retail natural gas business, as well as fiber optics and wireless communications. Southern Company brands are known for excellent customer service, high reliability and retail electric prices that are 15 percent below the national average. Southern Company has been named three consecutive years No. 1 on Fortune magazine's "America's Most Admired Companies" list in the Electric and Gas Utility industry. Southern Company has been ranked the nation's top energy utility in the American Customer Satisfaction Index five years in a row. Southern Company has more than 500,000 shareholders, making its common stock one of the most widely held in the United States.

Vinacoal rides on road to success

<http://vietnamnews.vnagency.com.vn/Home.htm> 15th November 2004

HA NOI — The Viet Nam Coal Corporation (Vinacoal) will produce 35 million tonnes of coal this year (2004), 11 million of which are earmarked for export, reported Vinacoal general director, Doan Van Kien. Kien attributes Vinacoal's success to the efficiency measures implemented in the sector in the ten years since the corporation was established. Domestic coal consumption is four times higher now than it was ten years ago and five times as much coal is exported. However, the number of coal workers has remained unchanged, Kien said.

Vinacoal is not just in the coal production business, but also assists with the building of electric power plants. It has reorganised the operation of its factories that produce modern equipment for coal mines, and also for electric power plants, cement plants and vehicle and ship assembly.

Viet Nam now exports coal to 30 countries and territories including China, Malaysia, the UK, Australia, and South Africa. Great efforts were made in balancing the exploitation and consumption of coal on a large scale to meet the challenges posed by a market economy. Coal companies have been specialising in increased production capacities and coal quality, while trade companies find more markets for their product, Kien said.

Vinacoal has co-operated with Japan, China, Russia, Poland and Ukraine in improving extraction facilities in mines. Cua Ong Port, in the northeast province of Quang Ninh, has been redesigned to accommodate bigger ships.

The corporation plans to sell 25-26 million tonnes of coal next year. It is researching technology to exploit areas in the Hong (Red) River Delta which potentially contain billions of tonnes of coal. If all goes according to plan, Vinacoal will build the first mine there sometime after 2010. All estimates show this will raise coal capacity to more than 50 million tonnes a year by 2020.

China's miners pay for growth

Wednesday, 8 December, 2004, 01:42 GMT
Mary Hennock BBC News business reporter

China's vibrant economic growth is built on coal, the source of two thirds of the country's electricity. Digging out that coal cost the lives of 15 miners a day in the first nine months of this year, official accident figures show. China's leaders are now grappling with a predicament - how to speed up coal output, ending the chronic power shortages that caused blackouts in 24 provinces last summer, whilst improving mine safety. The country's worst mining disaster for a decade has taken safety up the agenda. After 166 workers died in the Chenjiashan explosion in November, the State Council ordered an inquiry and newspaper editorials called for a more humane and balanced view of economic progress. A typical editorial in China Daily said the authorities should pursue "more serious actions for safety despite an energy shortage".

Deadly risks

China has two kinds of mines: big, state-run mines, which are generally thought to be safer, and smaller private mines where the majority of deaths occur. "They're technically illegal, but they also have certificates. They pay money and get a licence," says film-director Li Yang, who spent 18 months making a film, *Blind Shaft*, set in small, private mines. During filming, he lived in half a dozen mines and spent 50 hours underground. He counts himself "lucky" to have been asleep in the pit-head dormitories when a roof collapse killed two miners. The response was matter-of-fact. "They cleared up the debris, cleared the shaft, treated it no differently from a traffic accident." Miners had helmets and lamps, but most wore soft rubber boots. He never saw steel toe-caps. Ear muffers? He laughs at the question. "They had no training." Miners worked 10 hours a day, seven days a week, earning roughly 1000 yuan (\$120; £62) a month. Pay was linked to how much coal they cut. Gas is the biggest killer, but miners often carried on working "even when it's close to the warning level", says Li Yang.

Local corruption

Small private mines flourish where the coal seams are too narrow to be cut by machinery, but China's insatiable demand for coal creates a market for every lump. Local governments often prefer to sell the licences and collect profit-based fees or taxes than run the mines themselves. "They have very little regard for anyone's safety - there's signals out there that no matter how much coal they produce they can sell it so they're trying to jack up production as much as possible," says Jeffrey Logan, a senior energy analyst at the International Energy Agency (IEA). Beijing's solution is to consolidate the industry into 13 large companies, according to an official with the influential National Development and Reform Commission. The plan will "ensure stable supplies and safety", China Daily quoted him as saying. Similar plans have been tried before, and failed. A national drive to shut illegal mines in late 1990s had only a brief impact. The State Administration of Work Safety has repeatedly ordered vigorous safety checks, and last year it imposed a record 21m yuan fine after 72 died in one explosion. "Many mines simply wait until inspections are finished or officials leave the area and then they reopen," a report by China Labour Bulletin, a Hong Kong based workers rights group found.

Surging demand

China's coal output rose 15% in each of the last two years because of strong demand, says Mr Logan. Big state-run mines are supposed to have safety staff always on duty, but demand for coal seems to be lowering standards. The Chenjishan disaster paints a vivid picture of managerial impunity. It had reportedly failed a safety test days before the explosion, and had frequent fires. Relatives of the dead blame managers' pursuit of a 400,000 yuan bonus for beating output targets. The overall impact of government policies, combined with China's not-quite market economy is to limit investment in bigger, more controllable mines while encouraging a free-for-all. Coal prices have risen - to between \$32-40 a ton at the industry benchmark depot in Qinghuandao - but prices paid by power generators are much lower. The result is that state-owned mines are "starved for investment" and unable to expand or improve efficiency, said Mr Logan.

A move away from coal is not on the cards, though use of hydro and nuclear power is growing. China is the world's biggest coal producer - 1.8bn tons in 2004 - with the third biggest reserves globally. The IEA expects coal still to be providing 53% of China's energy by 2030. And if economic growth stays on course, the IEA predicts China will account for 25% of the world's increase in electricity generation in the next 30 years. Most observers, including labour rights activists, believe central government has tried hard to improve mine safety but they are not optimistic it can succeed. "Central government can approach this with a policy towards the public good, whereas the local governments are concerned only about maximising their profits," says Mr Logan.

Tailings

RWEnpower is considering plans to build a 2,000 MW gas-fired power station in Pembroke, close to two proposed gas import terminals at Milford Haven. 28-Oct-2004

Aberthaw Power Station is in talks with Horizon Mining about the possibility of buying coal from the Pentreclwydau colliery in the Neath Valley, which could be reopened by Horizon Mining with the creation of 60 jobs. 12-Oct-2004

Rutland Fund has acquired Uskmouth Power Company, the operator of the Fifoots coal-fired power station at Newport in South Wales, and will restart the site with a workforce of about 100. 06-Jul-2004

AES Kilroot is to invest £35m in the installation of flue gas desulphurisation equipment at its power station in Northern Ireland. 02-Jul-2004

Student Bursaries for 2005

Up to 6 travel bursaries for up to £300 are on offer to bona-fide full-time students wishing to attend appropriate 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
SChEME
The University of Nottingham
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.

Update on current EPSRC projects – subject Coal Technology, (as of December 8th 2004).

1. New Catalysts for the Hydrocracking of High RMM Fractions of Coal-derived Liquids And of Heavy Hydrocarbon Liquids.
Principal Investigator: [Professor AV Bridgwater](#)
Other Investigators: [Dr JA Hriljac](#)
Project Partner: Volclay Ltd
Department: Sch of Engineering & Applied Science
Organisation: Aston University
Starts: 1 April 2002 Ends: 31 March 2005, Value: £94,361
2. Investigation of Synergistic Activity During the Co-Pyrolysis of Coal and Biomass. Principal Investigator: [Dr JM Jones](#)
Other Investigators: [Professor KD Bartle](#), [Professor A Williams](#)
Department: Fuel and Energy
Organisation: University of Leeds
Starts: 1 July 2003 Ends: 30 June 2006, Value: £189,327
3. JREI: Thermal Analysis Equipment to Underpin the Fuel Technology Programme Encompassing Clean Coal Research .
Principal Investigator: [Professor CE Snape](#)
Other Investigators: [Dr M Cloke](#), [Dr E Lester](#)
Project Partners: Powergen U K Plc, TXU-Europe, CPL Environmental & Analytical, Thermal Instruments Ltd., Perkin Elmer Ltd., BCURA.
Department: SChEME Organisation: University of Nottingham
Starts: 30 April 2002 Ends: 29 April 2005, Value: £65,256
4. Modelling the Uncertainty and Risks Associated with the Design and Life Cycle of CO₂ Sequestration in Coalbed Methane Reservoirs.
Principal Investigator: [Dr A Korre](#)
Project Partner: Alberta Research Council
Department: Environmental Science & Technology
Organisation: Imperial College London
Starts: 1 September 2003 Ends: 31 August 2006, Value: £126,960

5. New Catalysts for the Hydrocracking of High RMM Fractions of Coal-derived Liquids and Heavy Hydrocarbon Liquids.
Principal Investigator: [Professor R Kandiyoti](#)
Other Investigators: [Professor DR Dugwell](#), [Dr AA Herod](#)
Department: Chemical Engineering & Chem Technology
Organisation: Imperial College London
Starts: 1 December 2001 Ends: 30 November 2004, Value: £110,715

6. YAN-CE: Young Academics Network for Chemical Engineering
Principal Investigator: [Dr MJH Simmons](#)
Other Investigators: [Dr P Styring](#), [Dr W McMinn](#), [Dr B Saha](#), [Dr P Lettieri](#), [Dr P Linke](#), [Dr Y Ding](#), [Dr KVK Boodhoo](#).
Department: Chemical Engineering
Organisation: University of Birmingham
Starts: 1 April 2003 Ends: 31 March 2006, Value: £63,478

Total number of projects: 6

Total value of support: £650,098

CALENDAR OF COAL RESEARCH MEETINGS AND EVENTS

Date	Title	Location	Contact
Late January/ Early February 2005	Re-launch Meeting of the Environment Division, Title to be Announced	Venue to be Announced	Dr M Whitehouse Casella CRE Energy Building 7/3 Vantage Point Business Village Mitcheldean GLOS. GL17 0DD Tel: 01594-546334 Fax: 01594-546342 Email: michaelwhitehouse@casellagro.com
February 22-23 2005	McCloskey's 3rd Asian Coal Conference 2005	Shangri-La Hotel, Kuala Lumpur, Malaysia	http://www.abc-asia.com/Asian-Coal/AsianCoalIntro.htm# Shangri-la Hotel Kuala Lumpur, Malaysia 11 Jalan Sultan Ismail 50250 Kuala Lumpur, Malaysia Tel: 603-2032 2388 Fax: 603-2070 8616 Contact: Ms. Winnie Lim, <i>Event Manager</i>
April 13 2005	Meeting of the Coal Preparation Division, "Coal Preparation and Handling, Where We are at Present, What is Being Developed and What Needs to be Done"	The Coal Authority, Mansfield, Nottinghamshire NG18 4RG	Mr AW Howells Tel: 01226 730440 Fax: 01226 730688 E-mail: andrew.howells@norec.ltd.uk
April 17 - 21, 2005	The 30th International Technical Conference on: Coal Utilization & Fuel Systems Coal Technology: Yesterday – Today – Tomorrow	Sheraton Sand Key Hotel Clearwater, Florida, USA	Presented by: U.S. Department of Energy http://www.fe.doe.gov Coal Technology Association & American Society of Mechanical Engineers - Fuels & Combustion Technologies Division http://www.asme.org/divisions/fact/ in co-operation with the National Energy Technology Laboratory, U.S. Dept. of Energy http://www.netl.doe.gov

April 26-28 2005	COAL 2005 6th Australasian Coal Operators' Conference and Workshop	Sheraton Hotel, Brisbane, Australia.	Alison McKenzie, Senior Conference and Events Co- ordinator, The Australasian Institute of Mining and Metallurgy PO Box 660, Carlton South, Victoria, Australia 3053 Telephone: +61 3 9662 3166 Facsimile: +61 3 9662 3662 Email: conference@ausimm.com.au Website: www.ausimm.com
May 10-12 2005	Second International Conference on Clean Coal Technologies for our Future.	Sant'Elmo Beach Hotel Conference Centre, Castiadas, (Cagliari), Sardinia, Italy	Conference website for details http://www.cct2005.it
August 17-19, 2005	COAL-GEN 2005	San Antonio, Texas	Conference website for details http://cg05.events.pennnet.com/content.cfm?NavId=2072&Language=Engl To register: MAIL: COAL-GEN 2005 Registration Department 1421 S. Sheridan Road Tulsa, OK 74112-6600 USA E-MAIL: coal-gen@pennwell.com
September 11-15, 2005	22 nd International Pittsburgh Coal Conference	Westin Convention Center, Pittsburgh, PA,USA	Contact web site for details: www.engrng.pitt.edu/~pccwww/Planning.htm
October 9-14, 2005	2005 International Conference on Coal Science & Technology	Okinawa, Japan	Japanese Representatives to ICCS Prof. I Mochida , Kyushu University Dr. O Yamada , AIST General Secretary http://www.aist.go.jp/ Ms. Yoshimi Kunugi , AIST E-mail: iccst@m.aist.go.jp Telephone:0081-29-861-8423 Facsimile: 0081-29-861-8417