

NEWSLETTER



*of
the
Coal Research Forum*



EDITOR'S MUSINGS:

On behalf of the Executive Committee I would like to wish season's greetings to all of our members and to any new readers. We hope that the festive season has been just that although times are becoming increasingly difficult for many of us. There is at least one thing to look forward to now that we are into 2012. No, I am not referring to the Olympic Games but of course the 9th ECCRIA which will be held at the University of Nottingham from the 10th to 12th September. For those who have not had a look at the website you can easily do so by clicking on this link <http://9.eccria.org/ibis/eccria9/home> . Don't forget you can upload your abstracts directly to the website now.

This newsletter also contains reports from two very successful joint CRF events; one concerning the European Industrial Emissions Directive and the other on sustainability in the UK minerals industry. Both were well attended and well received. There is also a report on the 60th BCURA Coal Science Lecture given this year by Brian Ricketts of EURACOAL.

The Committee and the editor hope that the newsletter is interesting and possibly useful to the readership but we would welcome any feedback that you feel you might wish to make. We would welcome approbation but the editor has broad enough shoulders to take any critical suggestions should he receive them. If we do not hear from anyone we assume, hopefully correctly, that we are doing the right things.

Can I finally wish you all hope for an improving and successful 2012 in whatever way this may be achieved.

Contact Details:

Secretary
Dr David McCaffrey
The Coal Research Forum
P.O. Box 154,
Cheltenham GL52 5YL
Tel: 01242 236973
Fax: 01242 516672
e-mail: mail@coalresearchforum.org
Website: <http://www.coalresearchforum.org>

Newsletter Editor & Treasurer
Dr Alan Thompson
The Coal Research Forum
Tel: 01332 514768
e-mail: alan.thompson5511@btinternet.com

Student Bursaries for 2012-2013

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 requirements for eligibility for award of a bursary are that the recipient will submit a short report about his or her impressions of the conference to the Newsletter Editor for inclusion in the next edition. In addition, the report will provide some brief details of the beneficiary, their topic of study and the reasons for wishing to attend the conference.

“The European Industrial Emissions Directive, (IED)”
Department of Chemical Engineering,
Imperial College London.
22nd September 2011

Report by Dr Chris Satterley, E.ON New Build & Technologies Ltd.

Over 70 scientists, engineers and civil servants attended the recent European Industrial Emissions Directive Seminar in London jointly hosted by the Coal Research Forum (CRF), Combustion Engineering Association (CEA) and Royal Society of Chemistry Energy Sector (RSC-ES). The meeting was opened by David Gent, Vice-Chair of the CEA, who welcomed the attendees and outlined the role and activities of the CEA, CRF and RSC, including the CEA's important role representing UK industrial-scale boiler users on LCPD and IED issues and within relevant technical working groups. Mr Gent chaired the first session.

The keynote presentation was delivered by Mr Richard Vincent, Head of Industrial Pollution Control, DEFRA. Mr Vincent presented a comprehensive review of the European Industrial Emissions Directive (IED). The presentation highlighted that the IED was a recasting of 7 other European Directives concerned with industrial emissions (including the LCPD, IPPC & WID). Mr Vincent stated that overall a great deal remains unchanged in the IED from previous directives, but that much of the change was concentrated in the area of Large Combustion Plant (> 50 MW_{th}) with new, reduced emissions limits for both current and new plant. Mr Vincent then went on to highlight the fact that, unlike the LCPD, the IED's emissions limit values (ELVs) could only be finalised based on the adopted Best Available Technique (BAT) conclusions from the BREF documentation that was still in the early stages of production. The IED is due to come into force for existing Large Combustion Plant from the 1st of January 2016. The presentation rounded up with information on the Transitional National Plan (TNP) arrangements that could be employed by member states to manage their move into the new IED regime and Mr Vincent confirmed that he fully expected the UK to utilise the TNP and other arrangements within the IED to assist industry in making that transition.

Dr Tim Rotheray from the Combined Heat and Power Association (CHPA) followed on with a view from the users of combustion plant. Dr Rotheray stated that the CHPA broadly supported the IED and welcomed the news that the LCP definition was maintained at 50 MW_{th} and above. However, concern was expressed at the ELV levels and their impacts on small, currently operational plant. CHP users were concerned that the investment costs needed to meet these limit values could be excessive and potentially commercially damaging. Dr Rotheray finished

with a plea to regulators that the IED should be considered in the wider policy context when applying it to LCP.

Anthea Day, Sembcorp Industries (operator of boiler plant at the former ICI Wilton site) reported on the activities of the CEA, IED and BREF Technical Working Group and her role as representative on the BREF Seville Technical Working Group. Ms Day described the UK's position on the last BREF exercise as there being a lack of data on which the BREF was based and that more data was required for the latest BREF currently in production in Seville. The IED gives three options for operators of large combustion plant; 1) Comply with the ELVs, 2) Join a TNP (emissions trading schemes) or 3) opt for limited life derogation (up to 17,500 hours) an option much more suitable for utility operators rather than industrial. Ms Day finished her presentation with an update of the latest status of the BREF process; inputs to this have been coordinated in the UK by the CEA Technical Working Group for industrial boilers.

Steve Freeman from the Confederation of Paper Industries was next to give a view from his sector. There are currently 42 paper mills operational in the UK all operating under the EUETS as of 2010, supplying 4.2 million tonnes of paper products per annum. Mr Freeman detailed the reduction in the number of mills by over 50% in the last 10 years in the UK and expressed concern over some of the changes being brought in by the IED. In particular, concern was expressed about the consultation timescales within the IED and the fact that the BREF was significantly delayed, leading to uncertainty over ELVs. Mr Freeman also discussed the effects of the interactions of the IED with other legislation that may further increase costs to his sector that were not foreseen in the individual legislation and the effects on emissions from transport that also affect the paper industry.

John Henderson from the Environment Agency began the second session (chaired by Prof. Mercedes Maroto-Valer, Chair of the RSC Energy Sector) by providing details about the Agency's expectations for the transition to the IED arrangements and added further description of the TNP and limit life derogations available under the directive. Mr Henderson also stated that there was a unified UK position obtained in the Technical Working Groups between the government, NGOs and industry on the LCP BAT going into the BREF process, putting the UK in a relatively strong position. Also mentioned was the requirement, in the IED, for new plant to be carbon capture ready and the cost implications this may have. Mr Henderson finished by confirming the Agency's commitment to work with industrial partners to help them comply with the IED.

Dr Ian Rodgers, RWE npower plc, gave a perspective of the challenges faced by the utility sector and particularly RWE plant in the UK. Some new challenges for the sector include defined ELVs for CCGT plant (not present in the LCPD) and tighter SO₂ and dust ELVs for coal plant, although the flexibilities put in place in the final IED draft were welcomed. The utilities sector is facing decisions on which of the 3 routes allowed in the IED to take and this is likely to be undertaken on a plant-specific basis (as for the LCPD). Dr Rodgers highlighted that due to the link between ELVs and BAT conclusions, some decisions on this may have to be made without full knowledge of the requirements, increasing their inherent risk. He also mentioned the effect of other legislation such as the National Emissions Ceiling Directive and the Gothenburg Protocol on mercury emissions and that their interaction with the IED was important in determining the overall costs to the sector.

Mr Nigel Webley, Hamworthy Combustion Engineering Ltd., discussed the impact of the IED on oil & gas burners for LCP applications. Overall the picture presented was encouraging in that gas and gas oil low NO_x burners were already capable of meeting the requirements of the IED under Appendix V. The only issue was reducing emissions with Heavy Fuel Oil usage.

Mr Peter Quinn, Tata Steel Europe, discuss the Steel Industry's perspective on the new legislation highlighting concerns with the new status of BAT AELs in determining ELVs. Mr Quinn stated that there was concern that this reduced the discretion of the competent authority in the member state to set appropriate emissions limits that genuinely had best

environmental benefit. Also of concern was the rigour of the BAT/BREF process with limit data being the basis for the current BREF document. Mr Quinn finished his presentation outlining why he felt that the Iron and Steel LCP should be considered a special case under the LCP BREF due to some of the technical difficulties in applying abatement.

The final presentation of the day was delivered by Mr David Gent, this time representing British Sugar plc. Mr Ghent outlined the current status of the sugar industry in the UK and the interesting fact that British Sugar is also one of the largest tomato producers in the UK utilising CO₂ from their CHP flue gas. Mr Gent echoed many of the concerns addressed above around the IED, but was also keen to look at its implications beyond combustion such as the requirement for additional inspections and waste capacity threshold. Mr Gent finished his presentation by stating that there was a need to recognise the value of CHP in the BREF, BAT and ELVs.

The meeting was brought to a close by Dr Trevor Drage, Chair of the Environment Division of the CRF with a short question and answer session. Overall, the meeting provided a significant amount of information on the IED and highlighted the common concerns across all industry sectors of the impacts of the new status of the BREF on existing plant and the need to consider the IED in the broader legislative and policy context.

BCURA 2011 Robens Coal Science Lecture
Institute of Physics
London
3rd October 2011

The 60th BCURA Robens Coal Science Lecture took place on 3rd October 2011 at the Institute of Physics in London, where around 90 participants met and mingled for tea and coffee prior to the presentation. The lecture this year, entitled "Addicted to Coal" was given by Mr Brian Ricketts, the Secretary-General of the European Association for Coal and Lignite (EURACOAL). Like all of the presenters of this prestigious lecture, Brian is an eminent expert in his field having worked for Alstom Power Ltd. with responsibility for dynamic modelling of power systems, UK Coal Mining Ltd., initially as project engineer on a new coal-fired plant and subsequently leading UK Coal's lobbying activities, as the Coal Analyst for the International Energy Agency in Paris, and currently as the Secretary-General of EURACOAL in Brussels.

Brian said he felt very honoured to be asked to give this lecture and that it would be a challenge for him to come up with something that had not been said before. However, he hoped that he would be able to provide an interesting talk and whether everyone really was 'Addicted to Coal', as his title suggested, might be a little clearer by the end of his presentation.

Brian began by explaining that EURACOAL is the umbrella organisation of the European coal industry and that it had evolved in 2002 from the European Solid Fuels' Association - CECSO - after the expiry of the ECSC treaty which established the European Coal and Steel Community.

Brian's first slide showed that EURACOAL comprises 35 members from 20 different countries including national producers and importers, associations, companies and research institutes. Member nations include Belgium, Bosnia-Herzegovina, Bulgaria, the Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, Poland, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Turkey, the Ukraine and the United Kingdom. The UK membership comprises COALPRO, (Confederation of UK Coal Producers), COALIMP, (Association of Coal Importers), CoalTrans Conferences Ltd., Golder Associates and the University of Nottingham.

A brief history of EURACOAL from its formation in 1950 to the present day and mention of six of its 25 presidents then followed. Brian indicated that EURACOAL's activities are entirely geared towards the interests of its members. This includes the whole process chain, beginning

with coal extraction, marketing and transport, right through to coal use at power stations, in the steel industry, in other industrial and commercial sectors and by private households. Coal research plays an important role here to optimise processes.

The most important objective of EURACOAL is to highlight, in the interests of its members, the importance of coal's contribution to a secure, competitive and sustainable energy supply for Europe and to attain an acceptable European regulatory framework.

EURACOAL's activities are directed towards continuously informing its members about all coal-relevant EU activities; providing a platform for its members to have discussions and exchanges of opinion; voicing the interests of its members on energy and environment policy issues at European level; creating adequate political and regulatory conditions for the coal industry; exchanging information and maintaining professional working relations with the European Commission and the European Parliament and co-operating with the politically relevant associations and interest groups in order to improve the image of coal.

Brian then showed a slide which indicated the various classes of coal and explained that they were priced according to quality. He was also of the view that many of the general public have little idea how electricity is generated or what is used in its production. The point was then made that global energy supplies are not running out and that coal is still in great abundance. The localities of the major deposits were shown and one striking slide showed the North Antelope Rochelle mine in the USA where there is a coal seam which is 20m thick and accessible from the surface. Brian then explained the vastness and importance of the Powder River Basin coals to the USA and its economy. Other large deposits are known and details were shown of a lignite deposit at Garzweiler in Germany which produced 170 million tonnes of lignite in 2010. Brian felt that there were similar opportunities in the UK with shallow reserves in places such as Northumberland. Only small developments of opencast mining are permitted at this time in the UK and Brian seemed to feel that it was unlikely that anything approaching the scale of extraction seen in the USA and Germany would happen in the UK.

It is known that at present over 40% of the world's electricity is produced from coal and this figure is expected to rise in the future. In the EU the figure for 2009 was 27% although there are wide differences between different countries within the EU. For example, almost half of the electricity generated in Denmark and Germany comes from coal whereas the figure is more than half for Greece, Bulgaria and the Czech Republic and more than 90% for Poland. Non-EU countries also heavily dependent on coal include South Africa, China, Australia, India and even Israel.

The solid fuel mix for the EU is said to be well-balanced with 60% (230Mtce) being indigenous and 40% (152Mtce) being imported hard coal. The indigenous coal is split into 32% brown coal (124Mtce) and 28% hard coal (106Mtce).

Coal mining provides wealth within the EU supplying energy worth annually €27 billion. It directly employs over 250,000 people; a figure which rises to over 1 million with indirect and associated activities. However, despite its obvious importance and value to the EU it has few friends in Brussels and has been the subject of negative comment.

Brian then showed a graph of coal use by China, the USA and the EU from 1970 until 2010. It was clear that EU consumption was falling, that of the USA climbing slowly but that of China was accelerating, particularly after 2000. However, China's latest 5 year plan is attempting to cap energy usage and lower coal use from 66% to 58%. Brian, however, is not convinced that they will be able to reduce their coal usage as planned.

Brian then introduced the idea of logistic distribution of the production rates of coal in the UK, Germany, the USA and China. His slides showed that there was some similarity, particularly in the early years of production, for the rates to follow this curve. If valid, the predicted peak production rates of coal in China of 5 to 6 billion tonnes per year are disturbingly large and

given the lack of significant other energy resources in China and no real opposition to the use of coal, then these production rates may actually be realised.

Brian then compared the export of British coal in 1864 to that of world coal trade in 2010. The pattern of world coal trading is now very different from the 19th century. In total, the world now consumes well over 6,000 million tonnes of hard coal and almost 1,000 million tonnes of lignite or brown coal. Most coal is used close to where it is mined, but around 15% is traded across the oceans.

China, despite its vast resources of coal cannot supply all of its own needs and in 2009 became a net coal importer. The nuclear industry, just about to make resurgence, is now subject to higher scrutiny following the Fukushima reactor problems. The price of natural gas has fallen markedly in the USA whereas coal prices have remained relatively high. Brian feels that coal must continue to set a competitive benchmark price for primary energy. Only with strong competition between fuels for power generation can there be a properly functioning EU market for electricity. Cheap electricity from coal is central to the industrial competitiveness of the EU. He then went on to highlight some of the recent pronouncements from the EU. For example, at their summit meeting on 4th February, EU leaders agreed that, "safe, secure, sustainable and affordable energy ... remains a priority ...". In order to further enhance security of supply, they proposed that "Europe's potential for sustainable extraction and use of ... fossil fuel resources should be assessed". EU leaders also restated their support for the EU's 20-20-20 targets to be achieved by 2020; that is 20% reduction in greenhouse gas emissions (*c.f.* a 1990 baseline); 20% renewables in the primary energy mix; and 20% energy saving (*c.f.* a business-as-usual forecast).

In March this year, DG Climate Action launched its Roadmap for Moving to a Competitive Low-Carbon Economy in 2050. This included some very ambitious CO₂ reduction targets for 2030 and 2050. To achieve an overall 80% CO₂ reduction in 2050, without international offset credits – which are not favoured by the European Commissioner for Climate Action – will require the complete de-carbonisation of the electricity sector. Even by 2030, emissions from the power sector must be cut by a massive 60% or thereabouts. It can be easily shown that replacing coal and oil by gas will not achieve these cuts, however, installing CCS plant to all coal fired and some gas electricity generators could meet the target. A huge change into nuclear and renewables could also hit the target but Brian suggested that this would be very costly and difficult to achieve by 2020.

Brian then addressed how the challenge of mitigating climate change within the EU could be viewed. A 20% reduction in greenhouse gas (GHG) emissions means reducing emissions in the EU-27 from 5.8 billion tonnes per year to some 4.6 billion tonnes per year, over the course of 30 years. The early reductions from the baseline emissions of 1990 were achieved easily by replacing coal by gas and with the collapse of heavy industry in Eastern Europe. The remaining challenge is going to be much harder to realise. From 2020 to 2050, EU emissions must be cut by approximately 120 million tonnes per annum – three-times faster than during the period from 1990 to 2020. And there are no structural changes to make this any easier. Frustratingly, this saving in GHG emissions by the EU will reduce the forecast global emissions by only 7%. The EU, acting alone, can make little difference to the global picture. This is why EURACOAL is so keen to see CCS installed world wide in order to provide the only realistic approach to climate change mitigation.

Energy consumption globally has been growing steadily over the last two decades. CO₂ emissions are rising more steeply than ever before, as more oil, more gas and more coal are used around the world. Between 1990 and 2010, total emissions grew by a massive 46%. In contrast, CO₂ emissions from the EU have been stable over the last two decades and, at 13%, account for a relatively small share of the global total. These figures are relevant to EU policy because the European Commission assumes that the rest of the world will follow its ambitious CO₂ reduction targets. But the evidence is clear: the rest of the world is not following. Emissions are almost 50% higher today than the 1990 baseline year.

Towards the end of 2011, DG Energy will publish its Energy 2050 scenarios. EURACOAL has produced a response to the related public consultation which Brian summarised as follows. Firstly, the vital need for power plant renewal and modernisation. Secondly, the recognition that energy storage is the key to energy security. Electricity storage will become more important as more intermittent renewables are deployed. The cheapest "virtual" store of electricity is a coal stock at a power plant. Thirdly and related to energy storage is the need for power system flexibility. Coal plants can be as flexible as gas-fired plant but with higher efficiencies.

Brian explained that new coal plant will save around one third of the CO₂ of older designs. Improving power plant performance is a task for industry but policy-makers must create the necessary conditions to promote such investments and he feels that EU policy is so anti-coal that only the bravest are prepared to invest in new coal plants.

EURACOAL supports the construction and operation of a series of CCS demonstration plants, as well as the development of a European CCS infrastructure. However, the largest commercial-scale projects are proving difficult to progress. Costs are high and permitting difficulties persist for CO₂ transport and storage. Brian stressed that governments and industry must work together to find solutions that are acceptable to the public at large and allow this important technology to deliver its full potential. EURACOAL's vision for the future is for new investment in more efficient power plants, creating demand for indigenously produced coal, topped up with coal imports from a well-function international market.

Brian summarised his talk with the following key messages :-

Coal and lignite are super abundant comprising 80% of EU fossil fuel reserves. Coal is No.1 today and will remain an important pillar of competitive electricity supplies tomorrow. A balanced energy mix is a winning policy: switching from coal to gas imposes an enormous economic burden with price and supply risks, while lower end-use emissions come at the expense of higher upstream emissions. Continuous investment is needed to modernise power plants across the EU – a "clean coal investment strategy" can reduce emissions by one third from older plants. CO₂ capture & storage is a vital part of the international response to climate change: it is expected to deliver almost 20% of very ambitious CO₂ reductions by 2050. EURACOAL supports the European Commission's efforts to demonstrate a wide range of CCS technologies, including in heavy industry. Governments should guarantee non-discriminatory access to a CO₂ transport infrastructure and ensure sufficient CO₂ storage capacity in the future.

Brian then closed his lecture with profound statements from three well-known figures; from Chairman Mao Zedong "Coal is the food for industry", from President George W. Bush "The world is addicted to oil" and from Brian Ricketts "America is addicted to coal – but don't know it".

Notes of the meeting
"UK Minerals - Engineering Innovation for a Sustainable Future"
Yew Lodge Hotel
Kegworth, Derbyshire
13th October 2011

The Minerals Engineering Society in conjunction with the CRF and the South Midlands Mining & Minerals Institute recently hosted a one-day seminar entitled "UK Minerals – Engineering Innovation for a Sustainable Future".



Seminar audience – Yew Lodge Hotel



MES President Andrew Howells presenting Keynote Speaker Nigel Jackson with his copy of *The History of Coal Preparation in the UK*

The event took place at the Yew Lodge Hotel and delegates began arriving just after 8 o'clock as the full programme of ten presentations was due to start at 9 o'clock. The seminar was opened by a welcoming address from Ian Flanagan and part 1 of Session 1 was chaired by Andrew Howells. The first speaker who gave the keynote address was Nigel Jackson, the Chief Executive of the Minerals Products Association (MPA).

Nigel explained that he was a geologist by training and had worked in industry and operated his own consultancy prior to his present role. The MPA is the trade association for the aggregates, asphalt, cement, concrete, lime, mortar and silica sand industries. MPA members supply around £5 billion of essential materials to the UK economy; by far the largest single supplier of materials to the construction sector.

The MPA builds on and enhances the strong reputation established by its constituent parts for supporting its members to operate in a manner that is economically viable and socially and environmentally responsible. The MPA represents and promotes the mineral products industry in order to secure and maintain the licence to operate for the sustainable supply of essential mineral products; to continue to innovate and deliver sustainable solutions and to maintain existing and to develop new markets.

The MPA has 44 trade associations and 24 product groups and Nigel said that he would not be describing each. He did explain, however, the various different impact levels that the MPA had as follows: - At County Borough Council level - impact low, at Construction Product Association level - impact medium, at Mineral Products Association level - impact high and at Mineral Product Association Product Group level - impact very high.

Nigel also described the MPA Agenda entitled 'Delivering for the Nation...Supporting the Recovery' which has now formally been launched. This identifies the key strategic priorities to enable the industry to support and help deliver Government's economic, environmental and social aims and aspirations. The agenda is summarised as follows :-

1. Economic conditions that support investment - A stable economy is now fundamental, as is a less penal attitude to the industry's tax burden. Only if Government commits to and delivers long-term investment will MPA members, particularly those with international operations, have confidence to spend in the UK;
2. Better Government support for an essential industry - The industry needs more effective Government sponsorship and a co-ordinated approach from its departments based on heightened awareness. Operators will deliver sustainable built environment solutions in return for a more rigorous science-based evaluation of the credentials of competing materials;

3. A reasonable "licence to operate" - The UK can only enjoy the benefits of its mineral products if it has a sound licence to operate. That means an effective, simpler, more consistent and faster planning system based on realistic assessments of future demand;

4. Proportionate legislation and regulation - Proper regulation of industry is important but the mineral products sector is faced with an overwhelming and often conflicting volume. The cumulative burden is massive. New legislation must be fit for purpose and not unfairly "gold plated" when transposed from Brussels to the UK;

5. Recognition of progress - The UK mineral products industry is a world leader in the quality of its operations and best in Europe at recycling and resource efficiency. The industry is also a big contributor to overcoming the challenges of climate change. It needs recognition for its progress and for the essentiality of its products.

Nigel identified seven UK Government departments with which the MPA seeks to engage and make its concerns recognised and addressed. These are the BIS (Department for Business Innovation and Skills) for sponsorship and construction, the Treasury for taxation, DEFRA (Department for Food, Environment and Rural Affairs) for permitting, the DWP (Department for Work and Pensions) for health and safety, DECC (Department of Energy and Climate Change) for emissions and the DCLG (Department for Communities and Local Government) for planning.

In addition, Nigel briefly highlighted the 12 key policy areas that the MPA had identified as being important. These are:- An essential industry; Mineral products and the economy; The aggregates tax; Transport infrastructure; Environmental management; Quarries and local communities; Health and Safety; Transportation of mineral products; Archaeology; Recycling; Coastal quarries and Marine dredging. Further details can be found on the MPA web-site at this link: http://www.mineralproducts.org/iss_key01.htm

Nigel also described a number of practical MPA innovations; for example the Cycle Safe campaign. MPA's high profile launch of its national Cycle Safe campaign took place in London in June 2011, where it supported the Metropolitan Police's 'Exchanging Places' event. Cycle Safe aims to prevent collisions between cyclists and Large Goods Vehicles (LGVs) by raising awareness on both sides of how to cycle and drive safely. MPA's 6 Point Action Plan for Cycle Safe is to: promote driver and industry awareness; promote cyclist and public awareness; improve driver training; encourage members to use appropriate technological adaptations to minimise risks to cyclists and to exchange experiences; liaise with schools and work in partnership.

Another MPA initiative is the "This is Concrete" campaign which is a UK-wide drive focused on showcasing sustainable design and construction and sharing interesting facts and experiences. "This is Concrete" encourages debate and project-based feedback to support sustainability in the built environment.

Lastly, Nigel mentioned the 'Safer by Design' voluntary initiative in which Hanson UK played a key role in pioneering with the MPA. This has received great international recognition and support and is now an official UEPG (European Aggregates Association) project. This initiative further demonstrates MPA's commitment to improving health and safety across the whole supply chain. Safer by Design is a ground-breaking project that will reduce injuries and ill-health attributable to poor mobile plant design. Research has shown that even though meeting international safety standards and the requirements of the EU Machinery Directive, a significant proportion of incidents involving mobile plant on mineral producing and processing sites are due to poor design.

The MPA Biodiversity Strategy was also discussed by Nigel Jackson and its key commitments are as follows :-

1. Extend its knowledge of the wildlife interest and potential on and adjacent to active sites and how best to manage this, and maximise benefits through restoration and after-use, including initiating a comprehensive field study in 2011.
2. Share best practice between its members and partners around the country through regular briefings and a specific working group.
3. Develop its partnerships with conservation organisations, decision makers and individuals to ensure that they are delivering both what people want and wildlife needs. To support this work they will organise a biodiversity exchange in 2011 of all organisations with an interest in improving biodiversity associated with minerals operations.
4. Celebrate its successes through an annual members' award for biodiversity achievement starting in 2011 and sponsored by Natural England.
5. Understand their contribution to delivery of local, national and international biodiversity, including Biodiversity Action Plan targets and future improvement using a range of indicators.
6. Increase their influence through contact with policy makers at all levels, including engagement with European initiatives in association with European Trade bodies.
7. Promote biodiversity education using industry assets such as restored sites and field study and education centres to encourage out of classroom learning and to make the most of first-hand experiences of the natural environment.

Nigel touched on a number of important issues on which the MPA are currently focusing such as how to stimulate growth, taxation, "Localism", mine waste, carbon and energy costs, dewatering and archaeology. Further information can be obtained from the CBI newsletter available at this link :

http://www.cbi.org.uk/media/878409/23DEC284EB676510802577B30053BE38_MG_newsletter%20Final%20vers.%2005.10.10.pdf

Nigel also mentioned the UK Minerals Forum (UKMF) which has the aims of drawing together all key stakeholders, to debate and inform government and the public on the prudent use, sustainable management and supply of UK minerals. To find out more about the UKMF a visit to the following website would be useful [Terms of Reference](#).

The UKMF has a broad membership drawn from industry, regulators, green groups and government. It holds regular meetings and convenes working groups to research and report on critical issues. The UKMF is a key contributor to the CBI Minerals Group 'Living with Minerals' conference series. The following link www.bgs.ac.uk/ukmf describes the UKMF.

Nigel finally brought his whistle stop tour of the UK minerals industry, its successes, its frustrations and its targets for action to an end in front of a very engaged audience. The MPA is a dynamic group lead by a dynamic and forthright Chief Executive both of whom are clearly prepared to fight hard for their industry and what they believed to be right.

The second paper entitled "Potash Mining – Do You Need Us?" was given by Mr Rob McConnell of Cleveland Potash Ltd (CPL). Rob began by explaining that CPL, a business unit of ICL Fertilizers, is a producer and supplier of potash fertilisers for agriculture and industry uses. There was an initial description of what potash was and in this context it was taken to mean potassium chloride (KCl). There is some less precise terminology for other potassium related compound used in agriculture. One definition of potash is as follows: "Any of several compounds containing potassium, especially soluble compounds such as potassium oxide, potassium chloride, and various potassium sulphates, used chiefly in fertilizers".

Historically, the Cleveland potash deposit was first worked in 1939 but the development of the mine was delayed until 1948. In 1961 ICI became involved when a shallower deposit was located near Staithes. The current mine at Boulby extracts potash from depths of 1,100 to 1,350 metres below ground and up to 8 kilometres out to sea. The mine is located in the North Yorkshire Moors National Park between Whitby and Middlesbrough. Due to the sensitivity of its location no tailings pond is allowed but the waste is disposed under very closely controlled conditions below the surface of the North Sea one mile from the shore.

CPL is the largest single employer in East Cleveland and produces 3 million tonnes of potash and 1 million tonnes of salt per year. This amount of potash represents 9% of the world's annual production of around 60 million tonnes. Geologically the deposit is from the Zechstein Sea and a deposit of halite (sodium chloride) is known to exist beneath the potash. First opened in 1968 the mine achieved its full production capacity in 1975.

The raw potash ore consists of about 40 to 50% of soluble salts and 10 to 15% of clay which has to be separated from the valuable salts. Agricultural use accounts for 85% of world production of potash.

Rob then introduced us to the concept of Liebig's Law. This was originally applied to plant or crop growth, where it was found that increasing the amount of plentiful nutrients did not increase plant growth. Only by increasing the amount of the limiting nutrient (the one scarcest in relation to "need") was the growth of a plant or crop improved. This principle can be summed up in the statement that "a plant's growth is limited by the nutrient in shortest supply"

Potassium has the following effects on plant yields: Increases root growth and improves drought resistance; activates many enzyme systems; maintains turgidity; reduces water loss and wilting; aids in photosynthesis and food formation; reduces respiration, preventing energy losses; enhances translocation of sugars and starch; produces grain rich in starch; increases protein content of plants; builds cellulose and helps retard crop diseases.

Rob also mentioning the location of sales by region and indicated that Asia represented the highest user at present. The global use by crops was mostly for cereals, oil palm and rice although it varies from region to region. CPL produces 1 to 1.5% of the global potash of which 40 to 50% is sold in the UK. It is in the form of granules or soluble products. Their export market is to countries such as France, Ireland, Brazil, India and Germany.

Rob concluded his talk by identifying what he saw as the key drivers of industry. They were that the global production of agricultural products has to be increased despite a decrease in the availability of arable land. The medium to long term forecast is that the demand for CPL's products will increase by 3 to 5% annually.

Part 2 of Session 1 was chaired by Mike Gurr and kicked off with a presentation, entitled "London 2012 Olympics – The Green Build". It was given by Ms Rachel Krzeminski who is the Customer Liaison Officer – Major Projects for Aggregate Industries UK Ltd. Rachel began by outlining the content of her talk which included an overview of the Olympic construction; the venue design and construction; the tender process; contract award and KPI's; sustainability in contracting and materials and the lasting legacy. Rachel was seconded to the client from November 2009 to November 2010.

Key players in this project are the London Organising Committee of the Olympic Games and Paralympic Games (LOCOG); the Olympic Delivery Authority (ODA); Olympic Park Legacy Company (OPLC) and the Delivery Partner (CLM) who was the client.

LOCOG is a limited company, owned by the UK Government, that will oversee the planning and development of the 2012 Summer Olympic and Paralympic Games. The Olympic Delivery Authority (ODA) is the public body responsible for developing and building the new venues and infrastructure for the Games and their use after 2012. OPLC is the public sector, not-for-

profit organisation responsible for the long-term planning, development, management and maintenance of the Olympic Park and its facilities after the London 2012 Games. CLM is a consortium made up of Laing O'Rourke, Mace and CH2M HILL. Its role was to manage the programme and costs for the venues and infrastructure. CH2M HILL is based in the Englewood suburb of Denver Colorado, USA, and will be working alongside its British partners: Laing O'Rourke, the UK's biggest construction company; and Mace, the construction management company.

The Olympic construction site was of 500 acre and the costs were £8.9 billion, largely from public funds. It comprised the Olympic Park and the Athletes Village. Construction started in 2006 and was scheduled for handing over in 2011 for Olympic test events. It is 5 miles from the centre of London. There were 13 main contractors employing up to 13,000 workers at its peak.

Aggregate Industries and RM Concrete were both identified as major areas of spend to the ODA in which price was given a weighting of 40% and quality 60%. A "Two Envelope System" procurement approach was used where Envelope #1 contains the technical qualifications, methodology, and schedule, and Envelope #2 contains the proposed level of effort and fee. Envelope #1 for all proposals is opened and each is evaluated on its merits. Only Envelope #2 of the top-rated engineering bid is opened. Envelope #2 from all other firms is returned unopened. The Two Envelope System promotes unbiased selection of the best technical proposal before contract negotiation.

London Concrete was awarded the ready mixed concrete tender and supplied ~380,000m³ of material. Rail transport was the main supply method for aggregate.

ODA had a Sustainable Development Strategy which it sought to deliver through the advancement of the following objectives: carbon, water, waste, materials, biodiversity and ecology, land, water, noise, air, supporting communities, transport and mobility, access, employment and business, health, well-being and inclusion.

The ODA's mission was to 'deliver venues, facilities, infrastructure and transport on time and in a way that maximises the delivery of a sustainable legacy within the available budget'. However, the key drivers for the ODA and CLM could conflict with those of the venue contractors and these issues had to be dealt with.

Tenderers were asked to ensure that they either met or exceeded the following targets: Ensure that as a minimum, construction materials (by value) comprise at least 20% recycled content; Ensure that 25% of aggregate used will be recycled; Transport 50% of materials (by weight) to site by sustainable means i.e. water or rail; and use energy-efficient, low emissions vehicles on-site. For sustainable mix designs raw materials were substituted with secondary or recycled materials such as by-products from coal power stations and steel manufacture or china clay waste and glass sand. Up to 54% by weight of recycled materials were used in mixes.

Materials supplied by Aggregate Industries included: Over 1 million tonnes of aggregate fill materials delivered to the Olympic Park, in addition to the aggregates required for over 400,000m³ of concrete production; over £9 million of asphalt surfacing, including the laying of asphalt products with a high recycled content; 1,500 bespoke precast units supplied to the Velodrome, including terracing and staircases.

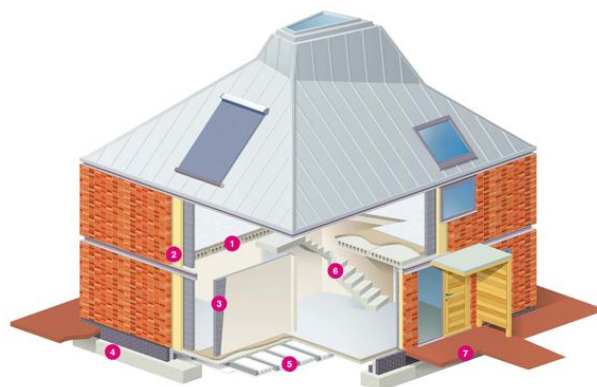
Rachel ended her fascinating talk on how the Olympic venues took shape by highlighting the success of the overall project by its meeting all of its objectives. The project was delivered on time, to cost and to specification. What more can you do!!

Gareth Rouse, from Hanson Ltd., was a late substitute presenter and gave the next paper which was entitled the "Delivering Sustainable Construction Solutions". Gareth gave an introduction to Hanson Ltd. describing their products; aggregates (crushed rock, sand and gravel), ready-mixed and precast concrete, asphalt, cement and cement-related materials, bricks and a range

of building products. Hanson is part of the Heidelberg Cement Group, which has leading global positions in aggregates, cement, concrete and building products. Turnover for the UK business in 2010 was £1.1 billion. Capital investment for the year totalled more than £36 million. Their principal markets are the major conurbations in England and Wales and the central belt of Scotland. They disposed of their aggregates and asphalt businesses in Scotland early in 2010, but continue to operate ready-mixed concrete plants and a cement depot.

Hanson has a commitment to sustainability. To safeguard valuable mineral reserves, they use secondary and recycled materials whenever it is economic and technically feasible. In addition they have programmes in place to reduce energy and water consumption and minimise waste. They provide safe and healthy working conditions for their employees and strive to minimise the impact of their operations on the environment and the communities in which they operate. They have a comprehensive environmental policy in place, underpinned by a commitment to the principles of sustainable development and also report annually on their sustainability performance.

The main part of the talk focused on Hanson's new EcoHouse. It is the first masonry constructed house to achieve Code Level Four under the Code for Sustainable Homes. Constructed at the Building Research Establishment (BRE) the EcoHouse brings together the latest developments in off-site masonry construction, thermal mass and natural ventilation. Designed as a three-bed detached dwelling, the EcoHouse shows all the benefits of off-site fabrication. Together with thermal mass and natural ventilation the EcoHouse represents a building system ideal of the zero carbon houses of the future. It also shows how quickly and easily 'liveable' and saleable properties can be constructed. Constructed using masonry panels manufactured off-site in a controlled factory environment, the build process for the EcoHouse is high quality, high speed and with little or no site wastage. The process is also less susceptible to weather delays compared to on-site construction. Data unveiled by Hanson at this year's Insite 2009 shows that the Hanson EcoHouse has exceeded all performance expectations, proving that the benefits of thermal mass can be provided in a house built from traditional masonry and concrete construction. Results from two years of testing have shown that the combination of effective design, sustainable technology and off-site masonry construction has produced a building system that can help achieve the low carbon homes for the future. The Hanson EcoHouse demonstrates flexible design that's built to last. Their products, systems and sustainable solutions used in the construction of the house can be easily adapted for any development.



The Hanson EcoHouse™

1. [Hanson Hollowcore](#)
2. [Hanson QuickBuild™ walling system](#)
3. [Partition walls \(Hanson aggregate blocks\)](#)
4. [Hanson Concrete foundations](#)
5. [Hanson Jetfloor®](#)
6. [Hanson Precast staircase](#)
7. [Hanson Formpave® Aquaflo SUDS](#)

In terms of investing for the future Gareth described several new projects including one he named Kimberley. This is a contemporary, landmark office complex built with modern methods of construction to high standards, with one ultimate consideration - sustainability. The 6,000m² building comprises primarily impressive open plan office space with additional accommodation, restaurant, gymnasium, crèche and other multi-purpose areas. Unfortunately, it is now unoccupied due to the poor economic climate.

A £50 million state-of-the-art 'soft-mud' brick factory was opened by Hanson in Measham, Leicestershire in 2009. The factory is the largest and most modern production facility of its kind in Europe and has been designed and built with sustainability and quality at its core. Located on a brown field site close to the M42 motorway, it has been developed to combine locally sourced raw materials with highly efficient, low-energy and low-waste production processes, to make the most sustainable bricks of their kind with the lowest embodied CO₂ currently available in the market. In addition to its impressive sustainability credentials, the fully mechanised facility offers bricks of consistent colour, dimensional tolerance and quality, and currently produces more than 20 different varieties of facing bricks in plain reds and buffs as well as multi-coloured options. Gareth closed his presentation by restating Hanson's commitment to green technology, zero carbon products using high recycling of materials and investing in new technologies such as the EcoHouse.

The final paper before lunch was given by Daniel Ashton and was entitled "Sibelco and Our Products". Formerly known as WBB Minerals, Sibelcom is a privately-owned Belgian company which provides advanced industrial minerals to customers throughout the world across a broad range of industries including ceramics, glass, foundry, sports, leisure and paper. A variety of raw materials can be supplied from their reserves of ball clay, kaolin, silica sand, cristobalite, nepheline syenite, olivine and dolomite.

Daniel identified 13 plants owned and operated by Sibelco in the UK. These include Chelford, Congleton and Kings Lynn for the production of silica sand. Clay is extracted from mines in the south west of England. Sibelco UK has a turnover in the UK which comprises 39% into ceramics, 24% into construction and 14% into the glass industry.

Daniel then showed several slides with comprehensive uses and outlets for their products. These included silica sand (used in glass, ceramics, foundry, paint and polymers, water filtration, sports and leisure, electronics, oil and gas), clays (used in tiles, sanitary ware, tableware, construction, refractories, fibreglass, glass wool, foundry, civil engineering), dolomite and calcium carbonate (used in glass, paints, plastics, toothpaste, paper, agriculture), feldspathic materials (used in glass, ceramics, paints and polymers).

A short Q&A session then followed where the all of the morning presenters, with the exception of Nigel Jackson, provided additional information. This was followed by a very enjoyable lunch break!

Session 2 part 1 began at 1.30pm and was chaired by Rod Stace. The first paper was given by Dr Andrew Cave who is the Managing Director of the Smallpeice Trust and was entitled "The Smallpeice Trust – An Introduction". Andrew explained that the Smallpeice Trust (the spelling **is** correct despite what you might think!!) is an independent educational charity that runs hands-on Science, Technology, Engineering and Mathematics (STEM) activities and engineering courses for pupils in Years 6 to 12. They also deliver Teacher Training Days to bring STEM to life in the classroom.

These programmes are carefully planned and implemented by the Trust's experienced educational team working in partnership with leading industry, academic and professional bodies. Their activities not only enable students to learn more about engineering, they also help to develop essential skills like problem solving, creative thinking, teamwork and time

management which will benefit them in the classroom and in their future careers – whatever they go on to do.

Andrew explained that the Trust was created by Dr Cosby Smallpeice - a brilliant, self-taught engineer who invented the Smallpeice Lathe and founded Martonair Ltd. to specialise in pneumatic equipment for the machine tool industry. After the flotation of Martonair, Dr Smallpeice put his energy and £1.6m of his personal fortune to set up The Smallpeice Trust in 1966 to promote his winning philosophy: "Simplicity in design; economy in production."

Today, non-executive trustees and members from engineering, industry, education and other professions govern The Smallpeice Trust as they promote engineering as a career choice for young people through in-school STEM Days, after-school STEM Clubs and residential courses.

By partnering with The Smallpeice Trust, companies can help tackle the skills shortage by giving young people the chance to attend engineering and technology development activities based around a particular industry sector.

The aim of the trust is to promote engineering and technology in all its branches to young people aged 10 to 18. Last year, they ran 37 residential courses for 2,060 students at universities across the country. Another 16,115 students attended their in-school STEM Days.

Many of their company partners, such as E.ON, Babcock, BAE Systems, EDF Energy, Microsoft, National Grid, National Nuclear Laboratory and Southern Water provide funding to enable the trust to run residential courses and STEM Days. Through these partnerships, companies benefit from increased profile amongst the most enthusiastic students. They are able to influence the course content and give their role-model employees the opportunity to develop and lead projects as part of their personal development. Partnering with the trust also contributes towards corporate social responsibility programmes.

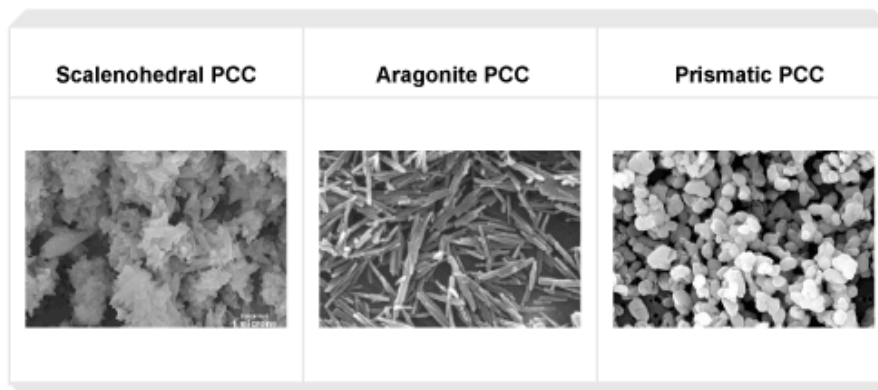
Andrew explained that courses for 2012 would focus on railway engineering, marine technology, nuclear, biomedical, mining and minerals, motorsport engineering, nanotechnology and other engineering topics. He closed his talk by reminding the audience of the aims of the Trust and described the impact that these courses had on the young people attending. He said that 71% were positively influenced to take up a career in engineering and of these 36% were female. The Trust is very clearly doing the right thing in these economically difficult times.

Mike Todd of Specialty Minerals (SMI) then followed with his talk on "Calcium Carbonate, finding the niche market". Specialty Minerals Inc. (SMI), a wholly owned subsidiary of Minerals Technologies Inc., is an international producer of high-performance minerals: talc, precipitated calcium carbonate (PCC), ground calcium carbonate (GCC), lime, and dolomite. The wide variety of applications for their products includes paper, plastics, adhesives, sealants, paint, ink, pharmaceuticals, food fortification, nutritional supplements, speciality ceramics, inks, building products, agriculture, and many others.

Mike compared the types of calcium carbonate that his company produces. The big market for calcium carbonate is for use in paper (61%) while the non-paper market (39%) uses 38% GCC and only 1% PCC. It is this 1% of high value PCC that is the market target of SMI. Whilst GCC can be ground from millimetres to micron sizes, PCC is in the size range from microns to nanometres.

GCC is of low cost and has more effective particle packing but has undefined morphologies, large top sized particles and unalterable purity. However, PCC, despite its higher cost, has unique particle shapes, a narrow size distribution, submicron particle sizes are possible, can be produced in enhanced purity and can build thixotropy.

PCC is made by calcining Derbyshire limestone and hydrating it to produce slaked lime. Carbon dioxide from the calciner flue gas is then used to produce a controlled grade of PCC. Mike then showed photomicrographs of different PCC morphologies.



PCC is most commonly used in paint as an extender for titanium dioxide, or TiO_2 . The small and narrowly distributed PCC particles help space the individual TiO_2 particles and maximise their hiding power. The needle-shaped aragonites and clustered scalenoedral calcites are typical crystal types used as extenders to increase opacity and porosity for dry hiding while smaller prismatics of very uniform particle size can increase film integrity. Such differences in PCC crystal morphology and size can lead to major differences in how a particular PCC performs in different coating formulations.

PCCs are also used for rheology control in sealants, for example as underseal in car chassis. The improved performance using PCC means that a lower weight of sealant can now be used whilst still ensuring adequate and uniform coating thickness. PCC is also used in the pharmaceutical industry where high purity limits and extremely fine and uniform particle sizes are needed.

A product to improve the mechanical properties of biopolymers used in drinks cups, lids and forks known as EMFORCE® BIO ADDITIVE has been developed using PCC. It is specially engineered and of high aspect ratio, designed to provide a unique balance of excellent impact toughness and high flexural modulus (stiffness) for bioplastic-based consumer disposables such as packaging, food and beverage service ware, gift cards, signage, films and bags.

Mike closed his talk by reminding the audience that a simple product like limestone can be used in a large array of higher value new applications and new uses were continuing to be found.

Another late replacement for the planned speaker was Dr Neil Rowson from the University of Birmingham who gave a talk entitled "Mill to Mill – Aggregate Processing". Neil explained that the work that he was about to discuss had been the subject of a sponsored project from DEFRA and the Mineral Industry Research Organisation. The overall project investigated the potential uses for quarry fines generated from aggregate production in the UK. These fines are a by-product of the various processes involved in aggregate production, these can include blasting, primary crushing, secondary and tertiary crushing, plus screening and general materials handling. Quarry fines are considered to be material below 4 mm in particle size. Existing markets for these materials depend on the mineralogy of the deposit, local demand for fines (from the concrete or asphalt industry) and functionality against market competitors. Neil concentrated his talk on the optimisation of the mineral processing through simulation using various mathematical models.

The objectives had been aimed at minimising energy consumption, increasing saleable product percentage and minimising fines generation. Researchers used mineral process simulators such as JKSImMet, Agg-Flow and BRUNO. The use of these simulation packages enable quarry operators and plant designers to experiment with flow sheet configuration and unit process

type (i.e.. compressive versus impact crushers) to minimise fine generation without extensive and expensive plant trials. The correlation between these simulation packages and actual equivalent plant data has proved to be good.

Neil concluded his talk by saying that modelling had produced an income generation model based on the JKSimNet package. Energy saving would be realised by processing the minerals near to the extraction point; using more process control and instrumentation and using on-line size distribution and flow rate measurement.

The final segment of Session 2 was chaired by Professor John Patrick, representing the CRF. John introduced the penultimate paper of the day from Steve Foster who is the Business manager of Singleton Birch. Steve's talk was entitled "Lime for Life, the History, Manufacture and Application of Lime". Singleton Birch has been quarrying Lincolnshire chalk for nearly 200 years. Today they produce up to 400,000 tonnes of lime and over one million tonnes of chalk annually. Their products are supplied to many industries involved with steel, building, chemical and environmental products and they are the UK's largest independent producer of lime.

Steve began by describing some of the early history of lime, for example, its use in the mortar of the Great Wall of China and the pyramids of Giza and also the basic chemical reactions undergone by limestone. Steve explained that the largest users of their limestone were the iron and steel industry (36%), environmental protection (20%), export (19%) and other (25%).

He then went on to itemise the uses within each category as follows :-

Iron and steel: used in iron sinter; used in flux in iron and steel making; aid to slag formation in BOS and electric arc steel making; steel pickling to neutralise waste acids; wire drawing to neutralise and lubricate and in effluent treatment.

Environmental protection: drinking water softener and neutraliser; sewage sludge hygienisation; desulphurisation and flue gas treatment; effluent treatment; contaminated land clean-up and industrial waste treatment.

Other building uses: Lime mortars - restoration and new build; asphalt – anti stripping; soil stabilisation – transport, housing and sports stadia.

Agriculture: soil pH correction; animal pen hygienisation; fish farming and disease control / carcase disposal.

Factory Building Units: Thermalite, Celcon, Durox, Toplite; calcium silicate bricks; plasterboard.

Other industrial uses: Acid neutralisation – titanium dioxide; food and drink – sugar purification; salt purification; hot-can self-heating food; chemicals – pharmaceuticals; toothpaste; adhesives; petrochemical additives – paper; PCC – leather; tanning – fibreglass – minerals; gold and other precious metals.

Having shown the widely diverse application of limestone in the world Steve felt that it was fair to say that lime builds the world we live in!

The last paper of the conference was given by Dr Andrew Bloodworth who is Head of Science – Minerals & Waste at the British Geological Survey. Andrew's paper was entitled "Security of supply: Is the UK's future supply of indigenous minerals secure?" Andrew began his talk by posing the question what is security of supply? It involves criticality – how essential is the mineral? It involves vulnerability – what is the risk of disruption to supply? In the context of 'Cold War' thinking it could be said that overseas supplies are more vulnerable but domestic supplies are less vulnerable. The question at the beginning of the 21st century, however, is how secure is our domestic supply of minerals? Domestic or indigenous minerals are those used in

the energy and construction industry and some are more important than others. Benefits arising from the use of indigenous minerals are: security and self sufficiency; wealth creation and employment (direct and indirect); internalising, environmental and social costs and lower carbon emissions. The disadvantages are the environmental and amenity impacts. A number of factors affect security of supply of indigenous minerals such as geological availability (resources); demand - is there a market; viability – can it be produced profitably; capacity to supply – sufficient extraction sites’ and is the infrastructure able to move it to market; investment – are the risks acceptable enough to allow long-term investment; legal access – can a ‘license-to-operate’ be obtained and can an agreement be reached with land and mineral owners.

Andrew then moved on to resource availability. The UK is relatively rich in resources although they are unevenly distributed and sometimes occur in inconvenient places. There is a large variation in their scarcity/abundance and geological complexity. There are also grade/quality issues and sterilisation by other developments. Finally, landscape, conservation and heritage designations can constrain future availability.

Regarding investment in and access to minerals, legal access is fundamental in creating and maintaining productive capacity. The UK is densely populated and this creates a high demand for resources, however, it also increases competition for land and heightens appreciation and value placed upon landscape, heritage and nature conservation areas.

Andrew then introduced the phenomenon of ‘Nimbyism’ – the politics of land use. A number of factors which promote nimbyism were identified. For example, the population is rising, open space is falling, therefore opposition then rises; society now places a higher value on the environment; the fixed nature of the resources and the population; a report (Saint Index) showed that nimbyism is on the rise against a number of different projects; permitting costs are a significant barrier to entry; risks associated with permitting is a strong influence on industry structure. It now poses serious issues for the Government and the key question is how do we overcome it and gain social acceptance. Suggested ways were to use community grants or make goodwill payments.

Environmental and planning policy is essential for the indigenous mineral industry. Policies at all levels of governance are crucial to long-term security of supply. Spatial planning is key to securing indigenous minerals supply and an integrated approach must be adopted which balances the economic benefits of minerals supply with environmental impacts. Minerals can only be worked where they occur and demand is seldom co-located with supply. The impact of any ‘localism’ agenda needs to be recognised and in the case of primary aggregates there must be a managed supply system.

In order to mitigate security of supply issues Andrew identified a number of options such as the use of a wider and more diverse resource base. This would be challenging but possible, i.e. underground, deeper water, more recycling and substitution. Improvement in resource efficiency (more with less) would be sensible as would an improved supply capacity (transport and storage infrastructure, disposal CCS) and sufficient permitted reserves to sustain supply.

Andrew drew his talk to a conclusion by highlighting the following points: the world is rapidly changing and competition for all resources is growing; a secure supply of indigenous minerals is key to sustaining our economy for the foreseeable future; demographics are the key drivers behind demand, public attitudes, regulatory/permitting environment and competition from other land uses; the need to mitigate and adapt to climate change makes ‘localisation’ more likely.

Andrew then posed a scenario for the year 2040 which he then refined to predict a view of the UK energy minerals futurescape and that for aggregates. The editor felt that it made startling reading.

The future history for 2040 key points are :-

- UK population now 70 million, global population is close to 9 billion: competition for resources intense.
- Binding 2014 Cape Town Treaty carbon reduction targets embedded in UK economy
- Despite this, sea levels rising rapidly.
- BRIC (Brazil, Russia, India, China) Alliance dominates global economy.
- Environmental pressures and economic frailty force Europe and North America to be more self-sufficient.

The 2040 UK energy minerals futurescape key points are :-

- Intense global competition for energy raises prices to 4 times 2010 levels and forces massive increase in energy efficiency.
- Internal combustion engines in private vehicles outlawed in 2030.
- BRIC natural gas export restrictions caused major power shortages in UK in early 2030s.
- UK coal energy extraction and shale gas industry booming as a result of strong demand for secure and reliable zero carbon electricity.
- Sale of pore space in North Sea for carbon storage major revenue earner for England and Scotland governments.

The UK aggregate minerals 2040 futurescape key points are :-

- Intensity of primary aggregate use has fallen by 50% since 2010.
- Remedial Measures Work Plans (RMWP) highlight supply requirements for flood/coastal defence, tidal barrage schemes and high-speed rail.
- Prices high as a result of Celtic export ban, imposition of 500m quarry buffer zones and major sterilisation of marine resources by offshore wind farms.
- Although the controversial Buxton mega-quarry development was permitted in 2020, a number of other major open-pit extensions in the Midlands are refused.
- In 2025, two sites in Midlands and one in Mendips switch to underground working with pipeline link to SE England.
- Despite major public opposition in 2030s, permission granted for aggregate mines at Ware (Herts) and Ebsfleet (Kent).
- Kent mine is Joint Venture with E.ON (void used for compressed air energy store linked to Thames Estuary windfarm).

Andrew brought the technical session to a close with his talk and it provoked a lot of keen discussion for the remaining time available on what had proved to be by general consensus a very interesting seminar.

A final period was allocated for questions to the afternoon speakers and it proved to be a lively and full debate only having to be brought to an end by the chairman as the allocated time had been reached. Each of the presenters was given a copy of the MES book on the history of coal preparation in the UK. It was a full and interesting day which I hope the mineral specialists enjoyed. As a 'non-minerals specialist' I, and I am sure the other CRF attendees, all learned something new!

High Temperature Solid Looping Cycle Network
Vienna, Austria
30th-31st August 2011

Report by Alissa Cotton,
Centre for Energy and Resource Technology, Cranfield University
a.m.cotton@cranfield.ac.uk

The 3rd Meeting of the International Energy Agency Greenhouse Gas (IEA GHG) High Temperature Solid Looping Cycles Network took place from 30-31st August 2011 and was located at the Vienna University of Technology, Austria. Delegates from across the world, including from as far afield as Japan and Canada, attended the highly successful event.

The Meeting's subject matter was focused on the use of the calcium (Ca) looping cycle, and chemical looping combustion (CLC) process, the latter of which was included in the programme for the first time this year. Both processes are considered to have huge potential for the global implementation of carbon capture technology, particularly for reducing emissions from the power and other industries, and therefore it was an excellent opportunity for university and industry researchers alike to share recent findings of their work.

The conference subject matter was specialised, with particular focus on process efficiency and sorbent degradation, and I found it very useful for my research work. The only downside was that calcium looping cycle and CLC presentations were run in parallel so that a decision had to be made on which presentations to attend, although this did give the opportunity for a greater number of talks to be given. A small number of presentations were directed towards the importance of integrating the calcium looping cycle with cement manufacturing plants, as well as a number of talks concentrating on the production of hydrogen via calcium looping from coal syngas.

The presentations given over the two days were of a high quality and were thoroughly interesting, whilst a designated poster session on Day 2 gave the opportunity for researchers to discuss findings in a more informal setting. My poster entitled 'Effect of sorbent particle size on CO₂ capture capacity of the calcium looping cycle' was included in the poster session, and I am also very grateful to the conference organisers for giving me the opportunity to present findings of recent work that my colleagues and I have carried out on the calcium looping cycle, which I presented during the afternoon of Day 2, entitled 'Calcium Looping Cycle Technology Developments at Cranfield University'.

For the first evening of the conference a dinner was held at a typical Austrian restaurant and the entertainment included a guitar and some CLC-related songs! For the second evening, a reception and dinner was held at 'Mount Kahlenberg' which provided fantastic views across the city of Vienna, and an excellent opportunity for networking with other researchers.

The closing session of the conference identified that key issues concerning both technological processes require further research, including the scale-up of the technologies to the pilot and demonstration scale, and also emissions (including trace element) testing to identify any potential effects on the environment.

Overall, the Network Meeting was thoroughly enjoyed by everyone, and special thanks should go to the conference organisers for making it a great success. In addition, thank you to the Coal Research Forum for providing funding and giving me the opportunity to attend the conference and present my work.

Energy-Facts.org

Energy-Facts.org is a project of Dr. Frank Clemente, a member of the Graduate Faculty at Penn State and former Director of the University's Environmental Policy Center. Dr. Clemente served

on the faculty at the University of Kentucky and was a National Institutes of Health Post-Doctoral Fellow in Economic and Industrial Development at the University of Wisconsin. Professor Clemente's research specialization is the socioeconomic impact of energy policy, especially on families, minorities, business and communities. His work has been published in energy related media including *Public Utilities Fortnightly*, *Electrical World*, *Nuclear News*, *World Oil*, *American Coal*, *Oil and Gas Journal*, *Electric Perspectives* and the *Journal of Commerce*. His social science research has appeared in such publications as *Farm Economics*, *Urban Studies*, *Journal of Black Studies*, *Growth and Change* and *Rural Sociology*. Professor Clemente has a doctorate from the University of Tennessee. The following link will take you to the library where a number of interesting energy-related short articles can be found: <http://energy-facts.org/Library/tabid/100/Default.aspx>

STOP PRESS!! STOP PRESS!! STOP PRESS!! STOP PRESS!!

Climate breakthrough as nations sign up to new emissions treaty 13th December 2011, unattributed, London Evening Post

A "political realignment" among the world's nations was hailed by Energy and Climate Change Secretary Chris Huhne as one of the main reasons behind a breakthrough in climate change negotiations. The deal yesterday, which was finally agreed as UN climate talks in Durban, South Africa, overran by almost 36 hours, commits all countries - including major polluters the US and China - to negotiate a legally enforceable treaty on cutting emissions by 2015.

<http://www.thisislondon.co.uk/standard/article-24020697-co-operation-key-to-climate-deal.do>

OTHER ARTICLES FROM THE TECHNICAL PRESS

A cheaper way to clean up coal plant emissions

25th August 2011, Cassandra Profita, OPB News.

A \$2 million grant from the U.S. Department of Energy is going to help the research organization Battelle study a new, cheaper carbon capture method for coal-fired power plants. Speaking of retrofitting coal plants, the Pacific Northwest National Lab (PNNL) operator Battelle just got a \$2 million grant to study a cheaper way to remove carbon dioxide from power plant emissions. PNNL has developed a new carbon capture process that uses organic liquids to pull carbon dioxide out of power plant flue gas. Carbon capture technology already exists, but this process works at a much lower temperature than the one coal-fired plants use now. Scientists estimate it could save more than 50% of the costs of current methods, which rely on an energy-intensive heating and cooling process.

http://news.opb.org/article/a_cheaper_way_to_clean_up_coal_plant_emissions/

Three Studies Confirm Shale Gas Is Not Worse Than Coal

31st August, Geoffrey Styles, The Green Collective.

For most of this year the enormous potential of shale gas has been clouded by controversy over its alleged climate impact. This began with the draft and later the leaked pre-publication version of a paper from a Cornell professor suggesting that the greenhouse gas emissions from gas were no better than those from coal and might even be worse. When I examined Dr. Howarth's analysis in two postings [last December](#) and [this April](#), I found that his methodology and assumptions were sufficiently flawed to undermine his conclusions. However, I also recognized the informal nature of my assessment and suggested the need for further scrutiny of this issue by organizations with more resources. That has now taken place, though I claim no credit for it. Within the last month three separate teams have issued reports bearing on this question, and not one of them validates Dr. Howarth's findings against shale gas.

<http://theenergycollective.com/geoffrey-styles/64258/three-studies-confirm-shale-gas-not-worse-coal>

U.S. Crowned King of Coal, Some Disagree

7th September 2011, William Pentland, Forbes.

The United States boasts over 260 billion short tons of recoverable coal reserves, or roughly 28% of the planet's total coal reserves, according to the U.S. Energy Information Administration. Based on these estimates, the EIA concludes that the U.S. will not exhaust its recoverable coal reserves at current mining levels for 222 years. Not everyone agrees. Take Dave Rutledge, the resident coal reserves genius at the California Institute of Technology in Pasadena, CA. Rutledge is commonly credited for pioneering (or at least popularizing) "peak coal" predictions claiming that coal extraction will peak by 2030.

<http://www.forbes.com/sites/williampentland/2011/09/07/u-s-called-king-of-coal-some-disagree/>

UK joins laser nuclear fusion project

9th September 2011, Jason Palmer, BBC News.

The UK has formally joined forces with a US laser lab in a bid to develop clean energy from nuclear fusion. Unlike fission plants, the process uses lasers to compress atomic nuclei until they join, releasing energy. The National Ignition Facility (Nif) in the US is drawing closer to producing a surplus of energy from the idea. The UK company AWE and the Rutherford Appleton Laboratory have now joined with Nif to help make laser fusion a viable commercial energy source. At a meeting this week sponsored by the Institute of Physics and held at London's Royal Society, a memorandum of understanding was announced between the three facilities.

<http://www.bbc.co.uk/news/science-environment-14842720>

Carbon capture is 'safe' - but how attractive?

13th September 2011, Richard Black, BBC News.

How do you fancy living near a fissure in the Earth that keeps releasing carbon dioxide? It's a question few of us might have considered in the past; but we may have to in future, if the vision of those in the carbon capture and storage (CCS) lobby comes to fruition. According to a paper in Proceedings of the National Academy of Sciences (PNAS) this week, it's not a problem that should keep us awake at night. We've become familiar in recent years with having natural carbon dioxide "seeps" used as "natural laboratories" for exploring ocean acidification, with Italian waters proving the first example. And a different set of Italian CO₂ seeps, on land this time, provides the location for the CCS research. Across the nation, predominantly on the western side, nearly 300 holes and fissures are releasing the gas, a relic of volcanic rocks deep underground. And a group of scientists at the National Institute of Geophysics and Volcanology (INGV) keeps a record of them. Occasionally, the gas causes a death - 19 humans have suffocated this way over the last 50 years, as well as animals from cows to toads. There's nothing on the scale of the Lake Nyos disaster in Cameroon in 1986, when a sudden release of CO₂ from the deep waters killed an estimated 1,700 villagers as they slept. The latest research saw academics at Edinburgh University's CCS unit go through the statistics on seeps and deaths. And they reckon that the odds of being killed by a CO₂ release are pretty acceptable - 10,000 times lower, for example, than your chances of dying in a car accident in Italy, and 1,000 times lower than the risk of being fatally struck by lightning in the US.

<http://www.bbc.co.uk/news/science-environment-14879553>

Coal to natural gas study: The critical detail you might have missed

13th September 2011, Kirsten Korosec, Smartplanet.

A recent study suggests [replacing 50 percent of coal use with natural gas](#) might actually make climate change worse over the short term. It's a stunning conclusion that would appear to debunk the often-touted benefits of natural gas and give renewable energy a considerable boost. But that's hardly the whole story. Unfortunately, in a rush to report the news, much of the media coverage has missed or failed to highlight an important detail. The study, conducted by Tom Wigley with the **National Center for Atmospheric Research**, used computer simulations to project that the amount of methane leakage from gas wells during production — which will increase as natural gas replaces coal-fired power plants — will cause global

temperatures to rise over the next 40 years. Burning less coal would reduce carbon dioxide emissions. However, the computer simulations used in the study focused on the impact of methane leaked from natural gas wells during the production process. To be clear, there's considerable debate about how much methane actually leaks into the atmosphere during unconventional natural gas production. But it's concern because methane is a greenhouse gas emission more powerful than carbon dioxide.

<http://www.smartplanet.com/blog/intelligent-energy/coal-to-natural-gas-study-the-critical-detail-you-might-have-missed/8712>

Solar power cheaper than coal

14th September 2011, Andreas Späth, News 24.

Many critics of renewable energy technologies will tell you that they're a wonderful idea which they'd support whole-heartedly if they weren't so bloody expensive. It might come as somewhat of a surprise then that the day when electricity generated by harnessing the energy of the sun will cost less than electricity produced by burning coal isn't far off at all. The cost of solar power has dropped exponentially for three decades and the trend continues unabated. According to the US Department of Energy's National Renewable Energy Laboratory, the price of photovoltaic (PV) electricity (excluding installation) has plummeted from \$22 per Watt in 1980 to just \$3 today. In Germany, solar PV output has increased by 76% since 2010 while equipment prices have dropped by 50% since 2006. This year alone, the cost of conventional solar panels has fallen by over 20% internationally.

<http://www.news24.com/Columnists/AndreasSpath/Solar-power-cheaper-than-coal-20110914>

Deep oceans can mask global warming for decade-long periods

18th September 2011, David Sosansky, Eurekalert.

The planet's deep oceans at times may absorb enough heat to flatten the rate of global warming for periods of as long as a decade even in the midst of longer-term warming, according to a new analysis led by the National Center for Atmospheric Research (NCAR). The study, based on computer simulations of global climate, points to ocean layers deeper than 1,000 feet (300 meters) as the main location of the "missing heat" during periods such as the past decade when global air temperatures showed little trend. The findings also suggest that several more intervals like this can be expected over the next century, even as the trend toward overall warming continues. "We will see global warming go through hiatus periods in the future," says NCAR's Gerald Meehl, lead author of the study. "However, these periods would likely last only about a decade or so, and warming would then resume. This study illustrates one reason why global temperatures do not simply rise in a straight line." The research, by scientists at NCAR and the Bureau of Meteorology in Australia, will be published online on September 18 in *Nature Climate Change*. Funding for the study came from the National Science Foundation, NCAR's sponsor, and the Department of Energy.

http://www.eurekalert.org/pub_releases/2011-09/ncfa-doc091511.php

University of Victoria research into fibre optic CO2 storage monitoring

18th September 2011, unattributed, Carbon capture Journal

Headed by the University of Victoria's Peter Wild, the three-year project will begin in the lab, then shift outdoors for field tests of the sensor system, first in shallow ground, then in deeper environments. The goal is create a system that could be placed underground near CO2 injection sites or overlying storage formations. Monitoring, measuring and verifying what becomes of injected CO2 over the long term is difficult because of harsh environmental conditions, combined with the deep location and size of the storage sites. Capturing and storing CO2 underground is seen as a viable way of reducing the levels of atmospheric carbon. Although the process is not unproven – for decades oil companies have been injecting CO2 into reservoirs to enhance the recovery of oil – researchers are working on new methods to verify that the compound is securely stored.

<http://www.carboncapturejournal.com/displaynews.php?NewsID=842>

Coal seam gas could 'accelerate' warming

24th September 2011, Nicky Philips and Ben Cubby, Sydney Morning Herald.

Switching from coal-fired power stations to gas could actually speed up climate change over the next few decades, according to new research challenging accepted wisdom about low-emissions fuel. Although burning natural gas generally releases fewer greenhouse emissions than coal, coal also releases sulfates and other particles that cool Earth by blocking some of the sun's light. The study, published in the peer-reviewed journal *Climatic Change Letters*, measured the relative impact of the two fuels and found using more gas would "slightly accelerate" the rate of global warming until at least 2050. "In principle, gas-fired power is more efficient but when you consider the full range of effects of burning coal there are other problems that it creates," the study's author, Tom Wigley, a co-director of the US National Centre for Atmospheric Research and an adjunct professor at the University of Adelaide, said. "Using more gas would reduce carbon dioxide emissions but it would also lead to more methane being released, and that has a much higher global warming potential," he said.

<http://www.smh.com.au/environment/climate-change/coal-seam-gas-could-accelerate-warming-20110923-1kpdf.html>

Coal Accounts for 40% of the Global Electrical Generation

24th September 2011, unattributed, StockMarketReview.com

Many of the world's largest economies, such as the United States and China, base their success on the availability of coal power. However coal is also an extremely dirty fuel and its combustion is one of the main sources of carbon dioxide, responsible for global warming. The future of coal burning for power generation depends on adapting to new environmental restrictions. Coal accounts for over 40% of total global electrical generation -- more than 1,700TWh in 2010 -- and the installed generating capacity in 2010 was around 1,500GW out of a world total of 4,500GW.

<http://www.stockmarketsreview.com/news/166693/>

Green technology could make coal king again

29th September 2011, Terry Kelly, The Shields Gazette.

A South Tyneside academic today argued the case for a cleaner and greener future for King Coal. Professor Paul Younger, from Hebburn, who delivered this year's Lord Lawson Lecture at the University of Sunderland, spoke about the massive untapped potential of coal in the North East. Director of the Newcastle Institute for Research on Sustainability, Professor Younger explained how new technologies are finally making available the rich resources of coal still untapped in the region, where more than 75 per cent of coal deposits still lie untouched beneath our feet. Professor Younger spoke about how coal was "exploited historically, the consequences of the close down of the traditional industry, and the limited prospects of any resumption of conventional mining techniques".

http://www.shieldsgazette.com/news/business/latest-news/green_technology_could_make_coal_king_again_1_3822339

Artificial leaf closer to reality after two new studies

1st October 2011, unattributed, ZME Science.

If harnessed at a much greater potential than it is now, sunlight might not only become the primary source of energy on the planet, but the cheapest too. In one hour the sun sprays our planet with enough energy to power all the electrical needs of the world for an entire YEAR. Now that's something to think about, and luckily scientists around the world have studied this prospect to find a solution, other than the current counter-efficient photo-voltaic cells that power solar panels. This past week alone, two independent studies published almost concomitantly come up as breakthroughs for the ultimate development of cost-effective and productive sun harnessing technology.

<http://www.zmescience.com/research/artificial-leaf-closer-to-reality-after-two-new-studies/>

Chinese CO2 emissions continue to rise despite green efforts

5th October 2011, Andreas Landwehr, m&c news

China is investing heavily in renewable energies, but the rapid growth of its economy is hampering its efforts to shed its role as one of the planet's biggest climate offenders. Global carbon dioxide (CO2) emissions increased by about 5 per cent in 2010 - the highest rate in two decades - following a 1 per cent decline in 2009 due to the global crisis. The increase was partly caused by the strong growth of the Chinese economy. No country contributes more to global warming than China, the world's second-largest economy after the United States, which has doubled its CO2 emissions since 2003. However, China invests more in renewable energy sources than any other country, according to a recent United Nations report, a reality that has impressed environmental groups such as Greenpeace.

http://www.monstersandcritics.com/news/asiapacific/news/article_1666879.php/Chinese-CO2-emissions-continue-to-rise-despite-green-efforts

UKERC awards £2M for topical energy projects

11th October 2011, unattributed, inLoughborough.com

The UK Energy Research Centre (UKERC) has committed over £2M to support new research addressing some of the most important energy developments in the UK and overseas. Six new research projects will cover; the take-up and design of offers under the Government's Green Deal initiative promoting energy efficiency in homes; the impact of UK energy activity on "ecosystem services" provided by natural ecosystems globally and in the UK; a detailed analysis of global gas security and the prospects for global gas governance; scenarios for the development of smart grids and a risk assessment of UK energy policy.

<http://www.inloughborough.com/news/100321/UKERC%20awards%202M%20for%20topical%20energy%20projects>

The true cost of coal and nuclear

12th October 2011, Andreas Späth, news24.

The day when the market price of electricity generated by using renewable energy sources will be on par with that produced by nuclear and coal-fired power plants is closer than you might think. In fact, if all of the behind-the-scenes costs - the expenses not actually included in the price paid by consumers - were factored in, renewable energy would already be cost competitive. In the case of atomic energy, for instance, the financial costs involved when nuclear reactors are shut down are only starting to become clear now. A study released at the end of September suggests that Germany's efforts to decommission its fleet of nuclear plants will come at the expense of at least \$24.5bn and that doesn't even include the cost of long-term nuclear waste disposal. Analysts fear that the final bill may significantly exceed the sum the country's nuclear power industry is legally required to put aside for the purpose.

<http://www.news24.com/Columnists/AndreasSpath/The-true-cost-of-coal-and-nuclear-20111012>

New Study: Non-Recycled Plastics Could Contribute Significant Supply of Alternative Energy to U.S. Economy

12th October 2011, unattributed, PRNewswire

Scientists at Columbia University say energy potential is at least enough to fuel 6 million cars or power 5.2 million homes annually. A new study conducted by the Earth Engineering Center (EEC) of Columbia University and sponsored by the American Chemistry Council has found that if all of the non-recycled plastics that are currently put into landfills each year in the United States were converted to energy using currently available technologies, they could provide at least enough energy to fuel six million cars annually.

<http://www.prnewswire.com/news-releases/new-study-non-recycled-plastics-could-contribute-significant-supply-of-alternative-energy-to-us-economy-131581653.html>

Himalayas: Best place to harness solar power

15th October 2011, unattributed, Zeenews.com

Researchers in Japan claim the Himalayas have a large potential of photovoltaic (PV) electric power generation from sunlight that can supply energy to India and China. They suggest these mountains could be more ideal than hot deserts for locating solar power generators. The research by Kotaro Kawajiri and colleagues at the National Institute of Advanced Industrial Science and Technology in Tsukuba, Japan, appears in the latest issue of American Chemical Society (ACS) journal Environmental Science & Technology. According to the study, installation of crystalline silicon (c-Si) solar arrays in less than four % of the Himalayan region could produce about 3.1 trillion kWh of energy -- that was the total electricity consumption in China in 2007. Contrary to popular notion that hot deserts are the best suited to generate solar energy, the study concludes that some of the world's coldest landscapes - including the Himalaya mountains, the Andes and even Antarctica -- are ideal locations for solar arrays.

http://zeenews.india.com/news/eco-news/himalayas-best-place-to-harness-solar-power_736731.html

Germany Sets Aside \$130 Billion for Renewable Energy

19th October 2011, John Daly, Oil Price.com

German Chancellor Angela Merkel announced on 30 May that Germany, the world's fourth-largest economy and Europe's biggest, would shut all of its 17 nuclear power plants between 2015 and 2022, an extraordinary commitment, given that they currently produce about 28 percent of the country's electricity. Underlining the government's seriousness in changing the country's energy matrix, Germany's Kreditanstalt für Wiederaufbau (German Development Bank) is to underwrite renewable energy and energy efficiency investments in Germany with \$137.3 billion over the next five years, Germany Trade and Invest reported. Overall, the German government's 6th Energy Research Program has made an extraordinary \$274.6 billion available for joint funding initiatives in energy storage research over the next three years.

[http://oilprice.com/Alternative-Energy/Renewable-Energy/Germany-Sets-Aside-\\$130-Billion-for-Renewable-Energy.html](http://oilprice.com/Alternative-Energy/Renewable-Energy/Germany-Sets-Aside-$130-Billion-for-Renewable-Energy.html)

Government "farce" after Longannet CCS shut down

19th October 2011, unattributed, ClickGreen

Just hours after Prime Minister David Cameron told MPs that government cash was ready to support carbon capture and storage projects, the energy department has pulled the plug on the Longannet CCS scheme. In a short statement issued by the Department for Energy and Climate Change (DECC) this afternoon, the decision to finish with the Longannet project was confirmed. It came less than three hours after David Cameron told the House of Commons in response to a question over the future of Longannet: "The funding we set aside for carbon capture and storage is still there and will be made available". "Clearly the Longannet scheme isn't working as they intended but the money from the government and support from the government for this vital technology is still there." However, the DECC statement issued shortly later, said: "A decision has been made not to proceed with Longannet but to pursue other projects with the £1 billion pounds funding made available by the Government. "The decision balances the UK's [low carbon](#) ambition with the need to ensure taxpayer's money is invested in the most effective way. £1bn will be available for a new process and we are expecting a number of promising bids from both Scotland and England."

<http://www.clickgreen.org.uk/news/national-news/122676-government-%5Cfarce%5C-after-longannet-ccs-project-is-shut-down.html>

Mozambique to become significant coking coal producer

21st October 2011, unattributed, Mining Review .Com

Mozambique is poised to become a significant coking coal producer within the next three to five years, with its emerging coal sector accounting for more than 60% of the total value of the project pipeline. Making this statement here, Frost & Sullivan research associate Christy Tawii said the total value of mining projects across seven commodities in Mozambique amounted to

US\$11.6 billion, of which the coal sector accounted for US\$7.1-billion. The coal industry, which is expected to produce 20Mtpa by 2015, currently comprises 12 projects in a feasibility stage, one in a bankable feasibility study stage and five projects that are under construction, she added.
<http://www.miningreview.com/node/20097>

Innovative ways to reduce CO2 emissions from the cement industry **24th October 2011, unattributed, Recyclingportal.eu**

The burning of fuels such as petroleum coke or coal in the calcination process that turns limestone into clinker, causes emissions of CO2 to the atmosphere. Almost twice as much CO2 is actually produced by the calcination reaction itself. Since the basic chemistry cannot be changed, the industry has had to find other ways to reduce the CO2 output. Nevertheless, emerging innovative products like the carbon negative cement Novacem, based on magnesium silicate, might reduce the energy consumption during the manufacturing process and push innovation in the 'green' low-carbon segment of the building materials sector.
<http://www.recyclingportal.eu/artikel/27510.shtml>

Multiple world-firsts with Linc Energy's fifth UCG gasifier **25th October 2011, Isaac Leung, PACE Today**

LINC Energy has started up its fifth underground coal gasifier at its research and development facility in Chinchilla, Queensland. According to Linc Energy, Gasifier 5 is the most technologically advanced Underground Coal Gasification (UCG) gasifier in operation in the world today. It is the final phase for the company's technology trials, with commercial implementation being the next step. Gasifier 5 is designed to support the commercial roll out of Linc Energy's Enhanced Oil Recovery (EOR), Gas to Liquids (GTL) and Clean Gas energy applications. It is the first multi panel UCG gasifier operation in the western world, operating in tandem with the Gasifier 4 UCG panel. It was producing gas within 60 minutes of ignition, the fastest commissioning of any UCG operation in the world.
<http://www.pacetoday.com.au/news/multiple-world-firsts-with-linc-energys-fifth-ucg>

Coal ideas: the revival of Hungary's mining industry – or not? **27th October 2011, Patricia Fischer, Budapest Business Journal**

Hungary's new energy strategy puts emphasis on the role of coal in its energy mix, but the sector faces several challenges, including regulatory and environmental issues. There is some revitalization in the industry, but the future of coal mining lies in clean coal technology. Coal mining was once a booming industry in Hungary, ensuring the livelihood of many, mostly in underdeveloped areas. But after the collapse of communism, all that changed: mines were privatized and soon after, many closed down due to their uneconomical operation and the then lower prices of other energy sources, Ákos Zoltay, general secretary of the Hungarian Mining Association told the *Budapest Business Journal*. There were eight coal mine companies in Hungary in 1990, but only a few are left in operation. Twenty years ago, the mining industry employed 81,000 people (of which 52,000 worked in coal mines; today, the few existing mines give jobs to about 2,000 people only, and the number of employees in the entire industry has dropped to 22,500.
http://www.bbj.hu/business/coal-ideas-the-revival-of-hungarys-mining-industry-%E2%80%93-or-not_60892

The challenges of shale gas **31st October 2011, unattributed, Financial Post**

The development of the extraction of gas is a potential game-changer in world energy markets, offering ample supplies in markets that could otherwise tighten in coming years. In the United States, hydraulic fracturing, a recently developed method of shale gas procurement, has the potential to flip the country from a net importer of natural gas to a net exporter. Shale gas now accounts for one quarter of all U.S. gas production, and the Energy Information Administration (EIA) forecasts that this proportion will double by 2035. In Europe, according to a study by IHS Cambridge Energy Research Associates, production levels from unconventional

gas sources including shale could range from 60 billion cubic metres (bcm), less than half of current shale gas production in North America, to 200 bcm by 2025. More details go to.....

<http://business.financialpost.com/2011/10/31/the-challenges-of-shale-gas/>

Ministers Approve 108 MW Waste to Energy Facility

31st October 2011, unattributed, Waste Management World

A new 108 MW multi-fuel waste to energy facility has been given the go-ahead in Yorkshire as part of the redevelopment of an existing coal fired power station. According to SSE Generation, the wholly owned generation business of SSE (Scottish and Southern Energy), it has received consent from the Department of Energy and Climate Change (DECC) to develop the waste to energy facility within the existing Ferrybridge site. The company says that the facility will use a range of sustainable fuel sources to generate electricity and heat, including is non-hazardous waste wood, processed commercial and industrial waste and along with treated municipal waste, where the recyclable material has been removed, and the material has been stabilised by drying it.

http://www.waste-management-world.com/index/display/article-display/4012699199/articles/waste-management-world/waste-to-energy/2011/10/Ministers_Approve_108_MW_Waste_to_Energy_Facility_.html

What is thorium and how does it generate power?

1st November 2011, Duncan Clarke, The Guardian

Thorium is a radioactive chemical element that could in theory be used to generate large quantities of low-carbon electricity in future decades. Compared to the uranium that powers today's nuclear plants, thorium is more abundant and widely distributed in the Earth's crust. It also offers various safety benefits over uranium: it's not prone to runaway chain reactions that can lead to nuclear disasters; its waste products remains dangerous for a much shorter period; and its byproducts aren't useful for making nuclear weapons. In addition, thorium reactors could theoretically be used to burn up the dangerous plutonium stored in existing nuclear waste stockpiles. For more see.....

<http://www.guardian.co.uk/environment/2011/nov/01/what-is-thorium-nuclear-power>

Australia passes carbon tax in 'history-making' vote

8th November 2011, unattributed, Platts

The Australian Senate Tuesday passed the government's legislation to introduce a price on carbon in what was described by Prime Minister Julia Gillard as a "history-making vote" which "turns years of discussion into a reality." Under the legislation, Australia will become the first OECD country to implement a flat tax on carbon emissions, when it introduces a levy of A\$23 (\$23.81)/mt from July 1, 2012. The carbon tax will rise by 2.5% a year in real terms until July 1, 2015, when the mechanism will transition to an emissions trading scheme under which the price will be determined by the market. For more see....

<http://www.platts.com/RSSFeedDetailedNews/RSSFeed/NaturalGas/8555088>

Fusion energy still has a way to go

8th November 2011, Till Mundzeck, Independent Online

Twenty years after the world's first controlled release of nuclear fusion power took place, research is continuing into unlocking its potential as a safe and clean energy source for future generations. "Fusion has all the advantages of nuclear power, but very few of the disadvantages," says Remmelt Haange, deputy director general of the International Thermonuclear Experimental Reactor (ITER) research and development project. However, fusion energy is not expected to be commercially available before 2050, when it would be competing with a strong showing from renewable energies. The sun is a natural reactor for fusion power, a virtually limitless energy source. There is still no commercial fusion energy production plant in operation, but research is continuing into this technology, which can release huge quantities of energy by joining elements with a low atomic number (with a low number of protons in the nucleus of their atoms). For more see....

<http://www.iol.co.za/scitech/science/environment/fusion-energy-still-has-a-way-to-go-1.1173867>

Prevention and Control Module for Spontaneous Combustion of Coal at Coal Yards

8th November 2011, S.Deepak Kumar, EnergyPulse

Spontaneous combustion of coal is a common concern within the coal stockyard of thermal power plants due to the direct effect that energy losses have on financial performance. As coal is the primary fuel for a thermal power plant, adequate emphasis needs to be given for its proper handling and storage. It's also essential because of related safety and environmental implications of spontaneous combustion of coal. The problem is a natural phenomenon that is aggravated by improper management of coal. A lot of research has been done on spontaneous combustion of coal but still there is a lack of a comprehensive approach which can be applied to deal with the problem. For more see...

http://www.energypulse.net/centers/article/article_display.cfm?a_id=2484

Nuclear energy 'vital' to face energy demand: IEA

9th November, unattributed, AFP

Nuclear energy remains vital to cope with rising energy demand, mainly in emerging economies, fight global warming and avert increased damage to the environment, the IEA warned on Wednesday. The IEA also warned that global nuclear generation capacity could fall by 15.0 percent by 2035 if countries such as Germany and Belgium pressed ahead with cutting their nuclear output in the light of the nuclear accident at Fukushima in Japan in April. A pullback from nuclear production, amid a rise in demand for energy, was likely to drive countries towards increased use of coal and gas, and therefore to generating extra carbon pollution with a devastating effect on the environment. The energy independence of nuclear-power producing countries would also be in danger because their sources of supply would be reduced, the International Energy Agency said. And the price of non-nuclear sources of energy would rise sharply, the IEA said, forecasting that in any case global oil demand was set to grow by 14.0 percent by 2035, pulled by China and emerging economies. For more see.....

<http://www.google.com/hostednews/afp/article/ALeqM5holylcT42wPXxJpit0c8iPOgekCO?docId=CNG.17f71c5ac66e9cc446a1d9618ee79aa8.d1>

IEA Warns Governments to Take Action Against Global Warming

10th November 2011, James Herron, Wall Street Journal

Dangerous climate change will be essentially irreversible within a little over five years, the International Energy Agency said in an annual report urging governments to do what they can to prevent this outcome. To prevent long-term average global temperatures rising more than two degrees Celsius (3.6 degrees Fahrenheit) above preindustrial levels—seen as the maximum possible increase without serious climate disruption—immediate, drastic changes to energy and industrial policies are needed, the IEA said in its World Energy Outlook. For more see....

http://online.wsj.com/article/SB10001424052970204358004577027542955102790.html?mod=googlenews_wsj

Global Energy Storage Capacity to Multiply 100-Fold by 2021

11th November 2011, unattributed MarketWatch

Although energy storage solutions such as compressed air and pumped storage have been around for decades, they have not had significant success in the global market when compared to the substantial increase in grid capacity over the past 50 years. Now, however, energy storage on the grid is reaching a turning point. Numerous new technologies -- and variations on "old" technologies, such as compressed air and pumped hydro storage -- are being demonstrated in countries around the world. To meet the growing opportunity, utilities, grid service providers, and equipment suppliers are all intensifying their efforts in the energy storage arena. According to a recent report from Pike Research, total energy storage capacity worldwide will increase

from 121 megawatts (MW) in 2011 to 12,353 MW in 2021 -- multiplying 100-fold over a 10-year period. For more see...

<http://www.marketwatch.com/story/global-energy-storage-capacity-to-multiply-100-fold-by-2021-forecasts-pike-research-2011-11-11>

Carbon tax 'puts 6,000 UK mining jobs at risk'

14th November 2011, Simon Goodley, The Guardian

George Osborne is putting 6,000 coal mining jobs at risk, despite new technology potentially transforming the fuel into a clean source of energy, a new paper by a right-wing thinktank says. The report, called The Atomic Clock, due to be published by the Centre for Policy Studies next month, examines the impact of Osborne's plans to increase the cost of burning fossil fuels with the introduction of a carbon floor price. It says the proposals will make the remnants of the British coal industry uneconomic and force the energy industry to import foreign coal – even if efforts to develop carbon capture and storage systems prove successful. For more see...

<http://www.guardian.co.uk/business/2011/nov/14/carbon-tax-uk-jobs-risk>

Solar Markets: A Study in Extremes

16th November 2011, Elisa Wood, Renewable Energy World.Com

The world is using more and more solar energy; of that there is no doubt. But solar comes in many sizes and shapes. Which will prevail in the coming five or 10 years? This is a legitimate question because today's solar industry is a study in extremes. Massive concentrating solar plants give deserts a futuristic feel and promise thousands of megawatts to power cities. At the same time, tiny photovoltaic cells installed in clothing provide just enough energy for a person's mobile phone. And, despite the dazzle of these technologies, old-fashioned rooftop solar continues to be the industry mainstay. With its ability to produce useful energy on both a small and large scale, solar holds an enviable position in the renewable energy market. We can't walk around holding windmills to charge our iPods, nor do we build biomass plants in our backyards to warm our swimming pools. Solar, on the other hand, permeates our electricity system from gadget through grid-scale. For more see...

<http://www.renewableenergyworld.com/rea/news/article/2011/11/solar-markets-a-study-in-extremes>

Rare-earth shortage to hamper clean energy: EU study

17th November 2011, unattributed, EurActiv.com

Looming shortages of metals that are in high demand and dominated by a single supplier – China – threaten Europe's goals for cleaner transport and sustainable energy, says a new study prepared for the European Commission. The study by the [Joint Research Centre](#) says supply shortfalls of component metals in the next two decades risk the production of solar, wind and nuclear technologies as well as electric vehicles and carbon-capture systems. "This adds more evidence to the fact that Europe has to look within itself ... and more toward waste management, to re-use existing metals," said Dr. Raymond Moss, lead author of the report. For more see...

<http://www.euractiv.com/sustainability/rare-earth-shortage-hamper-clean-energy-eu-study-news-508967>

Google Pulls Plug On Renewable Energy Research

23rd November 2011, Eric Doyle, eWEEK Europe UK

Among other cuts, Google has scrapped the RE>C project but has posted its results for others to use. Google is cutting back on its projects and has announced a major casualty will be its Renewable Energy Cheaper Than Coal (RE>C) initiative. Google CEO Larry Page is taking the late Steve Jobs' advice to avoid "becoming a Microsoft" by cutting the breadth of its project work and concentrating on doing fewer things well. The RE>C project is somewhat extra curricular to Google's core business.

<http://www.eweekurope.co.uk/news/google-pulls-plug-on-renewable-energy-research-47013>

Carbon emissions divide 'can be bridged'

23rd November, Richard Black, BBC News

The gap between where greenhouse gas emissions are headed and where they need to be for climate targets can be bridged cheaply, says a UN report. It says that if sectors such as energy, farming, forestry and transport all cut emissions by feasible amounts, global warming can be kept below 2C. But countries' current pledges are not enough to meet the 2C target. The report, [Bridging the Emissions Gap](#), comes shortly before this year's UN climate summit opens in South Africa.

<http://www.bbc.co.uk/news/science-environment-15834103>

Biomass could provide a fifth of global energy without damaging food production

25th November 2011, Simon Levy, Imperial College London

Energy generated from plant biomass could deliver up to one fifth of global demand without causing a decline in food production, although there are challenges involved, according to a new report launched this week by the UK Energy Research Centre (UKERC). The report, [Energy from biomass: The size of the global resource](#), examines the share that biomass might contribute to the future global energy system and is the first systematic review of the evidence base. Scientists working in Imperial's Centre for Environmental Policy (CEP) carried out the research to understand why there are a large range of estimates and how this affects the wider debate about bioenergy.

http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/newssummary/news_25-11-2011-11-24-10

Making energy from sewage

25th November 2011, Alex Wright The Royal Gazette On-line

A technology that converts sewage into energy in the form of methane could be rolled out across Bermuda in the next few years if tests prove to be successful. The Biogas Energy Systems (BGE) is planned to be used in a feasibility study carried out by alternative energy company Dragonfly Resource Recovery Inc at the Grotto Bay Beach Resort. If the technology works in Bermuda then the company could launch it throughout a number of residential, commercial and municipal applications on the Island. Dragonfly's aim is to implement and commission several systems, starting with a suitable test site on the Island.

<http://www.royalgazette.com/article/20111125/BUSINESS/711159884>

Carbon-busting micro-tubes could convert cities into huge CO2 traps

30th November 2011, unattributed, Click Green

Land unsuitable for tree planting could still be used to reduce levels of carbon dioxide in the atmosphere thanks to new research. Microscopic tubes that suck in carbon dioxide from the air are being developed by chemists, engineers and medical researchers at the University of Edinburgh, with funding from the RCUK Energy Programme, led by the Engineering and Physical Sciences Research Council (EPSRC). Just one 1m² unit containing the tiny tubes could adsorb the same amount of carbon as 10 average trees. Read more at.....

<http://www.clickgreen.org.uk/research/data/122860-carbon-busting-micro-tubes-could-convert-cities-into-huge-co2-traps.html>

UK carbon-cutting targets exceeded, government research claims

1st December 2011, Fiona Harvey, The Guardian

The UK is set to substantially over-achieve on its carbon-cutting targets, with potential economic benefits in cost savings and the growth of new industries, according to a government report. Since 1990, the UK's carbon emissions have dropped by a quarter, but the report made clear that the carbon cuts of the past two decades were much easier to achieve than those needed in the next 20 years. These will require investments of hundreds of billions of pounds and the transformation of the UK's energy, transport and industrial sectors. For more see...

<http://www.guardian.co.uk/environment/2011/dec/01/uk-carbon-cutting-targets-research?newsfeed=true>

EU seeks billions for energy research

2nd December 2011, unattributed, UPI.com

The European Commission said this week that it's seeking \$42.6 billion for scientific research on "secure, clean and efficient energy" and other societal needs. The proposal is part of the EU leadership's "Horizon 2020" plan, which would run 2014-20, released Wednesday in Brussels by European Commissioner for Research, Innovation and Science Maire Geoghegan-Quinn. The sum is part of a \$108 billion science research and development budget that represents an increase and renewed commitment to EU-funded scientific spending at a time of financial turmoil in the eurozone. For more see...

http://www.upi.com/Business_News/Energy-Resources/2011/12/02/EU-seeks-billions-for-energy-research/UPI-48171322825220/?spt=hs&or=er

New Device To Convert Heat To Electricity In Development At MIT

3rd December 2011, unattributed, RedOrbit

Researchers at MIT say that they have discovered a way to generate electricity from the sun's light that uses solid-state devices, but does not require mirrors to focus the sunlight, meaning that they could be simpler and less expensive to make than similar, traditional devices. According to an online article by David L. Chandler, of the MIT News Office, the discovery is essentially an enhancement of devices known as thermophotovoltaics, a less common way to take advantage of the sun's heat. The researchers, including MIT Research Laboratory of Electronics research scientist Peter Bermel, developed a system in which a photonic crystal to prevent heat from escaping from the thermoelectric material used in the device. For more see...

<http://www.redorbit.com/news/science/1112433571/new-device-to-convert-heat-to-electricity-in-development-at-mit/index.html>

UN climate talks face challenges

4th December 2011, Richard Black, BBC News

As ministers begin arriving at the UN climate talks in South Africa, new science is showing the challenges they face in trying to curb global warming. Using a new methodology, a Swiss team has calculated that about three-quarters of the warming seen since 1950 is down to human influences. A second report says glacier loss in parts of the Himalayas is accelerating. And an international research group has confirmed that emissions have soared despite the global financial crisis. For more see...

<http://www.bbc.co.uk/news/science-environment-16022585>

The Damage Done, Part 1 — Is Green Energy Really Better for the Environment?

6th December 2011, Al Bredenberg, ThomasNet News

How do you measure the harm done to the environment by the production and consumption of electricity? How do you know which kind of energy does more harm? Is it really so that "green" energy — solar, wind, hydro — is better for the environment than conventional energy — coal, gas, nuclear? Isn't it true, for example, that the manufacture of photovoltaic (PV) solar panels causes pollution, and that their disposal at end-of-life releases toxic materials into the environment? So how do you know that solar is really any more "green" than coal? For much more visit.....

http://news.thomasnet.com/green_clean/2011/12/06/the-damage-done-part-1-is-green-energy-really-better-for-the-environment/

Global Carbon Emissions Reach Record 10 Billion Tons, Threatening 2 Degree Target

6th December 2011, unattributed, Science daily

Global carbon dioxide emissions from burning fossil fuels have increased by 49 per cent in the last two decades, according to the latest figures by an international team, including researchers at the Tyndall Centre for Climate Change Research, University of East Anglia. Published Dec. 4 in the journal *Nature Climate Change*, the new analysis by the Global Carbon Project shows fossil fuel emissions increased by 5.9 per cent in 2010 and by 49 per cent since 1990 -- the reference year for the Kyoto protocol.

<http://www.sciencedaily.com/releases/2011/12/111204144648.htm>

Demand for coal has been growing faster than any other energy source

6th December 2011, Krishna Kumar, Machinist.In

John Topper, Managing Director, International Energy Agency - Clean Coal Centre (IEA-CCC), UK, said that demand for coal has been growing faster than any other energy source and is projected to account for more than one-third of the incremental increase in global energy demand. "Work is being undertaken in India, EU, Japan, USA, and China to develop ultra supercritical boilers and advanced ultra supercritical boilers system to increase the efficiency of generation and reduce CO2 emissions. In India, an ambitious date has been set for operation of an 800 MW demonstration plant," Dr Topper said. He said that Integrated Gasification Combined Cycle (IGCC) plants are already in operation all over the world and about 5 of them have overcome their initial technical problems and established the plant reliability and availability on par with other established power generation technologies. He was speaking at a workshop on "Supply & Demand of Coal and Power Plant Technology Evolution", organised at BHEL Tiruchi.

http://machinist.in/index.php?option=com_content&task=view&id=4046&Itemid=2

Research claims nuclear power could help to reduce emissions

8th December 2011, unattributed, The Engineer

A report by Manchester University claims nuclear power could contribute significantly to reducing greenhouse-gas emissions in the UK but not without consequences. The research into the sustainability of nuclear and other electricity options in the UK shows that nuclear power could make a significant contribution to reducing greenhouse-gas emissions by 2035. However, the report suggests that would require a huge expansion of nuclear, constituting 35 per cent of the electricity mix by 2035, almost double the current contribution. Given that most current nuclear power stations are due to close in this period, this scenario seems unfeasible, the authors claim. For more see...

<http://www.theengineer.co.uk/sectors/energy-and-environment/news/research-claims-nuclear-power-could-help-to-reduce-emissions/1011168.article>

Scottish Renewables slams 'flawed' energy report

12th December 2011, unattributed, BBC News Scotland

The renewables industry in Scotland has hit back at a report which claims wind and solar power cannot meet the UK energy's needs. Scottish Renewable said the research from the Adam Smith Institute was "flawed" and "one-sided". The pro-free market think tank produced its report jointly with the Scientific Alliance. A separate study by Reform Scotland said the country could earn £2bn a year exporting renewable electricity. The more pessimistic assessment of the potential for green energy came in Renewable Energy: Vision or Mirage? For more see...

<http://www.bbc.co.uk/news/uk-scotland-16131200>

Insight: Shale gas emissions similar to conventional gas

12th December 2011, unattributed, environmental researchweb

Several recent studies suggest that the greenhouse gas impacts of shale gas are not substantially different from those of conventional gas. Nathan Hultman and colleagues, writing in [Environmental Research Letters \(ERL\)](#), examine how shale gas compares to conventional gas

and coal when used for electricity generation. The researchers estimate that the extraction processes for shale gas do have a small but relatively important impact on the overall lifecycle of greenhouse gas emissions.

<http://environmentalresearchweb.org/cws/article/news/48054>

The Damage Done, Part 2 — How Do You Measure the Environmental Effects of Energy?

13th December 2011, Al Bredenberg, ThomasNet News

How do we know that “green energy” is really “greener” than energy of any other color? Go around bragging long enough about your Prius or your rooftop solar panels or your support for green jobs, and eventually somebody’s going to throw it up in your face that “green energy” pollutes just as much as any other kind. I know, it’s offensive, and we understand your righteous indignation. But how do you know for sure? Is it possible that you’re just fooling yourself, and no matter what you do, you’re leaving toxic waste and a massive carbon footprint everywhere you go? On the other hand, maybe you’re right and your anti-green critics are full of radioactive, coal-fired hot air. Even so, how do you prove it? For more visit.....

http://news.thomasnet.com/green_clean/2011/12/13/the-damage-done-part-2-how-do-you-measure-the-environmental-effects-of-energy/

Update 1 -Coal outlook uncertain, China remains driver - IEA

13th December 2011, unattributed, Reuters Africa

The forecast for coal to 2016 is marked by extreme uncertainty over the global economic outlook and the impact of shifts in China's domestic market, the International Energy Agency said on Tuesday. Coal demand worldwide will keep growing in the medium term, despite calls in many countries for reducing reliance on high-carbon fuels, the IEA said in its Coal Medium-Term Market Report 2011 released on Tuesday. For more see....

<http://af.reuters.com/article/southAfricaNews/idAFL6E7ND4YS20111213>

The Damage Done, Part 3 — Is Coal Really So Bad for the Environment?

17th December 2011, Al Bredenberg, ThomasNet News

The world is producing and consuming about 8 billion tons of coal every year, generating more than 150 quintillion Btus (British thermal units) (Source: [International Energy Administration, IEA](#)). According to the green-energy narrative, the use of coal for generating electricity is destroying the land, polluting the natural world, raising world temperatures to dangerous levels, and spilling toxic fly ash into the environment. For more see....

http://news.thomasnet.com/green_clean/2011/12/20/the-damage-done-part-3-is-coal-really-so-bad-for-the-environment/

New study warns of dangers of using hydrogen as an energy carrier

18th December, unattributed, ClickGreen

Using hydrogen as an energy carrier can help reduce air pollution and greenhouse gas (GHG) emissions associated with fossil fuels, according to recent research. However, if used on a large-scale, it is important that hydrogen does not leak significantly into the atmosphere as it might have some negative environmental effects, such as increasing the lifetime of methane, increasing climate effects and causing some depletion of the ozone layer. The precise impact of extensive hydrogen use on the chemistry of the atmosphere is uncertain. For more see...

<http://www.clickgreen.org.uk/research/trends/122970-new-study-warns-of-dangers-of-using-hydrogen-as-an-energy-carrier.html>

Study: Corporate environmental reports full of omissions, errors

18th December 2011, Zafrir Rinat, Haaretz.com

Companies worldwide are submitting environmental reports that are either factually inaccurate or mistaken, according to a new European study. The study pointed out a series of embarrassing mistakes in reporting. For example, two years ago the Italian energy company

Enel took responsibility for the emission of 122 million tons of carbon, which was four times the annual carbon footprint of the whole planet at the time. Ford Motors, meanwhile, reported more mineral waste in North America than that produced by the entire world. For more see...
<http://www.haaretz.com/print-edition/news/study-corporate-environmental-reports-full-of-omissions-errors-1.402030>

Upper atmosphere facilitates changes that let mercury enter food chain 18th December 2011, Vince Stricherz, EurekAlert

Humans pump thousands of tons of vapour from the metallic element mercury into the atmosphere each year, and it can remain suspended for long periods before being changed into a form that is easily removed from the atmosphere. New research shows that the upper troposphere and lower stratosphere work to transform elemental mercury into oxidized mercury, which can easily be deposited into aquatic ecosystems and ultimately enter the food chain. "The upper atmosphere is acting as a chemical reactor to make the mercury more able to be deposited to ecosystems," said Seth Lyman, who did the work as a research assistant professor in science and technology at the University of Washington Bothell. For more see...
http://www.eurekalert.org/pub_releases/2011-12/uow-uaf121411.php

China's Shenhua to produce alumina from coal ash: Xinhua 19th December 2011, Joanna Lim, Platts

China's Shenhua Group began construction Sunday of a coal ash-based alumina refinery in the Inner Mongolia autonomous region, the official Xinhua news agency said. Shenhua plans to invest Yuan 135.8 billion (\$21.4 billion) in the project, deputy manager Ling Wen is quoted as having said. Located in the Jungar coal mining area in Ordos city, the project will include a 6.6 GW power plant, an alumina plant and a gallium plant. All of the plants will use materials recycled from coal burning. For more see...
<http://www.platts.com/RSSFeedDetailedNews/RSSFeed/Metals/8713183>

High end clean energy engineering targeted by UK Plc 19th December 2011, Toby Price, Renewable Energy Magazine

While the UK economy continues to struggle and waits with baited breathe for the euro zone crisis to resolve itself, the Engineering and Physical Sciences Research Council has decided to be proactive about job creation, launching a National Network of Energy Research Centres. The UK's engineering and manufacturing base has been shrinking for decades, and as the financial crisis and subsequent recession have taken their toll, many players in the UK are looking to develop the region's high-end engineering sector as a way of creating jobs and, ultimately, put UK Plc back on course to sustained growth. For more see...
<http://www.renewableenergymagazine.com/renewableenergy/magazine/index/pag/panorama/botid/47/colright/panorama/tip/articulo/pagid/18388/title/High%20end%20clean%20energy%20engineering%20targeted%20by%20UK%20Plc/>

Was the volcanic burning of vast coal fields the cause of the 'Great Dying' 250million years ago?

21st December 2011, Ted Thornhill, Daily Mail

Around 250 million years ago about 96 per cent of marine life and 70% of terrestrial life was wiped out – now researchers believe that the burning of vast coal fields by volcanoes was the cause. The event during the Permian period was known as the 'Great Dying' – the biggest-ever mass extinction - and researchers from the Scripps Institution of Oceanography in San Diego believe that when the coal was set alight it released so much heat-trapping carbon dioxide that life became impossible. For more see...
<http://www.dailymail.co.uk/sciencetech/article-2077043/Volcanic-burning-vast-coal-fields-Siberian-Traps-caused-Great-Dying-250m-years-ago.html?ito=feeds-newsxml>

New RFCS coal-related projects started in 2011

Project Number	Project category	Short title	Title	Duration (months)	Start date	Co-ordinator	Funding (€)
RFCP-CT-2011-00001	TGC 1	OPTI-MINE	Demonstration of process optimization for increasing the efficiency and safety by integrating leading edge electronic information and communication technologies (ICT) in coal mines.	36	01.07.2011	RAG Anthrazit Ibbenbüren GmbH	2,295,028
RFCR-CT-2011-00002	TGC 2	HUGE2	Hydrogen oriented underground coal gasification for Europe - Environmental and Safety Aspects.	36	01.07.2011	Główny Instytut Gornictwa	1,244,785
RFCR-CT-2011-00003	TGC 3	ENCIO	European network for component integration and optimisation.	72	01.07.2011	VGB Powertech	9,554,596
RFCR-CT-2011-00004	TGC 3	DCFC	Efficient conversion of coal to electricity - direct coal fuel cells.	36	01.07.2011	University of St. Andrews	1,218,181
RFCR-CT-2011-00005	TGC 3	FLOX-COAL-II	Development of scale-up methodology and simulation tools for the demonstration of PC-FLOX burner technology in full- scale.	36	01.07.2011	University of Stuttgart	1,614,524
						TOTAL	15,927,114

It is interesting to note that of the 44 projects approved to start in 2011, only 5 were in the coal sector.

CALENDAR OF COAL RESEARCH MEETINGS AND EVENTS

Date	Title	Location	Contact
14th to 16th February 2012	Coal-Gen 2012 Europe: Coal : Here to Stay - The Reality of Europe's Energy Mix.	Expo XXI, Warsaw, Poland	For more information visit http://www.coal-gen-europe.com/index.html
13th March 2012	11 th Annual APGTF Workshop	1VS Conference Centre, (1, Victoria Street), Westminster, London	Judy Henson E-mail : judy.henson@apgtf-uk.com
Wednesday 14th March 2012	Carbon Capture & Storage – Can the UK Maintain a Leadership Role? joint seminar between the Advanced Power Generation Technologies Forum and the APG Division of the Coal Research Forum.	1VS Conference Centre, (1, Victoria Street), Westminster, London	Mr. Peter Sage E mail : p_sage@sky.com
27th to 28th March 2012	2 nd International Workshop on Biomass Co-firing with Coal.	Hotel Phoenix, Copenhagen, Denmark	For more information visit http://cofiring2.coalconferences.org/ibis/cofiring2/home
Wednesday 25th April 2012	Oxyfuel Combustion, Coal Research Forum Annual Meeting and CRF Combustion Divisional seminar.	Drax Power Station, Selby, North Yorkshire	Dr. David J.A.McCaffrey Tel : 01242 236973 E mail : mail@coalresearchforum.org
19 th to 21 st April 2012	Workshop on upgrading and efficiency improvement in coal fired plant.	Stamford Plaza Hotel, Melbourne, Victoria, Australia	For more information visit http://upgrading.coalconferences.org/ibis/Upgrading-workshop/home
Date to be Confirmed	Combustion Diagnostics, Control, Computational Methods & Process Optimisations, joint two-day conference between the British Flame Research Committee and the Coal Research Forum.	The University of Kent, Canterbury, Kent	Dr. John J. Witton Cranfield University E-mail : j.j.witton1@btinternet.com
3 rd to 7 th June 2012	The 37th International Technical Conference on Clean Coal & Fuel Systems	Sheraton Sand Key, Clearwater, Florida, USA	For more information visit http://www.coaltechnologies.com/pages/call_for_papers.html
Monday 10th to Wednesday 12th September 2012	9th European Conference on Coal Research and its Applications, (9th ECCRIA)	University of Nottingham, Nottinghamshire	For more information visit http://9.eccria.org/ibis/eccria9/home or contact Ms. Sian Green, E.ON New Build & Technologies Ltd. Tel : 02476 182909 E mail : sian.green@eon.com
15 th to 18 th October 2012	2012 Pittsburgh Coal Conference	David L. Lawrence Convention Center 1000 Fort Duquesne Blvd Pittsburgh, PA 15222	For more information visit http://www.engineering.pitt.edu/pcc/