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COAL NEWS

New Zealand

Planned 2011 production from Buller coalfield

Bathurst Resources Ltd plans to begin a new export coking and thermal coal export mine from Buller by late 2011. The company plans to initially mine from the Denniston escarpment and later develop the remaining potential 50-90Mt within its Buller coal resource.

Bathurst Resources said that its initial production target is 1Mt/year, increasing to 2Mt/year. The company has entered into an initial joint venture with L&M Coal Holdings leading to a 100% acquisition.

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Bathurst plans to exploit both hard coking coal and thermal coal from the same Brunner Coal Measures as at Stockton with the primary mining seam Mangatini up to 10m thick under overburden varying between 20 and 40m.

The company lists a number of prospects within the permits. The Denniston-Escarpment area has an exploration target of 5-10Mt, Denniston-Western Plateau 10-25Mt with Banbury and Burnetts Face another 1-2Mt.

Under Bathurst's development plan, coal would be mined by open cut mining. A wash plant would be built on site and a 4km slurry pipeline to the railhead. Coal would be railed to Westport 10km away and



shipped to New Plymouth for export by Panamax sized ships. Capital expenditure was expected to be about NZ\$70-83M with operating expenses between \$75-100/tonne.

Spring Creek output target rises

Solid Energy said the Spring Creek underground coal mine near Greymouth is expected to lift production to around 700,000 tonnes. In the 2009/10 year ended on 30 June, Spring Creek achieved its biggest annual production to date, delivering 589,000 tonnes to its coal processing plant for washing and loadout to rail. Solid Energy operates Spring Creek and owns 51% of the mine in a joint venture with international trading firm Cargill.

Solid Energy has negotiated a 50% rise in export coking coal prices to around US\$200/tonne in line with recent international coal price trends. The company said that the higher price would apply to its coking coal export contracts that were renewed in April. Discussions were under way on remaining contracts which are due for renewal from July 2010. Demand was growing stronger, particularly from China and recently spot coking coal prices had risen to US\$230-\$260/tonne.

Solid Energy upgrades Stockton mining fleet

Solid Energy has placed a second large order for mobile plant and equipment for its Stockton opencast coking coal mine near Westport.

The \$65M order, to be delivered by the end of 2010, follows a \$75M order made in 2009 that together will update the mine's core mining fleet. Productivity at the mine will be raised with a smaller mining fleet capable of moving greater amounts of waste rock.

The latest order follows other recent investments at Stockton in infrastructure upgrades and a large coal handling and processing plant, taking Solid Energy's capital spending at Stockton to just under \$280M in the last 18 months. Since late last year the mine is operated jointly by Solid Energy and Downer EDI Mining NZ Ltd through the Stockton Alliance.

The latest contracts include further Caterpillar machinery and Haulmax trucks from Gough Gough & Hamer Ltd. The orders will complete Stockton's coal mining fleet, upgrade its primary coal haulage capacity and provide the smaller mobile plant needed for on-site civil engineering work such as mine site rehabilitation, building and maintaining the mine's roading and extensive water management infrastructure.

Geotechnical work at Mataura Mine

Solid Energy has started investigating ground conditions at its former Mataura Mine site as part of a pre-feasibility study looking at where to locate a new briquetting plant for lignite upgrading. The proposed plant, which would be capable of producing up to

100,000 tonnes of briquettes/year from Southland lignite for export and commercial use, is a joint venture with US based GTL Energy Ltd, and one of three lignite conversion projects proposed by Solid Energy in Southland.

A drill rig is being set up at the former Mataura Mine to complete a geotechnical profile to show whether the site can support a briquetting plant, while investigations continue at the other two proposed plant sites – the old Mataura Paper Mill and New Vale Mine.

Solid Energy said that while the former Mataura Mine is a possible location, more work needed to be done to check soil stability because the soil there is overburden from the old mine workings. Once that information is available, the company can make an assessment of the suitability of the various sites, taking into account their proximity to transport, water, available lignite and electricity.

Central Otago mine could supply NZ's diesel needs

A proposed lignite mine near St Bathans in Central Otago could yield enough barrels of fuel a day to meet New Zealand's diesel needs as well as creating 2700 jobs, according to L&M Central Otago Lignite, the company holding exploration permits for the Hawkdun lignite deposit. The boundaries of the 65,000ha Oteake Conservation Park were amended last year to exclude a 195ha area over the Hawkdun deposit.

L&M Group said Hawkdun is one of five lignite projects in Otago and Southland being explored by the company. The others are at Kaitangata and Ashers-Waituna, near Invercargill. No decision had been made on which projects the company would seek mining permits for.

Solid Energy secures access to upgrading technology

Solid Energy has signed an agreement with Australian company Ignite Energy Resources Pty Ltd (IER) securing the exclusive New Zealand rights to a technology which converts low energy feedstocks, such as lignite and biomass, to high grade coal and synthetic crude oils which have the potential to be upgraded to transport fuel.

The binding heads of agreement will lead to a licence agreement, worth up to A\$15M, plus royalties. Solid Energy and IER will work together to further develop and commercialise the technology and will construct and commission a pilot plant able to process lignite and biomass in New Zealand. The commercial pilot plant, in a yet to be determined location, will be capable of expansion to a 1Mt/annum facility.

IER is currently converting Gippsland Basin lignite to synthetic crude oil and high grade coal at a pilot plant in Somersby, New South Wales. Another



demonstration project on the Victorian lignite fields aims to process 60,000t of brown coal/year to make 60,000 barrels of oil and 18,000t of high grade dry coal. This high grade product has the potential to be used in the steel making process.

While the technology is still to be proven at commercial scale, according to Solid Energy, it has great potential for our Southland lignite and biomass resources.

Solid Energy said it is progressing all its Southland lignite projects in parallel as there are sufficient resources in Southland to accommodate its briquetting plant, coal to fertiliser project, lignite to transport fuel project and many others besides. The company said the key to the success of all of these is to find the technologies which can best be applied in New Zealand.

UCG pilot project in Waikato

Solid Energy plans to build a \$22M pilot project to trial the underground coal gasification (UCG) technology in Waikato to convert up to 30,000 tonnes of underground coal into synthetic gas.

The company plans to operate the pilot project for up to two years on a private property within the company's existing Huntly West coal mining licence area.

Solid Energy said the UCG process will allow access to coal seams which would otherwise be nearly impossible to mine using conventional mining technology. It is working with Ergo Exergy of Montreal, Canada, which has successfully developed UCG projects in several countries around the world, meeting stringent safety and environmental standards.

The UCG process gasifies coal deep underground (usually between 200 and 800m), producing syngas to generate electricity, or to make a range of high-value chemical products such as synthetic transport fuel, methanol, fertilisers or waxes, plastics and detergent products and pure hydrogen.

For the Waikato pilot plant, Solid Energy plans to drill up to seven wells about 25 to 50m apart into an underground coal seam 400m below the surface. It will also install a number of other wells on site to gather process and environmental data. The surface plant, including wells, is expected to be contained within an area measuring 300 by 150m.

The pilot plant will yield process, technical and geological information, and verify modelled environmental effects. Once the required information has been gathered, Solid Energy will shut down the pilot plant. Results from the pilot will determine whether Solid Energy takes the project further to a commercial operation.

L&M Energy also has plans to use UCG technology in the Waikato. The company has applied for prospecting rights over 2000 km² of the Waikato, bracketing the Huntly coal mines.

LME said that coal thickness of up to 15m had been documented by mining and exploration, with more than 250 holes having been drilled in various programmes, including its own eight wells for the extraction of coal seam gas.

L&M Energy to develop Southland CSG supplies

L&M Energy has raised NZ\$8.5M from institutional and other investors for production testing and booking of 2P coal seam gas reserves in Western Southland and further exploration drilling in the area. Some of the money would also be used for ongoing conventional work programme obligations and working capital. The CSG pilot testing programme is due to start in August or September with a target of certifying the company's first 2P reserves around Ohai by early 2011.

L&M Energy said the funds will also be used for investigating the potential of a micro-LNG facility in the area to fast track development of Southland CSG. The company earlier said it had signed an agreement with HW Richardson Group to investigate the feasibility of developing small scale liquefied natural gas (LNG) projects using LME's 173PJ (3P) coal seam gas asset at Ohai. HW Richardson Group is one of New Zealand's largest privately owned transport companies with over 1,000 employees and over 740 trucks. LNG powered vehicles are becoming common in other parts of the world, including Australia, where LNG is recognised to significantly reduce greenhouse gas emissions compared to traditional fuels while insulating from oil price fluctuations.

Meanwhile, L&M Energy has surrendered three of its petroleum exploration permits in the South Island as part of its on-going portfolio review. The company's priorities remain in expanding 3P CSG reserves at its licences in Southland, converting those to 2P reserves, and also the exploration programmes at the CSG target in Waikato and the conventional target at onshore Taranaki.

Comet Ridge plugs low productivity CSG well

Brisbane based Comet Ridge Ltd has plugged and abandoned one of its intended coal seam gas pilot wells, Macdonald 6P near Greymouth, after finding lower productivity than expected from a deep coal seam. Comet Ridge said the well encountered 5.4m of gassy coal in the Brunner Formation but a drill stem test indicated that permeability was lower than expected and the well would not produce at commercial rates. The well reached a total depth of 822m.

Comet Ridge said the well had intersected the main coal seams deeper than expected and this was likely



to be a significant contributing factor to the low productivity result. While the level of permeability was disappointing, the company was pleased that the well showed continued lateral continuity in the coal in the Brunner Formation in this area of the permit.

Comet Ridge in June completed and fitted for production testing its first New Zealand CSG pilot well in Macdonald 4P well nearby. This well encountered 18m of coal in the Paparoa and Brunner Formations. Pressure monitoring gauges have been installed on two nearby observation wells.

Power feasibility studies are also being undertaken, which have indicated that gas produced could provide the basis for an electricity generation scheme providing power into the local grid.

Government consults on new EEC Strategies

Submissions are being requested (by 2 September) on new drafts of the NZ Energy Strategy and the NZ Energy Efficiency and Conservation Strategy. The government's goal for energy in the New Zealand economy is to make the most of the country's abundant energy potential through the environmentally responsible development and efficient use of the country's diverse energy resources.

The government expects to achieve this goal under four priority areas of developing resources, secure and affordable energy, energy efficiency, and environmental responsibility by focusing on 12 areas, including developing petroleum, mineral fuel and renewable energy resources, embracing new energy technologies, delivering value for money through competitive energy markets, enhancing business competitiveness through energy efficiency, providing better consumer information to inform energy choices and reducing energy related greenhouse gas emissions.

The strategy retains the target that 90% of electricity will be from renewable energy by 2025, providing this does not affect security of supply. It also has "an ambitious but achievable target" of 55 PJ in energy saving across the economy by 2015.

The government said it is important to update the previous strategies so that they are aligned to current energy policy and are refocused on this government's economic growth agenda. It is argued that the draft NZES paints a vision for the country's energy future so that industry participants and investors can act with confidence. It is further stated that these draft strategies are more succinct and sharply focused statements of government energy policy rather than action plans. By focusing on near term actions, the 2007 strategies quickly became out of date.

The government is inviting feedback on the proposals set out in both draft strategy documents with a submission deadline of Thursday 2 September.

Submissions will inform development of the final strategies (to be released by December) that will set out the strategic direction for future energy policy and investment decisions. Documents and details on how to make a submission are available at www.med.govt.nz/energystrategy.

INTERNATIONAL NEWS

Australia

Bid for Queensland rail track network

Australian coal miners made a joint A\$4.85 billion cash bid for a rail track network in Queensland, aiming to prevent it being sold onto the stock market in a wider privatisation.

The group of 13 firms headed by BHP Billiton, Rio Tinto, and Xstrata said its bid for the network was conditional on the Queensland state government dropping its plan to sell both the track network and the coal haulage business in an initial public offer.

Coal miners are concerned that if both the tracks and trains are sold together as envisaged by the government, the new private owner would exert too much power over the coal industry. Most of Australia's coal ports are dogged by infrastructure constraints and suffer from endemic congestion, with the bottlenecks resulting in lengthy queues of ships waiting for berths.

The government said it would consider the merits of the bid, whose backers also include Anglo American, Peabody Energy, Yanzhou Coal Mining, Vale, Wesfarmers, and Macarthur Coal. The group is hoping it has pitched the offer high enough to make the Queensland government rethink its plan for an estimated A\$7 billion initial public offer of the entire coal transport business.

The bid covers four track systems in the central Queensland network, as well as an expansion project, that are used mainly or solely by the coal industry. The Queensland government is selling its state owned railway, port and forestry assets in a bid to raise A\$15 billion needed to help reduce the budget deficit.

Vale to buy out stake in hard coking coal project

Brazilian company Vale will exercise its option to buy a 24.5% stake in an Australian hard coking coal project from mining firm Aquila, lifting its stake to 100%. The purchase price for the stake in the Belvedere Hard Coking Coal project in Queensland will be based on a "fair" market value.

Peabody Energy approves expansion of coal mine

Peabody Energy approved the upgrade and expansion of the Metropolitan Mine in New South Wales. The expansion is expected to increase capacity by 1Mt within several years. Capital investments for the expansion are expected to total A\$70M, of which



approximately \$15M is targeted for 2010. Metropolitan Mine received final permits to proceed with the expansion in the second half of 2009.

In 2009, Metropolitan shipped 1.5Mt of mostly hard coking coal for export to Asian steel producers. Metropolitan Mine is an underground mine using the longwall method and its coal is shipped through Port Kembla.

Peabody has multiple Australian expansion projects targeted at raising the company's metallurgical coal shipments to 12 to 15Mt/year by 2014, while increasing thermal coal export capacity to 15 to 17Mt/year. Peabody is targeting a 20 to 30% increase in 2010 to meet growing global demand.

China

China plans to make rapid energy strides

The Chinese government said it will take radical measures to increase the use of new energy in the 12th Five Year Plan (2011-15), a move that reinforces the nation's commitment to improve the energy mix and reduce emissions. Development of new energy sources, including nuclear, hydro, wind and solar will be highlighted in a stimulus plan for the energy industry. Biomass and clean coal technologies would also account for a significant part of the country's energy plans.

China has already set a target to increase the use of non-fossil energy to 15% of primary energy consumption in 2020. According to a recent report by World Bank, China needs an additional investment of US\$64 billion annually over the next two decades to implement an "energy-smart" growth strategy.

The country made a plan in 2005 to increase its nuclear power capacity to 40GW in 2020, when it would account for 4% of the country's total power capacity. But in line with the quick growth of the industry, the target has been raised to 70 to 80GW, compared with the current total capacity of 9.1GW (around 1% of the nation's total power capacity).

Some analysts said it will be a long time before the new energies actually emerge as alternatives to coal and oil, which are likely to remain the mainstream energy sources in the country.

China to reduce emissions

China's energy watchdog, the National Energy Administration, signed agreements in May with 26 provincial governments to close at least 10,000MW of outdated coal fuelled power capacity before October. The agreement means China will have closed 70,000MW of small scale, outdated thermal power station capacity in the 11th Five Year Plan period from 2006 to 2010.

If achieved on time, the plan will save 81Mt of coal annually, or 2.6% of the coal used in 2005; eliminate

1.4Mt of sulphur dioxide emissions (5.5% of 2005 levels) and cut CO₂ emissions by 164Mt (3.2% of 2005 levels).

China may face coal shortfall by 2015

China, the world's biggest user and producer of coal, may face a shortfall of 200Mt of the fuel by 2015, according to China Oil, Gas & Petrochemicals. Coal demand may rise to a record 3,800Mt by 2015 as domestic coal output reaches 3,600Mt, according to unsourced estimates by China OGP in the latest issue of this newsletter.

China became a net coal importer for the first time in 2009 after buying 126Mt when global prices were lower than the cost of domestic grades. The country's increased coal consumption last year helped support global demand, which otherwise "would have tanked," according to market experts.

Positive gas results in CBM drilling

Petromin Resources Ltd announced that Terrawest Energy Corp has reported positive results of gas desorption testing of drill core samples from its Liuhuanggou coalbed methane Project in Xinjiang, China. The 2009 drilling programme included testing coal drill core samples taken from both the Xishanuyao (J2X) and Badaowan (J1B) formations.

One well was drilled to 726m and intersected over 50m of J2X coal. CBM desorption testing was initiated as planned and the results indicate the J2X to have greater gas content than previously anticipated. The gas content results for the J2X are especially encouraging when combined with the thickness of the coal seams.

Desorption results for J1B coal samples taken from two wells (749m and 844m) indicate the J1B coal to be generally higher in gas content than the J2X.

CBM desorption testing of the coal samples was completed by the Laboratory of the Xinjiang Coal Bureau in Urumqi, Xinjiang, China under the guidance of Norwest Corporation of Calgary, Canada. Norwest Corporation designed and supervised the drilling and coal drill core sampling programme and analysed the gas content. Norwest also conducted the sampling and preparation of samples of other rocks including shale.

China to improve coal mine safety facilities

China will improve safety facilities in mines nationwide to prevent and tackle mining disasters. According to the State Administration of Coal Mine Safety, by 2015, all mines would be equipped with safety facilities to enhance their safety monitoring and emergency response capacities.

Each mine would establish systems to monitor the underground conditions and locate the underground workers, as well as ensure a good communication



system. Safety chambers and other rescue facilities would be built to provide a safe shelter, oxygen and clean water to trapped workers when a disaster occurred.

India

NTPC to buy Australian coal mine

NTPC Ltd is set to buy a controlling stake in a coal field in Australia in a deal valued at A\$1 to \$1.5 billion. The 720Mt Australian coal field will enable state run NTPC to fire about 3,500MW of power capacity. The coal mines, located near Perth, would allow NTPC to bring to India up to 10Mt of coal annually for its plants.

NTPC is in touch with a power producer in Australia that has expressed interest in selling the company's assets that include a small power project, a coal mine and large undeveloped coal field. NTPC will place its bid once the mode of selloff is decided by its current owners.

NTPC said it had formed a joint venture with state run Coal India to acquire coal assets in India and abroad.

Government vows to end coal mafia

The Indian government vowed to crack down on coal criminal groups or mafia, which according to some estimates consists of at least 10,000 groups.

The Coal Minister said the coal producing areas are affected by twin problems of naxalism and mafia. He also said that mafia, pilferage and theft are eating into productivity and profitability of the coal companies at the cost of the nation.

The majority of the coal producing belt in the country is dominated by mafia operations, according to trade unions in the coal sector. At least 10,000 mafia groups operate in the country mostly concentrated in Coal India Ltd collieries and the annual plunder is not less than 5-6Mt causing huge loss to the state exchequer.

India is home to cumulative coal reserves of 267 billion tonnes and coal accounts for 55% of the country's energy needs.

Mafia operations are more rampant in CIL subsidiaries like Central Coalfields Ltd, Bharat Coking Coal Ltd, Eastern Coalfields Ltd and SCEL and the coal mafia virtually ran a parallel administration there.

FLSmidth's coal handling project

FLSmidth has been awarded a contract by Korba West Power Corporation Ltd for supply and installation of a 1,800 tonnes/hour coal handling plant for a 2 x 600MW power plant in Raigarh, Chhattisgarh. The company is a wholly owned subsidiary of Avantha Power & Infrastructure Ltd.

The order comprises track hoppers, paddle feeders, stacker, reclaimers and pipe conveyors as well as a belt conveyor system, ring granulators, vibrating grizzly feeders and trippers. electrical and air pollution control equipment.

Indonesia

Indian company buys Indonesian coal mines

Indian company Reliance Power Ltd has bought two companies that own three coal mines in Indonesia. The company said coal from these mines would be used in the 4,000MW Krishnapatnam power project and other power units of the group.

Reliance joins the Essar group and Tata Power in securing coal assets in Indonesia to supply power plants in India. Reliance Power plans to build 16 power plants with a total capacity of 33,780 MW, including seven coal-fired plants and seven hydroelectric plants.

Kenya

Portland cement to install coal plants

East African Portland Cement intends to shift its source of energy from oil fuel to coal as an increasing number of local companies start generating their own electricity to help lower power costs, improve reliability of supply and add new sources of revenue.

The company has already announced plans for a coal plant that include the recycling of waste heat from its clinker furnaces. The company will also come up with more environmentally friendly products and by-products which will help in value addition. The utilisation of coal and biofuels by the company will help reduce the cost of energy drastically.

The company has put in place several measures to ensure that the manufacturing of cement is done in an environmentally friendly manner, paying particular attention to greenhouse gas emission reduction.

Mongolia

Bids for world's largest coking coal mine

Mongolia will exploit Tavan Tolgoi, the world's largest coking coal mine this year. Chinese miners including Shenhua Group are competing for the rights against miners from other countries, including the US, Japan, and Australia.

Up to 49% of all shares in Tavan Tolgoi, with coking coal reserves of 6,400Mt, could be transferred to foreign partners, and Mongolia will have more than 50% of the rights, according to Mongolian legislation.

China's Shenhua Group Corp and Erdos Chenglong Coal Corp, along with miners from the US, Japan, Russia, Australia, Brazil, Korea, and India have delivered their exploitation plans. Rio Tinto and BHP Billiton are also among the bidders, but "plan to propose plans later".



The exploitation project and its most sensitive documents were discussed in April and submitted for review by the Mongolian government.

Leighton Asia wins contract for Khushuut mine

Mongolia Energy Corporation (MEC) has awarded Leighton Asia a A\$273M, six-year contract to develop and operate the Khushuut coal mine project in western Mongolia. The contract is based on a mine plan which ramps up to an initial 3Mt of coking coal per year and includes 48.5M m³ of material movement. Eventually, annual output is anticipated to increase to 5 to 6Mt.

Leighton Asia is responsible for all mining activities including load and haul of waste, load and haul of coal, drilling and blasting, mine planning, technical support, site camp management and catering services.

MEC has 149Mt of JORC coking coal resources in Khushuut. This is within 600 hectares of around 330,000 hectares of MEC's concession areas in western Mongolia. MEC has upgraded a 310km roadway for transportation of coking coal from the Khushuut Mine to Xinjiang, China.

Peabody Energy completes JV agreement

Peabody Energy announced that it has completed the acquisition of a 50% interest in Peabody-Polo Resources BV, a joint venture that holds Polo's Mongolian coal interests.

The joint venture holds coal licences throughout Mongolia, with a significant number of licences in the South Gobi region. Mongolia has substantial metallurgical and thermal coal resources that are strategically located to serve high demand China and Asia markets.

The joint venture will continue its exploration activities with the goal of identifying properties and projects that can be developed to serve these markets. Peabody continues pursuing multiple business development opportunities in Mongolia. Peabody also maintains warrants to acquire an approximate 15% equity interest in Polo Resources Ltd.

Philippines

SMC buys 3 coal mines in Mindanao

San Miguel Corporation (SMC) has acquired 3 coal mines in Mindanao with resources capable of generating an initial 1,200MW.

SMC said that aside from Daguma Agro Minerals Inc, which it bought early this year, the company has bought Bonanza Energy Resources Inc and Sultan Energy Mining and Development Corp.

The aggressive acquisition of coal mines was meant to further ramp up the generating capacities of San Miguel's planned coal fired plants in Mindanao, which

has been experiencing a shortage in power supply since the beginning of the year.

The company is still looking at other opportunities and prospective coal sites in Mindanao. They are in the process of consolidating all the coal mines in the area so that the coal deposits will be better characterised. Once potential volumes are known, SMC will put up a mine mouth power plant.

Earlier, SMC said that they are planning to put up a 300MW mine mouth coal power plant in General Santos City following its acquisition of Daguma's coal mine. A 300MW coal facility would need about 750,000t of coal /year.

Deal on Isabela coal power plant

San Miguel Corporation (SMC) has expressed interest in putting up a small coal fired power plant within the concession area of PNOC-Exploration Corp in Kawayan, Isabela.

PNOC-EC said it had been discussing with San Miguel either a partnership for the construction of the proposed power facility or a coal supply agreement for an SMC owned plant.

PNOC-EC has recommended the construction of a 50MW coal fired power plant, which can be further expanded to generate as much as 100 MW.

San Miguel has been aggressively acquiring coal mines throughout the country as it targets to further strengthen its presence in the power generation industry.

Sagittarius Mines investing in coal fired plant

Sagittarius Mines Inc, a local subsidiary of Xstrata Copper, is investing in a coal fired plant to power its operations for the Tampakan copper-gold project in southern Mindanao.

The power plant will have a capacity of 400MW and would cost about 10 to 20% of the US\$5 billion mining project. Full scale production is projected for 2016.

Xstrata has a controlling 62.5% interest in the Tampakan project, which is considered the largest undeveloped copper-gold deposit in Southeast Asia.

South Africa

Asia tops SA coal exports list

South Africa exports more than half its coal production to Asia, according to IHS McCloskey, compared with about 15 % three or four years ago.

India and China, where economies are expanding at annual rates greater than 8%, together accounted for about 42% of shipments from Richards Bay in the first quarter this year.



JSW Energy scouts coal deals

JSW Energy has entered into a deal with Osho Ventures FZCO and Indian Ocean Mining (IOM) Pty Ltd for coal prospecting rights in South Africa. The company said they intend to acquire a 70% stake in IOM from Osho which has certain coal prospecting rights in the northwest region of South Africa.

JSW Energy said the deal is still an MoU and a commercial agreement will not be signed until the due diligence has been conducted on the site.

JSW Energy is on track to achieve its 3,140MW production target by December 2010, a major increase from the current 995MW. At the peak, JSW Energy will need 6-6.5Mt of thermal coal and they are looking to have 100% raw material security. The company is also aggressively looking at other regions in the process of evaluating more potential coal mines.

South Africa to account for Eskom plant CO₂'

The US administration said it intended to hold South Africa to its promise to act on climate change after the country secured US\$3.75 billion in World Bank funds to build one of the world's biggest coal plants (together with an improved coal rail system and a 100MW wind and a 100MW concentrated solar plants).

The US government abstained on the World Bank vote to fund Eskom to build the 4800MW Medupi power station because Democratic leaders in the Senate had called on the administration to try to block the deal and the US Treasury was very critical of the project.

South Africa, in the run-up to the Copenhagen summit, committed to a 34% reduction in business as usual emissions by 2020 and 42% by 2025 but it is claimed these targets are put in jeopardy by the plant.

The World Bank acknowledged South Africa's achievement of increasing energy access by 30% over the past 16 years. It also noted South Africa's pivotal role as generator of 60% of all electricity consumed on the African continent and the importance of a functioning electricity sector for job creation, economic progress, human welfare, and poverty reduction.

USA

EPA faults coal plant's permit

The Environmental Protection Agency has sent an objection over an air permit issued for a planned coal fired power plant in central Kentucky. The EPA objected to the portion of the permit that deals with fine particle emissions at the proposed JK Smith Unit 1 in Clark County.

Opponents of the plant have argued that the \$760M facility would place a financial burden on the cooperative's members. The state has 90 days to satisfy the EPA's objection or the permit could be denied.

Massey Energy begins new metallurgical coal mine

Massey Energy Company has begun the development of a new metallurgical coal mine within its Rowland reserve in Raleigh County, West Virginia. The Rowland reserve consists of 56Mt of mostly low and medium volatile metallurgical coal and is located adjacent to Massey's existing Marfork operation.

The new mine is the first among several that are planned to be combined in a new mining group on the Rowland reserve. Massey estimates that the new resource group will eventually produce as much as 2Mt of metallurgical coal annually and employ over 500 miners.

Massey acquired most of the Rowland reserve in 1998 and added to it with several small acquisitions in 2008. Initial development of the property and construction of the mine is expected to be completed in time for the 2011 export season.

Capital expenditures for the development of the mine in the Beckley seam and associated processing plant and facilities are expected to be in the range of US\$100 to \$160M. Approximately \$20-30M of these expenditures are planned to occur in 2010, with the remainder in 2011 and 2012.

National Coal Corp completes sale of rail line

National Coal Corp announced the sale of 70km of rail line between Oneida and Devonia, Tennessee to RJ Corman Railroad Property LLC for a purchase price of approximately US\$3M.

The rail line previously provided National Coal with access to reserves on the New River Tract as well as a preparation plant in Devonia, which was recently sold in a separate transaction. This rail line sale includes any and all tracks, rails, ties, switches, crossings, bridges, and trestles as well as all other trackage, appurtenances, improvements and fixtures.

National Coal's continuing operations in Tennessee include the coal mineral and mining rights to approximately 20,000 hectares of land, along with mining complexes that include one active underground mine and one active surface mine.

In addition, National Coal continues to own and operate one preparation plant and one unit train loading facility served by the Norfolk Southern Railroad.

NAS urges emission charges

The National Academy of Sciences urged the US government to take drastic action to raise the cost of using coal and oil to slow global warming. The Academy specifically called for a carbon tax on fossil fuels or a cap-and-trade system for curbing greenhouse gas emissions, labelling global warming an urgent threat. They said the nation needs to cut



emissions by 57% to 83% by 2050, which is close to President Barack Obama's goal.

The academy has called climate change a problem but hasn't recommended a specific policy. The impetus for its bolder stance was a request by Congress to look at climate change and how the nation should react.

The cap-and-trade idea, supported by the Obama administration, has been proposed for several years in Congress but has never passed the Senate.

The national academy is an elite independent organisation chartered to give the federal government advice on science and technical matters.

Company buys West Virginia coal reserves

Penn Virginia Resource Partners bought another 10Mt of coal reserves in northern West Virginia for US\$17.7M.

The company said the new tonnage is located near 40Mt of Pittsburgh seam coal the company bought eight years ago. Penn Virginia leases out the reserves it owns to mine operators and earns its money from royalties.

Clean coal power plant to revive Illinois coal industry

Tenaska-Taylorville Energy Center (TEC) announced that the Facility Cost Report submitted to the Illinois Commerce Commission (ICC) under the Clean Coal Portfolio Standard Law demonstrates the project can be built cost effectively and will result in nearly 2,500 construction jobs and an almost 2Mt/year net reduction in CO₂ emissions.

Once constructed, TEC will be the cleanest coal fuelled commercial scale power plant in the United States, converting Illinois coal into substitute natural gas, and then efficiently burning the gas to produce electricity.

Under the Illinois Clean Coal Portfolio Standard Law, the project was required to perform a Front End Engineering and Design (FEED) study to estimate the cost based upon a detailed engineering assessment of the labour and materials needed to build the plant. The FEED study was paid for in part through an US\$18M grant by the Illinois Department of Commerce and Economic Opportunity.

After investing tens of millions of dollars and hundreds of thousands of hours of effort, the company is more convinced than ever that the TEC will lead to a renaissance for the Illinois coal industry and a resurgence of the economy of Central and Southern Illinois.

Old coal power plants to upgrade pollution controls

The US Environmental Protection Agency has proposed a rule renewing an attempt to reduce pollution in areas around coal plants and in states downwind where air quality is hampered by sulphur dioxide and nitrogen oxide emissions. Combined with other state and federal regulations, the rule will reduce sulphur dioxide emissions from 2005 levels by 71% by 2014 and nitrogen oxide emissions by 52%.

The rule requires aging coal-fired power plants in 31 states — many of which were built in the 1940s and 50s — to be upgraded with modern pollution controls. Scrubbers will need to be installed on more plants to cut back on sulphur dioxide emissions and selective catalytic reduction equipment will be required to curb nitrogen oxides. States will be allowed to engage in limited trading of pollution credits as long as each stays below a set emissions limit.

The rule is expected to cost \$2.8 billion/year but the EPA argues it promises greater benefits from fewer emergency room visits and early deaths.

The previous administration proposed a similar action, known as the Clean Air Interstate Rule. But in 2008, the US Court of Appeals for the District of Columbia decided the EPA had overstepped its authority and ordered the agency to revise the rule. As a result, many power companies scaled back their investments in pollution controls. Now those companies will have to decide whether it is more cost effective to retrofit their dirtiest power plants or shut them down.

President Obama's requests for fossil energy programmes

President Obama's FY 2010 budget seeks US\$882M for the Office of Fossil Energy (FE) to support improved energy security and rapid development of climate oriented technology, including \$618M for Fossil Energy Research and Development.

Additionally, the FE R&D program will be complemented by \$3.4 billion from the American Recovery and Reinvestment Act of 2009. These funds will be used to advance research, development and deployment of CCS technologies.

The budget request for FE's Fuels and Power Systems programme is \$404 M. Initiatives will focus on RD&D of technologies to use coal more cleanly and efficiently. The core R&D efforts focus on: the creation of a portfolio of technologies that can capture and permanently store CO₂ from power plants and industrial processes; carbon capture for existing coal fired power plants; improved gasification technologies; coal-to-hydrogen conversion; development of fuel cells; and improved turbines for future coal based combined cycle plants.



The US Department of Energy is requesting \$180M for FE's Carbon Sequestration programme. By developing technologies to dramatically decrease the release of CO₂ into the atmosphere, it is argued the country can continue to use its extensive coal resources while reducing the impacts on global climate change. CCS is the primary pathway that DOE is pursuing to enable the sustainable use of coal as part of the nation's clean, secure energy portfolio in a carbon constrained future.

The budget request for the IEP programme is \$41M. The IEP programme is focused on developing post-combustion CO₂ retrofit technology. Post-combustion CO₂ capture technology can be used in pulverised coal power plants, which is the industry standard for coal fuelled electricity generation.

DOE is requesting \$55.0M for the IGCC programme. developing advanced gasification based technologies to: improve thermal efficiency of coal based IGCC plants and reduce the cost and energy penalty of achieving near-zero atmospheric emissions of all pollutants, including CO₂, sulphur dioxide, nitrogen oxides, and mercury. The programme will continue to develop technologies for gas stream purification to: achieve near-zero emission goals and meet synthesis gas quality requirements for use with fuel cells and conversion processes; enhance process efficiency and availability; reduce costs for producing oxygen; and system reliability. Accomplishing these goals will boost commercialisation prospects of advanced near-zero emissions IGCC technologies for use by utilities, independent power producers, and other industrial stakeholders.

Vietnam

Coal mines in Quang Ninh up till 2038?

Vietnam is seeking to incrementally raise annual extraction to 100Mt of pure coal by 2030, which will mean that most of the coal mines in Quang Ninh will be exhausted by 2038.

From now to 2030 the extraction rate is to reach 60-67Mt of raw coal per year, equivalent to 55-60Mt of pure coal. As a result, after the year 2030, it is estimated that Quang Ninh's coal mines can last for only a couple of years, and can not outlast 2038.

Vietnam Coal-Mineral Industries Group (TKV) proposed the government explore new mines in the Northeast with expected reserves of 1.23 billion tonnes. If the reserves are proven, the new mines could contribute 23Mt of raw coal per year until 2030 at maximum.

TECHNOLOGY & OTHER NEWS

CDM credits and coal efficiency

The Kyoto Protocol Clean Development Mechanism (CDM) Executive Board has approved a methodology that will allow credits for "new grid connected fossil

fuel fired power plants using a less GHG intensive technology". While not specifically restricted to coal, this methodology allows projects for new coal fired power plants to be registered as CDM project activities provided it uses a more efficient (cleaner) process. That is, a super-critical or ultrasuper-critical plant as opposed to conventional coal fired plants, would, subject to other factors, be eligible for registration as a CDM project and receive CER credits which could then be sold on carbon markets.

One project has so far been registered under this methodology in India (December 2009) and a further two Indian projects are under review. Other projects in India and China are known to be considering applications under this methodology.

Recently, and more prominently, the proposed 4800MW Medupi power plant in South Africa is considering an application under this methodology (discussed in the South Africa section above).

The World Coal Institute says improved efficiency is a major contribution to reduction of CO₂ emissions. Increasing the efficiency of a coal fired power plant reduces CO₂ emissions by between 2 and 3%. Modern, highly efficient super-critical and ultra super-critical plants emit almost 40% less CO₂ than older, more common subcritical plants. Constructing cleaner and more efficient coal fired plants also means they are built 'capture ready' for the potential future deployment of CCS technology.

Australia grants first carbon capture project

Depending on the outcome of feasibility studies, Australia's government will provide an additional A\$40M for the nation's first carbon capture project from the Yallourn coal fired power station in Victoria's Latrobe Valley. CO₂ will be converted into minerals that can be used in construction. The federal government and Victoria are already providing \$3.5M each for the project while California based Calera Corp is providing more than \$3.5M.

The additional funding will come from the National Low Emissions Coal Initiative, a government plan to reduce greenhouse gas emissions from coal, which provides about 75% of Australian electricity.

NSW clean coal projects funded

Ten projects worth A\$13M have been funded by the NSW State Government as part of the programme to clean up greenhouse gas emissions from the coal industry. They include projects to capture methane emissions from mines, totally new systems for generating power from coal using fuel cells and new ways of storing CO₂ in rocks so it is not released into the atmosphere.

Centennial Coal is working on a Ventilation Air Methane Regenerative After Burner at its Mandalong mine in the Hunter Valley and expects to have results



of a trial in 2012. The company said it is based on old coke oven technology in an innovative way to destroy greenhouse gases before they are released into the atmosphere. It will "substantially eliminate" about 650,000 tonnes of CO₂ equivalent being emitted a year.

GreenMag is a private company that has started up to commercialise carbon mineralisation technology developed by the University of Newcastle. "In ten years time, in one plant alone in NSW, we think we can mitigate 20Mt of CO₂ /year... while India and China have already indicated their interest in the technology, which is carbon capture and use, rather than just pure storage."

The University of Newcastle is also being funded to work on social research on the public acceptance of low emission coal technologies.

CO₂CRC highlights long term stability of Otway

In response to a Danish professor's concerns raised about long term leakage from CO₂ storage sites, Dr Peter Cook, chief executive of the Cooperative Research Centre for Greenhouse Gas Technologies (CO₂CRC) said Professor Shaffer's figures for geological sequestration mirrored the conclusions reached by the Intergovernmental Panel on Climate Change (IPCC).

Dr Cook, who was involved with the IPCC study, said "as long as you have the right rocks to store the carbon in, then sequestration will do what nature does anyway in keeping CO₂ out of the atmosphere".

"We have the Otway Basin Project which has been going for two years. We've injected 65,000 tonnes there with no leakage. We compress the CO₂ gas into a liquid and inject it into porous rocks below non-porous strata, trapping it deep underground." He said the professor's study did not take into account the fact that CO₂ stored underground becomes denser over time. "It will actually sink further down rather than bubble up towards the surface."

Shaffer said society should be targeting the source of CO₂ rather than relying on capture and storage. Dr Cook said under the current set of circumstances CCS will be needed. "As long as we use fossil fuels geological sequestration will need to be part of the cycle."

China starts building first CCS project

China started construction in July of its first CCS project in Ordos in Inner Mongolia. The project will cost US\$31M and will be able to hold 100,000t of CO₂/year, according to China National Petroleum Corp, the country's biggest oil producer and the plant's designer. The facility will start operations by the end of the year.

The plant's annual capacity will be expanded to 1Mt and 3Mt in two phases in the future, according to the company, but a time frame was not given. The plant is built on the site of a coal-to-liquid project constructed by Shenhua Group Corp, the nation's largest coal producer.

South Korea to invest in CCS

The South Korean government said recently that the country's total public and private investment in CCS would reach an estimated US\$1.9 billion to 2019. Public sector investment would account for half of the total. A government official said Korea Electric Power Corp was currently leading local investment. The state run utility said last September it would spend \$2.4 billion won to develop environment friendly technology including CCS by 2020.

South Korea, the OECD's fastest growing carbon emitter and the world's fifth largest oil importer, a year ago vowed to invest about \$90 billion, or 2% of its annual GDP, in environment related industries over five years starting from 2009.

Governments face cost hurdle to halve CO₂

In its 2010 edition of its Energy Technology Perspectives report, the International Energy Agency has said governments will have to grapple with sharply higher upfront costs to deploy clean energy technologies and halve carbon emissions by 2050. IEA, the energy advisor to 28 industrialised nations, said governments will have to pay 17% higher upfront costs to cut carbon emissions in line with levels that many scientists say will avoid more dangerous climate change.

Those extra US\$46 trillion costs through 2050 reflected higher capital costs for wind power compared with coal and gas plants, for example. But that masked savings of US\$112 trillion compared with no new action to fight climate change, as many renewable energy technologies have almost zero running costs, leading to substantial fuel savings.

The IEA said the next decade is critical: if emissions do not peak by around 2020 and decline steadily thereafter, achieving the needed 50% reduction by 2050 will become much more costly, and the opportunity may be completely lost.

Governments would have to intervene on an unprecedented level to tweak energy markets and avoid locking in high emitting, inefficient technologies over the next few years. "They must take swift action to implement a range of technology policies that target the cost-competitive gap while also fairly reflecting the maturity and competitiveness of individual technologies and markets," the report said.

Government funding for research, development and deployment in low carbon technologies will need to be two to five times higher than current levels. The Paris



based agency warned that a severe skill shortage could quickly become a major hurdle to deployment across all sectors and all regions.

Building a low-carbon future – the UK's innovation challenge

This is the title of the report recently released by the UK Committee on Climate Change (CCC), an independent body established to provide the UK government with advice on setting "carbon budgets". The report categorises a range of key carbon abatement technology options according to their maturity and the UK's relevant manufacturing and R&D capabilities.

CCS for power generation falls into the "develop and deploy" category, with the CCC suggesting that the UK holds a comparative advantage in terms of manufacturing and R&D for technologies in this group. The CCC argues that current funding for coal and gas CCS is adequate but that some reprioritisation is required. The government should seek to increase its focus on the demonstration of gas CCS, which the CCC believes could be cost competitive in the UK under low and medium gas price scenarios.

The World Coal Institute is concerned that despite indicating that financial support for CCS is adequate, the report also suggests an emissions performance standard as a potential policy tool for ensuring that low carbon technologies are fully deployed in the power sector. This could be a risky move that threatens a shift of focus away from CCS development and a short term switch to unabated gas.

The CCC sees both coal and gas CCS as central to power sector decarbonisation through the 2020s and beyond. While the report acknowledges that the UK may not necessarily hold an advantage in terms of capture technology development compared to the US, it highlights the country's depleted oil and gas fields and experience with subsurface evaluation and geotechnical engineering as key factors for CCS suitability. However, the CCC identifies the current lack of integrated CO₂ transport and storage infrastructure as a potential barrier to the UK meeting its CCS potential and calls for the development of a new CCS infrastructure strategy.

New CCS competitions for this year

The UK's Department of Energy and Climate Change said it will launch the selection process for three new CCS demonstration projects "before the end of this calendar year," as part of the UK's goal to have four CCS demonstration plants up and running by 2025. The first competition was launched by the previous Labour government in 2007. Scottish Power's coal fired Longannet plant in Scotland and E.ON UK's coal fired Kingsnorth in Kent are the only two contenders left in that competition. DECC said these studies will be completed within 12 months, after which the final competition winner will be selected.

DECC said it had concluded that a single call for the three projects has advantages that outweigh the learning that may be gained from a phased approach involving sequential calls. It said it expected the CCS demonstration projects to have a size of "around 300-500MW." To limit costs, the projects should be large enough to achieve commercial scale demonstration, "but not oversized".

Germany agrees draft carbon storage law

The underground storage of CO₂ emissions could be a reality in Germany from 2017, after Berlin recently agreed a draft law to regulate CCS technology. Under the legislation, test sites will first be established before the government decides in 2017 whether CCS should be used as a long term environmental solution.

The German Energy and Water Association hailed the deal: "Now concrete CCS projects can soon be implemented." Opponents claimed the technology contained "incalculable risks." The draft law will now be considered by Germany's cabinet and must win parliamentary approval.

Power generator Vattenfall has been operating its €70M CCS pilot plant for more than a year, capturing 90% of its CO₂. Nestled in strip-mining country in eastern Germany, the plant could provide the prototype for the next generation of relatively affordable "clean" coal plants. However the plans have been frustrated by boisterous local opposition to its plans to pump CO₂ more than a kilometre underground into porous rock formations. Unnerved by the popular uprising, politicians have stalled on passing needed regulations and the delays have allowed the utility's competitors in the natural gas industry to buy up rare storage formations in Vattenfall's backyard. There have been assurances from geologists that escape is practically impossible, but other worries have been raised about stored CO₂ turning groundwater acidic and forcing real estate prices to plunge.

Dutch government on Numbys with CCS subsidy

The Dutch government is to spend up to €150M into a flagship CCS project that plans to store CO₂ beneath the North Sea. The Economic Ministry announced recently that it has agreed a programme of subsidies for the project, which aims to capture carbon emissions from an E.ON coal fired power plant in Rotterdam and transport it for storage in depleted gas fields off the coast. It said that the new financial support will be in addition to an €180M investment from the European Economic Recovery Plan, which was previously awarded to the pilot project.

The project has faced opposition from some environmental groups and local residents. Dubbed Numbys, (not under my back yard) they have voiced concerns about the possibility of the captured CO₂ leaking and warned that the project could divert



investment from other forms of low carbon technology.

However, the Dutch Economic Ministry insisted that it was fully committed to moving forward with the project, arguing that the country had the opportunity to establish itself as a world leader in CCS technology and build a carbon capture hub around the city of Rotterdam. "CCS is an important link in the transition towards a sustainable energy solution."

Duke Energy files cost update

Duke Energy Indiana filed testimony and exhibits with the Indiana Utility Regulatory Commission increasing the cost estimate for its Edwardsport coal gasification plant under construction in southwest Indiana. The 620MW project's scale and complexity has added approximately US\$530M to the previously approved \$2.35 billion cost.

The total cost of the Edwardsport IGCC project is estimated to be \$2.88 billion, including project financing costs. The total project, factoring in aspects such as engineering, construction and purchasing, is 57% complete. It is scheduled to be operating in 2012.

If approved, the increase in costs will add about 3% to the project's customer electricity price. Based on a customer's bill today, the project will result in an overall average 19% price increase phased in by 2013.

Regulators granted the company permission in 2007 to construct the technologically advanced clean coal power plant in Edwardsport and they approved the phase in of price increases associated with the project. The ability to phase in costs over time reduces the customer bill impact because it spreads out the increase and lowers financing costs. State utility regulators review and approve all plant costs before they are added to customer electricity rates.

Partnership on core sampling for sequestration

The Plains CO₂ Reduction (PCOR) Partnership, one of seven members of the US Department of Energy's Regional Carbon Sequestration Partnerships programme, has begun collecting core samples from a new characterisation well near Spectra Energy's Fort Nelson natural gas processing plant in British Columbia. Core sampling, along with a sophisticated well logging programme that the partnership is conducting, is an important step in proving the viability of carbon storage in brine-saturated formations.

The Fort Nelson project is on track to become one of the first commercial scale CCS projects in a saline aquifer in North America. With plans to inject over 2Mt per year of CO₂, the project will also be one of the largest carbon sequestration projects in the world. It is an international collaboration that includes Spectra

Energy, the Province of British Columbia, Natural Resources Canada, the PCOR Partnership, and the US DOE.

The PCOR partnership is planning a second test for the Williston Basin in North Dakota. The partnership is also conducting four smaller scale sequestration tests at locations across the Great Plains. All of the projects share the programme goal of developing the technology, infrastructure, and regulations to implement large scale CO₂ sequestration. As an added benefit, the projects are supporting more than 400 jobs that will continue through 2017.

Earlier phases determined that the PCOR partnership region has the geological potential to sequester more than half of the region's anticipated CO₂ emissions over the next 100 years. The PCOR Partnership is managed by the University of North Dakota Energy & Environmental Research Center and includes more than 80 public and private partners in nine states (North Dakota, South Dakota, Minnesota, Montana, Wyoming, Nebraska, Iowa, Missouri, and Wisconsin) as well as four Canadian provinces (British Columbia, Alberta, Saskatchewan, and Manitoba).

DOE awards post-combustion carbon capture project

The US Department of Energy has awarded a cooperative agreement to American Electric Power (AEP) for the Mountaineer Commercial Scale CCS Project to design, construct, and operate a system that will capture and store approximately 1.5Mt/year of CO₂. The project was a third round selection under DOE's Clean Coal Power Initiative, a cost shared collaboration between the federal government and private industry aimed at stimulating investment in low emission coal based power generation technology through successful commercial demonstrations.

The system will employ Alstom Power's chilled ammonia process (CAP) to capture at least 90% of the CO₂ from a 235MW stream of the 1,300MW Mountaineer power plant near New Haven, West Virginia. The captured CO₂ will be compressed and transported by pipeline to injection sites located on AEP property near the capture facility. The entire amount of captured CO₂ will be permanently stored in two separate saline formations located approximately 2.4km below the surface.

Successful demonstration of the CAP system coupled with sequestration will demonstrate the physical viability of sequestration in regional deep saline reservoirs. It will also reduce the risk associated with commercial deployment of CCS technology by reducing CO₂ capture costs compared to conventional post-combustion capture systems. The CAP technology was first pilot tested at a 1.7MW plant and then at a 20MW validation-scale facility.



The total project cost is approximately US\$668M, with the DOE cost-share limited to 50%. The project consists of four phases: project definition (phase I), design and permitting (phase II), construction and startup (phase III) and operations/demonstration (phase IV). Sequestration of 1.5Mt/year of CO₂ will begin in 2015, and the demonstration project will end in 2019.

Innovative drying technology for high moisture coal

An innovative coal drying technology that will extract more energy from high moisture coal at less cost and simultaneously reduce potentially harmful emissions is ready for commercial use after successful testing at a Minnesota electric utility. The DryFining™ technology was developed with funding from the first round of the DOE's Clean Coal Power Initiative (CCPI).

Great River Energy has selected the WorleyParsons Group to exclusively distribute licences for the technology, which essentially uses waste heat from a power plant to reduce moisture content in lignite coal. The first user of the technology will be the Spiritwood Station under construction near Jamestown, North Dakota.

In addition to using power plant waste heat to reduce moisture, DryFining also segregates particles by density. The end result is more energy can be extracted from the coal while simultaneously reducing emissions of mercury, sulphur dioxide and nitrogen oxides.

Great River Energy tested a 115t prototype dryer in the company's 546MW Coal Creek Station Unit 2 in North Dakota. Following a successful increase in boiler efficiency and reduction of emissions, Great River Energy expanded the project by building full scale dryer modules for the entire Coal Creek Station. The technology increased the energy content of the lignite from 14.4 to 16.5 MJ/kg, thereby reducing SO₂ and Hg emissions by more than 40%, NO₂ by more than 20%, and CO₂ by 4%.

These results are important to energy consumers because the US has about 280 power stations burning high moisture coal, generating more than 100,000MW of electricity, about one-third of the electric power generated by coal in the country.

NRG Energy's carbon capture and storage project

The US DOE announced that a project with NRG Energy has been selected to receive up to US\$154M, including funding from the American Recovery and Reinvestment Act. Located in Thompsons, Texas, the post-combustion capture and sequestration project will demonstrate advanced technology to reduce CO₂ emissions from existing plants. It will also assist with enhanced oil recovery efforts from a nearby oil field. The project was selected under the third round of the

Clean Coal Power Initiative, whose goal is to accelerate the readiness of advanced coal technologies for commercial deployment.

NRG will construct a 60MW (thermal) carbon capture demonstration facility at the company's WA Parish Unit 7 in Thompsons, Texas. The 6 year project will demonstrate an innovative integration of several important advances in CCS technologies, including:

- Fluor's advanced Econamine FG Plus carbon capture process, using several different novel amine solvents.
- Ramgen's advanced CO₂ compression system.
- The integration of highly efficient cogeneration to provide the necessary steam and electricity.
- Enhanced oil recovery sequestration in one of the Texas Gulf Coast oilfields near the Parish plant.

ZEP statement on CO₂ storage capacity

The European Technology Platform for Zero Emission Fossil Fuel Power Plants (ZEP) recently released a statement on the issue of CO₂ storage capacity. The statement was authored by a number of key geological experts and ZEP members in response to a recent publication by Ehlig-Economides & Economides 2010 which sought to demonstrate that CCS is not technically or economically feasible, based on a supposed lack of underground CO₂ storage capacity.

ZEP believes the E&E paper to be a serious misrepresentation of the scientific, engineering and operational facts surrounding CCS and have published this open rebuttal. They pointed to tests such as Norway's Sleipner project, which has buried millions of tonnes of CO₂ for more than a decade below the seabed of the North Sea. They said the most profound error is that the subsurface is not made of sealed boxes: instead there are many hundreds of metres of porous rock suitable for storage.

Ms Ehlig-Economides countered that Sleipner is not anywhere near the volumes needed for real operations of even a small power plant. A wider concern was raised about the cost of CCS: it is estimated to add about US\$1 billion to the capital cost of a power plant and cut efficiency by a quarter. The EU Energy Commissioner has said he doubted that the technology would take off in Germany, because of the difficulty forcing states to take and store CO₂ from each other.

Seven projects on advancing US coal research selected

Seven projects aimed at advancing coal R&D while providing research exposure to a new generation of scientists and engineers have been selected to participate in the US DOE's University Coal Research (UCR) programme. The projects aim to improve the basic understanding of the chemical and physical processes that govern coal conversion and utilisation, by-product utilisation, and technological development for advanced energy systems.



Managed by the Office of Fossil Energy's National Energy Technology Laboratory (NETL), the UCR programme is DOE's longest running student teacher research grant initiative. Since its beginning in 1979, nearly 1,800 students will have worked beside their professors in over 700 federally funded research projects, valued in excess of US\$132M. The seven projects chosen this year are valued at US\$2.4M. Each 36-month project will be conducted under one of three broad areas of interest: computational energy sciences; material science; or sensors and controls.

- Illinois Institute of Technology, Chicago - Developing a computational fluid dynamics model to perform simulations describing the heterogeneous gas-solid absorption/regeneration and water gas shift reactions for a regenerative magnesium oxide based process that removes CO₂ and enhances production of hydrogen in coal gasification processes.
- University of California, Merced — Apply models based on spectral properties of gases and solid particles (coal, ash, soot, bed material) to allow efficient high-fidelity, real time determination of radiative fluxes and sources in two phase coal combustion systems.
- Carnegie Mellon University, Pittsburgh — Develop high resolution methods, including an image based technique, for modelling the mechanical response of metallic alloys in three dimensions, including the design of novel refractory alloys such as those based on tungsten, niobium, molybdenum and chromium.
- University of Missouri, Kansas City — A systematic large scale computational study of advanced alloys based on refractory metals such as molybdenum that will have acceptable mechanical properties at high temperature will be conducted.
- Clemson University, South Carolina — The performances of materials with high melting temperatures, such as refractory alloys like tungsten, are often limited by properties at their grain boundaries (GB) and controlled by GB segregation. Studying this process in relation to embrittlement in tungsten for the mechanistic design of alloys to be used in coal fired power plants will help develop more efficient energy systems.
- West Virginia University — A collaboration with NexTech Materials Ltd will develop micro-scale chemical sensors and sensor arrays composed of nano-derived, metal-oxide composite materials to detect gases such as hydrogen and hydrogen sulphide within high temperature environments (>500°C).
- University of Pittsburgh — The production of functional metal oxide sensing materials integrated with high temperature optical sensor platforms for real time fossil fuel gas composition analysis.

Viability of turning coal into transportation fuel

A new report by the National Center for Policy Analysis (NCPA) explains that transforming coal into transportation fuel would be a safe way of producing cleaner transportation fuel while generating electricity and increasing US energy security.

The report said a number of nations already use the Fischer-Tropsch process of turning natural gas and coal into liquid fuels. Adopting this process in the US would have several benefits, including a reduction in health effects and premature mortality from air pollution, as well as a reduction of smog in big cities.

It also stated that price stability makes the coal-to-liquids (CTL) process a valuable option for certain transportation needs. Although the development of CTL offers extensive benefits compared to other alternative energy sources, there are roadblocks limiting the implementation of the process.

The report argues the government needs to understand that CTL will not move America completely away from fossil fuels. Rather, CTL offers greater energy security now, while non-fossil based transportation fuels are developed for the future.

USAF testing coal powered planes

Accelergy Company in Houston, Texas has begun production of jet fuel using a mix of Camelina oil and liquefied coal for evaluation by the US Air Force. The company says it has come up with a way to convert the coal into an economical and clear form of jet fuel.

The company will initially try to sell fuel to the US military and has also started to field inquiries from China and some commercial aircraft and engine manufacturers. Biomass can also be substituted for some of the coal in the recipe, depending on the desired characteristics of the final fuel.

The Department of Defense will likely set its standards for synthetic jet fuels in 2013 and the company claims that Accelergy's fuel will be able to meet those standards for a 100% synthetic jet fuel with high thermal stability, increased energy density, lower environmental impact and competitive costs.

Accelergy will use its coal-biomass-to-liquids technology at a pilot facility under construction at the Energy and Environmental Research Center, University of North Dakota. The process was fine tuned at ExxonMobil in the mid-1990s, turning coal or plant matter directly into a liquid. Accelergy's process does not convert coal into a synthetic gas before transforming it into a liquid. The company argues that eliminating gasification greatly reduces CO₂ emissions, as well as the total amount of coal (or biomass) consumed to produce liquids.



Martin Engineering improves railcar opener

Martin Engineering has introduced an improved version of its MARTIN® Railcar Opener to improve the unit's ability to stay in contact with railcar gates featuring rack-and-pinion opening mechanisms. Used to open the discharge gates on bottom-dump railroad hopper cars, the device will improve unloading efficiency and reduce safety risks for personnel.

The improved mechanism features pivoting wheels that allow the unit to roll along the track to maintain contact with the travelling capstan of rack-and-pinion on standard hopper car gates. Its adjustable cart base allows one worker to manoeuvre the opener through tight spaces. Unit height can be adjusted to meet the gate mechanism regardless of ground conditions at the unloading site.

Modular systems installed at Curragh mine

Modular Mining Systems Inc is currently installing the latest IntelliMine® asset management technologies at one of Australia's largest independent coal operations, Curragh Mine.

The installation at Curragh includes the DISPATCH® mine management system, the MineCare® maintenance management system, and the ProVision® machine guidance system. Curragh currently produces around 9Mt of coal per year, but with these new solutions, the mine expects to produce higher volumes with increased efficiency and safety.

Curragh selected these systems due to the company's flexibility to fill client-specific needs, as well as the features offered by IntelliMine technologies.

Technology to distribute mine productivity and cost reduction

3D-P and Active Control Technology announced an agreement in which ACT will distribute 3D-P's Intelligent Endpoint™ product line to the mining industry. This system provides machine diagnostics and key operating data to mine managers and works seamlessly with ActiveMine™, the premier wireless voice communication and tracking system for mines.

Under the agreement, Active Control gains new revenue streams through improved access to the surface mining market to help its customers improve productivity and reduce costs. For 3D-P, a leading provider of technology products for the mining industry, ActiveMine's wireless Wi-Fi data network effectively makes it possible to offer Intelligent Endpoints to underground mines for the first time, expanding the company's solutions portfolio.

Briquetting technology agreement for North America and China

Peabody Energy and White Energy Co Ltd announced the signing of an agreement to pursue development of a coal upgrading plant that would be sited at a Peabody operation in the Powder River Basin.

Under terms of the agreement, Peabody also has the first right to participate in new coal upgrading development projects that White Energy undertakes in North America and China. Peabody further has a right to acquire a nearly 15% equity interest in White Energy.

The coal upgrading plant would utilise White Energy's patented coal briquetting technology, a mechanical process that upgrades lower energy coals. The process increases the coal's overall energy content by approximately 35%. The resulting product is higher quality, more efficient and cleaner, with lower CO₂ and other emissions. The upgraded coal can be used interchangeably with high rank thermal coal for a number of applications, including power generation, industrial processes and conversion projects such as coal-to-gas and coal-to-liquids.

Peabody and White Energy are proceeding with engineering design and permitting activities for the first plant that are expected to require up to 24 months. The plant would be built in phases, with the first phase expected to produce more than 1Mt of upgraded coal per year. Subsequent phases could increase plant capacity ultimately to more than 20Mt annually. Peabody expects substantial global growth opportunities using this technology that will initially focus on applications in North America and China.

EVENTS

31 Aug 2010 – 3 Sep 2010, 6th international conference on advances in materials technology for fossil power plants, Santa Fe, NM, USA, Paula Foster, EPRI 3420 Hillview Avenue, Palo Alto, CA 94304, USA, Tel: +1 972 556 6509, Email: kqueen@epri.com, Internet: wguest.cvent.com/EVENTS/info/summary.aspx?e=25c519a2-fc77-45e3-8eaf-0e99f391e535ww:

1-2 Sep 2010, Mining NSW 2010, Orange, NSW, Australia, Informa, GPO Box 2728, Sydney, NSW 2001, Australia, Tel: +61 2 9080 4307, Fax: +61 2 9290 3844, Email: enquiries@informa.com.au, Internet: www.informa.com.au/iir-events/mining-events/mining-resources/metals-minerals/mining-nsw-2010

12-16 Sep 2010, 21st World Energy Congress: Montreal 2010, Montreal, PQ, Canada, World Energy Council, Montreal 2010, 740 Notre-Dame Street West, 8th Floor, Montreal, PQ, Canada H3C 3X6, Tel: +1 514 397 1474, Fax: +1 514 397 9114, Email: http://Internet: www.wecmontreal2010.ca/en/home.html

12-17 Sep 2010, Coal preparation 2010 conference on advancing coal preparation technologies, Cairns, Qld., Australia, International Longwalls News, PO Box 78 Leederville, WA 6902, Australia, Tel: +61 8 6263 9100, Fax: +61 8 6263 9148, Email: Confedit2010@acps.com.au, Internet: www.acps.com.au

21-22 Sep 2010, 2nd upgrading coal, Jakarta, Indonesia, Coaltrans Conferences Ltd., Nestor House Playhouse Yard, London EC4V 5EX, UK, Fax: +44 20 7779 8946, Internet:



www.coaltrans.com/EventDetails/0/3196/2nd-Upgrading-Coal.html

656 614, Fax: +44 1992 656 704, Email: MathildeS@pennwell.com, Internet: www.powergenasia.com

11-14 Oct 2010, 2010 Pittsburgh coal conference, Turkey, Istanbul, University of Pittsburgh, Swanson School of Engineering, 3700 O'Hara St., 1249 Benedum Hall, Pittsburgh, PA 15261, USA, Tel: +1 412 624 7440, Fax: +1 412 624 1480, Email: ipcc@pitt.edu, Internet: www.engr.pitt.edu/pcc/

17-19 Oct 2010, 30th anniversary Coaltrans world coal conference, Amsterdam, Netherlands, Coaltrans Conferences Ltd., Nestor House Playhouse Yard, London EC4V 5EX, UK, Fax: +44 20 7779 8946, Internet: www.coaltrans.com/Calendar.aspx

31 Oct 2010 – 3 Nov 2010, 2010 gasification technologies conference, Washington, DC, USA, Gasification Technologies Council, 4301 N. Fairfax Drive, Suite 300, Arlington, VA 22203, USA, Tel: +1 703 276 0110, Fax: +1 703 276 0141, Email: info@gasification.org, Internet: www.gasification.org/conferences/annual_conferences.aspx

2-4 Nov 2010, Power-Gen Asia, Singapore, Singapore, Mathilde Sueur, PennWell UK Office, Warlies Park House, Horseshoe Hill, Upshire, Essex EN9 3SR, UK, Tel: +44 1992

30 Nov 2010 – 2 Dec 2010, Asia Pacific coal outlook conference 2010, Bali, Indonesia, Letoya Anderson, The McCloskey Group, Unit 6, Rotherbrook Court, Bedford Road, Petersfield GU32 3QG, UK, Tel: +44 1730 265095, Fax: +44 1730 260044, Email: letoya.anderson@mccloskeycoal.com, Internet: www.conf.mccloskeycoal.com/story.asp?sectioncode=8&storyCode=69464

1- 2 Dec 2010, Asia Pacific coal outlook conference 2010, Bali, Indonesia, Letoya Anderson, The McCloskey Group, Unit 6, Rotherbrook Court, Bedford Road, Petersfield GU32 3QG, UK, Tel: +44 1730 265095, Fax: +44 1730 260044, Email: letoya.anderson@mccloskeycoal.com, Internet: www.mccloskeycoal.com/conferences

11 – 13 Apr 2011, 3rd international conference on energy and sustainability, Alicante, Spain, Irene Moreno Millan, Wessex Institute of Technology, Ashurst Lodge, Ashurst Southampton, SO40 7AA, UK, Tel: +44 238 0293223, Fax: +44 238 0292853, Email: imoreno@wessex.ac.uk, Internet: www.wessex.ac.uk/11-conferences/energy-2011.html

FEEDBACK

*This e-Newsletter is published for the Coal Association of New Zealand Inc. by CRL Energy Ltd.
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