



A Prosperous New Year to All!

What's news?

COAL NEWS 1

New Zealand 1

- Taranaki coal seam gas exploration continues 1
- Rotowaro output maintained despite dispute 2
- L&M to start Ohai drilling 2
- Comet Ridge increasing its coal seam gas search 2
- Taranaki firm working for Queensland CSG project 2
- Lanzatech: first coal to biofuel project 3
- Air quality standards transition more realistic 3

INTERNATIONAL NEWS 4

Australia 4

- Adani to invest in developing coal project 4
- Launch of coal freight IPO 4
- Chinese firms ink deal to tap coal reserves 4
- Coal miner seeks to raise funds in IPO 4
- Approval for Centennial Coal takeover 5
- Coal company boasts carbon credits 5

China 5

- New highway for coal transport 5
- Legend to invest in coal chemical industry 5
- Development of big north-west coal resources 6
- World's largest clean coal conversion 6

India 6

- Reliance pact just the first big China deal 6
- Advanced boiler for coal plants 6
- NTPC aims to produce coal from mine 7
- ICVL looks for overseas coal assets 7
- Government efforts to be stepped up for coal 7

Indonesia 7

- Coal FE starts production at mine 7

Kenya 8

- Seeking partners for coal projects 8

Mongolia 8

- Hunnu Coal to fast track Mongolia coal projects 8

Philippines 8

- Power firms up plans for Davao coal plant 8
- San Miguel looks abroad for oil, coal projects 9

Russia 9

- Bid for Kolar coal mines 9

South Africa 9

- Sasol puts coal-to-liquid plant on back burner 9
- Cabinet approves draft carbon tax plan 10

USA 10

- New rule on coal dust 10
- Proposal to restrict disposal of coal fly ash 10
- TVA's plan includes less coal, more conservation 10
- Conventional coal plants expanding 11

TECHNOLOGY & OTHER NEWS 11

- New Queensland coal fired power stations must have retrofit ability 11
- CO2CRC Developments 11
- South Korea aiming for two CCS plants by 2020 12
- Emission cuts hard if CCS not readily available 12
- Slow progress on clean coal projects 12
- Shenhua Group prepares pilot CCS facility 13
- UK coal firm Powerfuel planning CCS plant calls in administrators 13
- Shell's Barendrecht CCS project cancelled 13
- World Bank invests record sums in coal 14
- CCS technology crucial even as US cuts coal use 14
- B&W sparks cleaner coal process 14
- Finnish Fortum to scrap CCS project 15
- Coal - a new solution to fuel problems? 15
- Fast fit weighing system for coal wagons 16
- World first to use coal-based jet fuel at airshow 16
- Successful recovery of coal from sludge 16
- Simulator facilitates clean-coal plant training 16
- Biogenetic methane enhancement from coal 17
- Quick fix for coal mine methane emissions 17
- Converting carbon residue from coal to oil 18

EVENTS 18

FEEDBACK 18

DISCLAIMER 18

COAL NEWS

New Zealand

Taranaki coal seam gas exploration continues

Solid Energy is continuing its Taranaki CSG work with a widely spaced exploratory drilling programme in the northern part of the Stratford District and western part of Ruapehu District.

Seven exploration holes are being drilled in an area from Tatu through to Whangamomona. The company describes the work as similar to that carried out in the north Taranaki to better understand the location of coal resources and potential for CSG. This round of exploratory drilling includes measuring CSG content and permeability; that is the coal's ability to release the methane gas that occurs naturally in coal seams.

Six similar exploration holes were previously drilled by Solid Energy in the Taranaki near Mt Damper, Waitaanga, and around Tahora and Tangarakau over the last eighteen months. Drilling may reach depths between 800–1500m. Apart from one well near Whangamonona, wells will be fully cemented and areas rehabilitated once they have been drilled and tested.



Water samples will be collected from the Whangamonona well to begin preliminary work on managing the water produced in the CSG production process. A truck mounted drill rig will carry out the work with the permission of individual landowners and consents from the local and regional councils.

Solid Energy has been investigating CSG as a source of energy since 2005. It has successfully generated electricity using a gas generator from a four well appraisal site in the Waikato, the first time electricity has been generated this way in New Zealand. Individual wells are connected with low pressure underground pipelines. Each well can last 10 to 15 years.

Currently Solid Energy's focus for CSG in the Taranaki remains on exploration. Any development of the Taranaki programme to appraisal level will depend on results of ongoing exploration over the next two years.

In August, Solid Energy said its CSG prospects in the Taranaki region looked larger and easier and development may accelerate and eventually overtake work the company is already doing at Huntly. The company aims to produce about 30 PJ of gas a year by 2020, most of it from underground coal gasification. The balance of about 10 PJ is the company's forecast CSG production from Huntly.

Crown Minerals estimates the in-ground coal resource in the region at about 380Mt, extending from Mokau in the north-west to Tangarakau in the south. Most of it is in the Mokau field north of Solid Energy's current drilling programme. The region contains at least 11 coal seams up to 3m thick.

Rotowaro output maintained despite dispute

Solid Energy's production rates at its Rotowaro mine, a key fuel source for the Huntly power station, are being maintained with a little less than a year remaining in its mining contract with HWE Mining. The two parties were in court earlier this year after HWE reduced staffing and equipment at the site south-west of the power station. Solid Energy said mining conditions are difficult (with old underground workings and weak rock and clay) and both parties have been "under pressure" for several years. A change of operator is likely late in 2011.

Rotowaro is usually Solid Energy's biggest producer after Stockton. It produced 1.34Mt in the year ended June 30. Production from Rotowaro, which also helps supply the Glenbrook steel mill, has declined from a peak of 1.58Mt in 2007.

Sales to Genesis for power generation fell to 732,000 tonnes last year from 810,200 a year earlier. Long term contracts have also been re-profiled to extend their term, but at a reduced annual rate of between 700,000 and 900,000 tonnes. The previous contracts would have seen volumes peak at about 1.7Mt around 2013.

The generator is considering reducing its use of coal to lower emissions and reduce operating costs at the 27 year old power station. It is considering taking one 250MW unit out of service by the end of 2012 and a second late in 2014.

L&M to start Ohai drilling

L&M Energy expected to start drilling the first well for its Ohai CSG production pilot in December. Site construction is underway and work will begin shortly preparing surface casing to a depth of about 100m. The pilot well will be drilled early January to a depth of about 750m. Commercial discussions are continuing with large industrial users regarding potential off-takes agreements.

Comet Ridge increasing its coal seam gas search

Comet Ridge Ltd is increasing its aerial search for CSG deposits on the West Coast and in the northern Waikato. The company says between 1,000 and 2,000 km² will be surveyed by Perth based Fugro Airborne Surveys.

The programme, believed to be worth about NZ\$1.3M, is the second part of a five phase process used to establish the viability of potential CSG resources, which are increasingly being explored as a new source of natural gas.

Preliminary aerial surveys were conducted in late 2009 and the first drilling of identified targets is expected to commence in the second half of 2011.

Taranaki firm working for Queensland CSG project

Horizon Energy Services of New Plymouth is providing production operations personnel for a central Queensland CSG project. For several months Horizon has been providing team leaders, operations people and mechanical technicians

A Prosperous New Year to All!



to WestSide Corporation Ltd for its Meridian CSG project. The company now employs about 30 people doing a variety of jobs domestically and internationally.

WestSide operates the Meridian SeamGas CSG fields, west of Gladstone in Queensland's Bowen Basin, and the fields currently produce about 4 PJ/yr of gas. It holds a 51% interest in Meridian SeamGas, with Mitsui E&P Australia Ltd holding the remaining 49%.

Recently, WestSide and Mitsui began drilling the first of a series of wells under a A\$14.5 M first stage of a work programme designed to lift field production and increase reserves.

WestSide also operates - in conjunction with Queensland Gas Corporation - a 50/50 joint venture exploration and appraisal programme elsewhere in the Bowen Basin - at the Paranui, Tilbrook, Mount Saint Martin and Bald Hill sites and it is conducting pilot evaluation programmes at Paranui and Tilbrook.

In addition, WestSide also has a position in a second part of Queensland, the Galilee Basin, where it holds two leases and expects to commence exploration activities there later this year.

Lanzatech: first coal to biofuel project

LanzaTech and Henan Coal and Chemical Industrial Corporation (HNCC) of China have signed a memorandum of understanding (MoU) for the production of fuels and chemicals.

Ethanol fuels and chemical products will be produced through the integration of coal gasification and LanzaTech's biological fermentation process.

A separate three way letter of intent was also signed regarding the establishment of a Bio Energy Research Centre for the development, pilot production and commercialization of the technology to change coal derived synthesis gas to ethanol fuels and chemicals.

The research centre, supported by multiple research institutes, will focus on developing important complementary process technologies, like product separation, water conservation and process integration. The research centre will also focus on developing other high value added technology and products.

LanzaTech has already successfully proven that its proprietary gas fermentation platform can be used to convert biomass syngas at laboratory scale. It is envisaged the demonstration facility will be operational by the second half of 2011.

Dr Jennifer Holmgren, LanzaTech's CEO, said the Henan MOU demonstrates the continued commitment of China to the development and usage of clean energy. Early adoption of these technologies will enable China to become a leader in green energy manufacturing and use.

LanzaTech said the partnership with Henan Coal and Chemical and the Chinese Academy of Sciences will help reduce the CO₂ footprint of China's coal industry.

Air quality standards transition more realistic

The National Environmental Standard for fine particulate matter in ambient air was due to be introduced in 2013. The Minister for the Environment has delayed the deadline until 2018 in acknowledgement of calls from industry groups and regional councils that the 2013 date was unrealistic. The Minister told Parliament that 233 businesses employing more than 17,000 staff stood to be adversely affected because air discharge resource consents could not be issued or renewed if an airshed was in breach of the standard. This would be unfair because those businesses were responsible for less than 10% of the air pollution in the affected airsheds.

As an alternative policy, the government is subsidising programmes to shift home heating away from burning coal and wood. Alexandra, Christchurch and Rotorua are among key areas of concern, together with parts of Dunedin, Nelson and the West Coast.

A Prosperous New Year to All!



INTERNATIONAL NEWS

Australia

Adani to invest in developing coal project

Adani is committed to invest A\$6.9 billion in Australia for developing mine, rail and port projects in its Galilee Basin coal mine in Queensland to produce up to 60Mt/year of coal at its peak.

The acquisition is one of the largest coal mine deals by an Indian group. The company bought the coal mine in a cash and royalty deal in August.

The investment represents the largest ever Indian investment in Australia and an important benchmark investment in low rank thermal coal assets.

The company recently opened its office at Brisbane, which it considered as a milestone towards its goal of mining 200Mt/annum of coal, generating 20,000MW of power and moving 200Mt of cargo through its ports by 2020.

It was also awarded preferred proponent status for developing the Dudgeon point terminal in Mackay, Queensland, which gives the Adani Group the right to develop a coal terminal with an annual capacity of 30-60Mt. Sources earlier said the group was in talks with Coal India Ltd to take on board the state owned company as a partner for developing the Australian mines.

Launch of coal freight IPO

Queensland plans to launch an initial public offer of shares in its coal freight business, defying opposition from major miners to issue one of the country's biggest IPOs in a decade.

The Queensland government, which is selling off up to 75% of its QR National business to shore up its budget, announced the IPO as it kicked off a pre-marketing campaign for retail investors.

Coal miners such as BHP Billiton, Rio Tinto and Xstrata had opposed the IPO, saying the newly privatised business would have too much control over their industry.

Queensland is selling assets to prop up finances after the recession crimped government revenue. The State Premier has stated she will put other assets up for sale, including a road network, a coal terminal and a port.

Chinese firms ink deal to tap coal reserves

Two Chinese coal companies have teamed up to explore and develop coal resources in an area in Australia that has forecast reserves of 10 billion tonnes.

China Coal Geology Engineering Corp and Wanbei Coal-Electricity Group Co Ltd, based in East China's Anhui province, inked an agreement for the project. The two companies will carry out a five year exploration and development programme in the area in Queensland.

The deal is in line with domestic coal companies' quickening pace in venturing overseas. The timing now is appropriate for them to expand overseas, analysts said.

Chinese companies can enjoy more reasonable prices in making overseas deals, as international coal prices have dropped a lot after the economic recession.

The volume of China's coal imports more than tripled in 2009 from a year earlier as the country's economic stimulus package boosted demand

Coal miner seeks to raise funds in IPO

Universal Coal, a coal developer owning projects in South Africa, recently opened its IPO to raise up to A\$20M, before listing on the ASX. Universal's IPO and share placement is intended to provide funds towards the start of initial mining at Kangala project, in the Witbank coalfields, the progressing of feasibility studies at Roodekop and Brakfontein, and completing further exploration at the company's coking coal projects.

A Prosperous New Year to All!



The company has over 726Mt of Joint Ore Reserves Committee-compliant coal resources across the Kangala, Roodekop and Brakfontein thermal coal projects and the Berenice and Somerville coking coal projects, with a combined total exploration target of over 1000Mt of coal.

Universal was recently granted a mining right over the Kangala project and intends to start mining in early 2011. The A\$12.5M Kangala mine would produce 3Mt a year of domestic grade thermal coal.

Universal's production would be increased to 6Mt a year within three years, as the company's Roodekop and Brakfontein mines became operational.

Approval for Centennial Coal takeover

The Australian Foreign Investment Review Board has approved the A\$2,500M takeover of ASX-listed Centennial Coal by Asian coal miner Banpu.

Banpu unveiled its share offer in July, which represented a premium of 40% to the closing price before the bid. The takeover offer was subject to a 50.1% minimum acceptance offer as well as regulatory approvals.

Centennial Coal supplies thermal coal to domestic and export markets, and has ten mines in New South Wales, which produced a combined 15Mt of coal in 2009.

Banpu is listed on the Thailand Stock Exchange and has a diverse portfolio of coal mining and power assets in China, Thailand and Indonesia. The company produced 21Mt of coal in 2009.

Coal company boasts carbon credits

The world's sixth largest coking coal company says it's well placed to become the only carbon positive coal company in the world.

Gujarat NRE operates two mines in the southern coalfields of NSW near Wollongong, exporting coal to its plant in India where it is used for steel making.

The company said wind power is going strong and the company is building new plants to re-use waste heat from production to produce clean power. "We have 240MW of plant, which are entitled to carbon credits because of no emission, and 87MW of wind power, against 6Mt of coking coal production. So whatever fugitive emissions there are from coal mining are more than offset by the amount of carbon credit that the company will be generating."

China

New highway for coal transport

A new highway linking China and Mongolia is expected to be jointly built by the two countries with a total investment of US\$375M.

The new highway is planned to be 245km in length and will run from Mongolia's southwest Omnogovi Aymag province to Ganqimaodu, a border town in China's Inner Mongolia autonomous region.

Two firms from China and Mongolia plan to set up a joint venture, which will be the main builder of the highway, scheduled to be completed in two years.

The new highway was expected to improve coal transportation between the two countries, as well as promote economic development in China and Mongolia.

Legend to invest in coal chemical industry

Legend Holdings Ltd has signed an agreement with Zaozhuang, eastern China's Shandong province, to invest in building a chemicals production facility there.

The investment will be in two stages over the next five years. First part will be to develop an integrated coal chemical production chain and the other part will be invested for expanding production capacity and developing fine chemicals and new materials industries.

The two parties will set up a joint venture as soon as possible to implement the agreement, according to the report.

A Prosperous New Year to All!



Legend confirmed the coal chemical industry will be a key investment area for the company. This is another large project after Legend cooperated with Enn Group and China Oceanwide Holdings Group in 2007 to build a chemical project in the province's Wenshang county.

Development of big north-west coal resources

China would become a coal exporter once more if the country decided to develop large coal resources in the north-west Xinjiang province. This would depress international coal prices, and have a knock-on effect on the price of gas, IEA chief economist Fatih Birol told the World Energy Congress in Montreal.

"These coal reserves are about 40% of total Chinese coal reserves but less than 5% of production," he said, adding that the government was considering developing large mines and coal-fired power plants in the region." In 2000, China was consuming energy equal to half of what the US consumed. According to IEA estimates, it surpassed the US for the first time last year, though China disputes this.

China became a net importer of coal for the first time last year, importing 130Mt of the fuel – almost double the volume for 2008. During the same period, coal exports fell 50%.

World's largest clean coal conversion

As the world's largest coal producer and consumer, China is seeking clean uses of its huge coal resources and industry insiders forecast it is expected to develop its coal conversion industry into the world's largest by 2020.

"China's capacity of coal liquefaction projects would hit the equivalent of 20Mt of oil, that of coal-to-gas would reach 50 billion m³, and coal-to-chemical totalled 10Mt of oil equivalent," according to China Shenhua CTL & CTC Research Institute at an energy forum in Taiyuan, capital of Shanxi Province.

The scale would then become the largest in the world, while some of the technologies would be the top level in the world. So far, China has finished construction on 8 pilot clean coal conversion projects. Annual coal liquefaction capacity stands at 1.68Mt, and that for coal-to-gas 15 billion m³. Capacity for coal-to-olefin stands at 1.7Mt.

India

Reliance pact just the first big China deal

Reliance Power's US\$10 billion pact with Shanghai Electric Group Co for the supply of power generation equipment and related service contracts is the largest China-India power deal but it isn't likely to be the only one by an Indian utility.

India's drive to fix its power deficit began in earnest just four years ago. India wants to boost electricity output by 60% in the five year span ending March 2012 to alleviate severe shortages and help fuel its rapidly growing economy. However, it doesn't have enough of its own equipment or specialist engineers to achieve that goal. India has only five manufacturers of equipment for large thermal power plants and that's not enough to meet the demand from power producers.

Low cost Chinese equipment and contractors have proved to be the alternative. Chinese companies now supply about a quarter of the equipment for new power capacity that is being added in India. This explains Reliance Power's deal with Shanghai Electric, which comes despite India's recent efforts to rein in its growing reliance on Chinese equipment.

India's heavy industries minister has said he wants government approval to impose safeguard duties on the import of Chinese power equipment in a bid to protect the interests of state-run Bharat Heavy Electrical Ltd. Of the five manufacturers based in India, only the 40 year old BHEL doesn't have a joint venture with an overseas equipment maker. Current orders mean the plant is booked out for at least the next three years despite attempts to increase manufacturing capacity and the other local manufacturers are in similar positions.

Advanced boiler for coal plants

The Indira Gandhi Centre for Atomic Research (IGCAR) in Kalpakkam has decided to design and develop a 800 MW advanced, ultra super-critical boiler for use in coal-fired power plants.

IGCAR has signed a Memorandum of Understanding with power equipment manufacturer BHEL and power generating company NTPC. IGCAR will design and develop the advanced, ultra super-critical boiler that can operate at 350 bar

A Prosperous New Year to All!



pressure and 700°C. BHEL will manufacture the boiler and other equipment needed for power generation and NTPC will operate the plant.

A representative said the three organisations are joining hands because there is a national challenge. "Development of this technology is one such challenge which when it becomes successful will result in huge savings for India."

Most of the power project promoters have opted for imported super critical boilers (operating at 250 bar and 600°C) paying high prices.

NTPC aims to produce coal from mine

NTPC Ltd of India aims to produce coal from its captive mine in Jharkhand (eastern India) in the next financial year. The company has environment clearance and hopes to produce coal from Pakri Barwadhi (in Jharkhand) in 2011-12.

NTPC has exclusive exploration rights in five mines in India and joint rights with Coal India Limited in two others in Jharkhand. NTPC aims to lock in fuel supplies to feed its rising generation capacity, currently at 32.2GW and expects it to rise to 75GW by 2017.

ICVL looks for overseas coal assets

International Coal Ventures Ltd, the special purpose vehicle floated by five state-owned firms to scout for coal assets abroad, is talking to mine owners in Uzbekistan, Indonesia and Australia even as tight supplies of coking coal used by steelmakers has lengthened negotiation time.

Jointly owned by two steelmakers, a utility firm and a coal mining company, ICVL is taking no chances after having lost a prospective bid for a mine in Australia at the very last stage.

ICVL recently aligned itself with Rail India Technical & Economic Services (RITES), an engineering consultancy under the Ministry of Railways, to jointly develop properties in Indonesia and Mozambique. As part of this, RITES will prepare the feasibility report on setting up the infrastructure for transporting coal mined by ICVL.

Government efforts to be stepped up for coal

The Minister of State for Coal said the government is actively considering enhancing the borehole density for coal exploration from the existing 1.5/km² to 15-20 boreholes/km² without the need for seeking forestry clearance in order to meet the sharply rising coal demand.

Expressing concern over increasing demand and supply gap in energy sector, Jaiswal said coal production is hovering around 530Mt and the country is importing about 67Mt of coal.

He said that there are long standing issues, which need to be addressed to augment domestic coal production and to facilitate large scale imports to supplement the efforts of domestic producers to make available required quantities of coal.

The major constraints associated in 'Accelerated Development of Coal Blocks' are land acquisition and related issues, forestry and environmental clearances, inadequate evacuation infrastructure in major coalfields and law and order problems, particularly in some States. 26 coal blocks have commenced production and their contribution is expected to be around 104Mt in the next five years. There are constraints in the way of increased production from captive blocks, including delays in obtaining forestry clearance, land acquisition, rehabilitation etc., according to the Minister.

Indonesia

Coal FE starts production at mine

Coal FE Resources has started production at its Adabi coal project with a trial delivery shipment of 50,000 tonnes in October. The miner said that once the trial shipment has been completed, a long-term supply agreement would be negotiated.

The Adabi coal project, covering 1017 ha of land in the Kutai Kartanegara province, East Kalimantan, is estimated to host around 34.5Mt of coal, of which 27.5Mt are in the measured category and the remainder in the indicated category.

A Prosperous New Year to All!



Kenya

Seeking partners for coal projects

Kenya intends to partner with international companies in an effort to accelerate coal exploration and development.

The Kenyan government has created four coal blocks in the Mui basin, some 180km north-east of Nairobi, which it intends to lease to prospective investors. The four blocks cover an area of 490 km².

"Government intends to concession coal blocks within the Mui basin for the purpose of exploration, exploitation and development," according to the Ministry of Energy.

A total of 62 wells have been drilled in the Mui basin to depths ranging from 75 to 445m, with the thickness of the coal seams intercepted varying from 0.3 to 13m. Analysis shows the coal is sub-bituminous, bituminous and lignite, with an average calorific value of 15 MJ/kg.

This is the third time the Kenya government is seeking private partners for resource projects. Two previous attempts were not successful.

Mongolia

Hunnu Coal to fast track Mongolia coal projects

Explorer Hunnu Coal said that it was looking to raise up to A\$40M to accelerate its Mongolian coking and thermal coal projects. The company said the successful completion of the placement will place the company in a strong financial position to accelerate its aggressive exploration programme.

Funds raised in the placement would also be used to calculate a Joint Ore Reserves Committee resource at both the Tsant Uul coking coal and the Unst Khudag thermal coal projects. Both these projects would also be fast tracked for development.

Hunnu Coal was aiming to become a major force in the exploration and development of coking and thermal coal deposits in the South Gobi and Middle Gobi coal provinces. The company has set a timetable of developing three coal mines in Mongolia within the next four years.

In August, the coal developer started trial mining at the Unst Khudag mine. The trial opencut operation would produce an initial supply of coal for bulk test work, and for delivery to potential offtake partners for independent test work.

Hunnu said, at the time, that the trial mine would also deliver important geotechnical and hydrological data, which would be used in the modelling of a much larger upscaled opencut mine.

Philippines

Power firms up plans for Davao coal plant

Aboitiz Power Corp has firmed up its plans to put up a 150MW coal fired power plant in Davao to help augment Mindanao power supply.

"Mindanao's heavy dependence on hydropower has seriously eroded power supply reliability as it is highly vulnerable to weather conditions. Generating power with the use of coal will significantly reduce our dependence on hydropower," according to Aboitiz Power.

The company plans to source the coal to be used as fuel for the plant from Kalimantan, Indonesia because Davao City is relatively close to the area.

There will also be no need to build new and long transmission lines to deliver power from the source because the source is already in Davao City itself.

It is projected that the shortfall between power supply and demand in the region from 2010 to 2014 will reach 484MW.

Aboitiz Power said it wants to be part of the solution to the Mindanao power crises by building a circulating fluidised bed coal plant within Davao City. Since timing is critical, the company is willing to take the risk and build this plant without bilateral contracts with wholesale buyers of electricity, adding that a coal plant would be the best source of electricity from the standpoint of reliability, affordability, and safety.

A Prosperous New Year to All!



Aboitiz said that among the projects the company has lined up for construction between 2011 and 2015 are a 300MW in Subic and two coal plants in Mindanao.

Aboitiz said that company plans to put up 700MW of new capacity in the next five years, largely from new coal fired plants.

San Miguel looks abroad for oil, coal projects

San Miguel Corp said it is looking outside its Philippine base for substantial investments in coal, oil and natural gas as part of its move beyond its brewing roots.

The company is conducting an ongoing evaluation of the viability of investing in coal mines, which have potential mineral reserves of 500Mt and oil and natural gas fields.

All three prospects are located abroad, it told the Philippine Stock Exchange in a disclosure, which did not name the countries or the prospects.

San Miguel, one of the Philippines' biggest companies, announced in July that it would sell about US\$1.63 billion worth of shares to fund new investments.

San Miguel is Southeast Asia's largest food and beverage outfit and is known particularly for its beer, but it has moved aggressively into heavy industries in recent years.

This has included investments in mining, power generation and distribution, oil refining and road-building.

Russia

Bid for Kolar coal mines

NMDC Ltd of India has moved a step closer to acquiring four coking coal mines in North Russia, controlled by Russian billionaire Mikhail Prokhorov.

According to reports, NMDC may end up paying US\$400M for the mines in a deal expected to be officially sealed by the end of the year.

Intergeo, a new mining subsidiary of Russia's Onexim group private equity fund owned by Prokhorov, was preparing to sell the Yakutia based Kolmar Coal Company in northern Russia to NMDC for at least \$400M, almost \$100M more than the company paid for the asset.

When completed, the buy-out would have NMDC ensuring raw material supplies for its two planned steel plants in India. NMDC had earlier confirmed that talks were on, but said that the Kolmar's coal mines were one of the many coal assets that NMDC was looking at. The public sector company has been trying to acquire mining assets overseas for the last few years.

Called Kolmar mines, the four Russian mines are estimated to have about 400Mt of coal reserves in Siberia's Yakutia region.

South Africa

Sasol puts coal-to-liquid plant on back burner

Sasol's plan to turn coal into fuel in the Waterberg could be losing steam as the petrochemicals producer announced it would delay the progression of Project Mafutha to the feasibility phase. The group plans to test bulk samples of Limpopo coal at its Secunda facility next year.

Sasol, which produces roughly a quarter of South Africa's liquid fuel, blamed the delay in moving to the feasibility stage on the lack of clarity about large scale coal gasification tests, as well as the provision of a commercially viable CCS solution.

It said more certainty was also required about the government's prioritisation of South Africa's mega energy projects, and this was expected towards the end of the year.

A Prosperous New Year to All!



Because of its potential for heavy carbon emissions, Mafutha would need to integrate CCS at the outset. But the technology is expensive, while carbon sequestration options in South Africa are unclear.

Sasol has indicated the project would require extensive government support via a public-private partnership. The state has endorsed state-owned PetroSA's 400,000 barrel-a-day oil refinery planned at Coega.

Cabinet approves draft carbon tax plan

South Africa has approved a draft carbon tax policy to address climate change and the proposed tax will soon be released for public comment on its environmental and economic rationale, as the government seeks to influence consumer and producer behaviour through a pricing mechanism.

Three carbon emissions tax options are being considered by government: a direct tax on actual measured emissions, a fossil fuel input tax based on carbon content and an output tax that could be applied to emitters where fuel is burnt.

Power utility Eskom and petrochemicals group Sasol last year topped a list of the country's highest emitters, responsible for 220 and 70Mt of CO₂ respectively.

USA

New rule on coal dust

The Obama administration has issued an emergency order to underground mine operators to strengthen a crucial safety measure to prevent explosions of coal dust, a highly flammable substance discharged from drilling that has been blamed for deadly mine disasters for decades.

Investigators say coal dust likely was a key factor in the April 5 explosion at the Upper Big Branch Mine in Raleigh County, West Virginia, that killed 29 people, considered the worst US coal mining disaster in 40 years.

The emergency order, issued by the US Mine Safety and Health Administration, will force mine operators to increase the amount of incombustible "rock dust" (powdered limestone) that is applied across walls, floors and all other surfaces of their underground operations.

Mining companies were required to apply enough of the incombustible material so that 65% of the particles suspended in the air pumped out of the mine was rock dust. But five years ago the National Institute for Occupational Safety and Health started testing the durability of that level and found that modern drilling techniques were shearing the coal into a much finer and more dangerous dust, which, if ignited, can impact a much broader area underground.

Proposal to restrict disposal of coal fly ash

A federal proposal that would impose tough new controls on coal fly ash disposal was endorsed by environmentalists and people living near ash impoundments at a US Environmental Protection Agency public hearing in Pittsburgh.

The EPA is proposing to federally regulate coal ash for the first time in response to risks to groundwater and drinking water supplies from toxics leaching from impoundments and dry landfills and recent structural failures. In 2008, the collapse of a Tennessee Valley Authority ash impoundment near Kingston, Tenn., flooded more than 140ha of land with coal ash slurry and flowed into the Emory and Clinch rivers.

The EPA will select one of two rule proposals. One, Subtitle C, would designate coal fly ash as a "special waste" but regulate it under federal hazardous waste rules, phase out use of existing wet slurry impoundments and ensure the structural integrity of the impoundments through increased inspection and monitoring. The second proposal, under Subtitle D of the federal Resource Conservation and Recovery Act, would regulate fly ash as a non-hazardous waste and provides for no federal enforcement. It would be enforced through citizen lawsuits.

TVA's plan includes less coal, more conservation

The Tennessee Valley Authority could shut down more than one-third of its coal fired power plants and add more nuclear, gas and renewable generation to make up for any shortfall in power generation.

In a draft of its integrated resource plan, which covers the next 20 years, TVA planners also said the utility could cut the growth in its peak power demand by up to 6,000MW (or more than 15%) by time-of-day pricing, energy audits and incentives for power conservation.

A Prosperous New Year to All!



The preferred choices emerging from TVA's most comprehensive plan in 15 years suggest that the nation's biggest government utility should limit the use of coal, which now fuels more than 60% of TVA's power generation.

Conventional coal plants expanding

Utilities across the country are building dozens of conventional coal plants that will cement the industry's standing as the largest industrial source of greenhouse gases for years to come.

An Associated Press examination of US DOE records and information provided by utilities and trade groups shows that more than 30 traditional coal plants have been built since 2008 or are under construction.

The expansion, the industry's largest in two decades, represents an acknowledgment that clean coal technology is still a long way from becoming a reality and underscores a renewed confidence among utilities that proposals to regulate carbon emissions will fail. The Senate in July scrapped the leading bill to curb carbon emissions after opposition from Republicans and coal-state Democrats.

Utilities say they are clinging to coal because its abundance makes it cheaper than natural gas or nuclear power and more reliable than intermittent power sources such as wind and solar. Still, the price of coal plants is rising and consumers in some areas served by the new facilities will see their electricity bill rise by up to 30%.

TECHNOLOGY & OTHER NEWS

New Queensland coal fired power stations must have retrofit ability

Queensland will ban new coal fired power stations except for those that can be fitted with clean coal technology. The move institutionalises the technology in the nation's major coal-producing state. There are four new coal-fired power stations planned for the eastern seaboard - one each in Queensland and Victoria, and two in NSW - and all have provision for clean coal technology.

CO2CRC Developments

Over 30 CO2CRC oral and poster presentations were made at the bi-annual International Conference on Greenhouse Gas Control Technologies (GHGT), now in its tenth year, this time in Amsterdam, Netherlands. The topics cover the full chain of CCS technology development and serve as a useful summary of the centre's activities. In addition, Dr Peter Cook, Chief Executive of CO2CRC, was awarded one of two 2010 Greenman Awards by the organisers, the International Energy Agency Greenhouse Gas R&D Programme, in recognition of his longstanding contributions to CCS development.

One paper gave an overview of the progress and outcomes of the CO2CRC Otway Project. As Australia's only active storage project, the Otway Project has provided practical experience for future commercial projects, built community confidence in CCS technology and influenced early CCS regulation and legislation in Australia. It also described plans for Stage 2 of the project and how it will use the existing research infrastructure to address some of the key research questions for CO₂ storage projects.

A paper on storage research (from a GNS Science researcher) addressed induced seismic events following injection or extraction. This phenomenon has been widely observed around the world and will require careful study to mitigate risks for large scale CO₂ storage projects. The team studied 65 instances of induced seismic events around the world and estimated the probability of such events, which depend on a wide range of factors, chiefly injection rates and volumes.

CO2CRC capture demonstration projects at Hazelwood power station and Mulgrave in Victoria have been significant research efforts for CO2CRC in the past twelve months and two overview papers were presented at GHGT10. One outlined the operation and research outcomes of the CO2CRC Post-Combustion Capture demonstration project, including the experiences gained from being able to test solvent, membrane and adsorbent technologies under real world conditions. Another described CO2CRC's pre-combustion demonstration project, the first CO₂ capture from a coal gasification trial in Australia, and the preliminary results from testing solvent, membrane and adsorbent technologies.

Several papers at GHGT10 highlighted CO2CRC's CCS economics work. The economics team continues to broaden and expand the range of technologies and case studies to further the methodologies for comparing costs on a consistent basis. For capture economics, recent research has expanded to include capture at iron and steel plants and

A Prosperous New Year to All!



utilising spare grid capacity to flexibly capture CO₂ at a black coal fired power plant in NSW. For storage economics, recent research has focused on the impact of pressure relief for saline aquifers, ranking of saline aquifers for storage and enhanced methane production for coal seam storage. The team has also completed a case study on optimising source-sink matches and pipeline transport networks for SE Queensland.

South Korea aiming for two CCS plants by 2020

South Korea, Asia's fourth biggest emitter, aims to begin commercial operations at two CCS plants by 2020 to help reduce greenhouse gas emissions. The nation will develop two 100MW CCS demonstration projects that will start up in 2014, and commercial operations can be expected by 2020, the Ministry of Knowledge Economy said in November.

South Korea said a year ago that it plans to voluntarily cut emissions by 30% by 2020 under a "business as usual" scenario, corresponding to a 4% reduction from 2005 levels.

Emission cuts hard if CCS not readily available

The executive director of the International Energy Agency Nobuo Tanaka has warned it will be "very difficult" for Australia to meet its 2050 emissions target. He said in Canberra recently the country would face major adjustment costs in achieving greenhouse emissions cuts of 60% by 2050 if it did not have nuclear power for back-up in the event that CCS is not readily available. He also warned that totally renewable energy would be very, very expensive and it is fragile in terms of its productivity.

Mr Tanaka made the remarks after the launch of a government technical paper comparing the costs of electricity generation technology. The document ranked nuclear power as a cheaper zero-emissions technology than solar, but more expensive than fossil fuel power plants with CCS. In launching the report, the Resources and Energy Minister acknowledged it will take another 5 to 10 years before Australia will know whether CCS is viable. Since taking office, Labor has committed \$2 billion to build up to four industrial-scale CCS projects, but has stood by its longstanding ban on nuclear power generation.

A review of international studies, published by Australian researchers in the journal *Energy*, has also backed the option, identifying nuclear as the cheapest technology able to help keep global temperature rises below 2°C.

Study co-author Barry Brook, the director of the University of Adelaide's Environment Institute, said coal and combined gas turbine systems combined with CCS could be effective but it would first require "rapid major advances in technology".

The government has argued that the continued absence of a price on carbon was adding to that problem by delaying investment in low emission power plants. It is bringing together company and industry representatives in Canberra as part of its business roundtable on climate change, which will help it set a price on carbon.

Mr Tanaka said Australia needed a carbon price but could achieve it either explicitly, through a tax or cap-and-trade emissions scheme, or implicitly, through regulation.

Slow progress on clean coal projects

The Australian Coal Association increased spending on CCS projects in 2009-10, but progress has been slower than expected. A\$64M was spent funding CCS projects last financial year, almost double the previous year's \$35M. The fund is the primary source of coal industry investment in CCS. When the Coal21 fund was launched in 2006, it was meant to invest \$1 billion in clean coal technologies over the next 10 years. So far it has spent a total of \$100.4M.

The association's executive director, Ralph Hillman, said take-up of CCS "all depends on a carbon price". Mr Hillman said all low emission energy technologies, including renewables, were developing slower than expected due to policy uncertainty on climate change, both internationally and in Australia. "All this is taking longer than everyone thought," he said. "Climate change policy in other countries has gone right on the back burner. It's not a conducive environment."

The Coal21 accounts show the bulk of total project funding in 2009-10 was spent on pre-feasibility studies for two CCS projects in Queensland - Zerogen (\$39M) and Callide Oxyfuel (\$19M).

Remaining funding was spent on research, including \$5.4M allocated to the Australian National Low Emissions Research and Development Ltd, \$0.25M to the Otway Stage 1 storage project in Victoria, \$0.18M to an assessment of CO₂ storage sites in Queensland, and \$0.16M to the Delta CCS project at Lake Munmorah in the Hunter Valley.

A Prosperous New Year to All!



The Coal21 fund has a statutory obligation to spend \$300M on an IGCC coal fired power station in Queensland. The Coal21 fund has invested in pre-feasibility studies for two IGCC projects: the long-running Zerogen proposal for a 530MW power plant near Gladstone backed by Japan's Mitsubishi Heavy Industries, and the GE- and Xstrata-backed Wandoan Power Consortium, proposing a 334MW plant. Both projects are shortlisted for \$2.4 billion in funding from the federal government's CCS Flagships programme. Final funding announcements are expected early next year.

Shenhua Group prepares pilot CCS facility

A pilot CCS facility built by China's Shenhua Group at its coal-to-liquids (CTL) plant in the Inner Mongolia autonomous region will begin injecting captured CO₂ into underground storage in January, according to a company official. The CTL plant is the first of its kind to go into operation in China and the company plans to produce 3Mt of oil products from coal in 2015, up from 0.5Mt this year. It also aims to produce 11Mt of oil products and 18.3 billion cubic meters of gas from coal by 2020.

China has already built two small pilot CCS plants in Beijing and Shanghai, but officials remain sceptical about the feasibility of the technology, which is expensive to install and will require about 25% more energy to run. Apart from increased fuel and construction costs, experts suggest a plant could also have to pay as much as US\$70/tonne to store the CO₂ safely.

China, the world's largest emitter of CO₂, started pushing for the widespread adoption of coal conversion technologies in 2006 to help cut dependence on expensive foreign oil, but it went cold on coal-to-liquids in 2008, cancelling dozens of projects. The National Development and Reform Commission said the technology was too expensive, used too much water in already arid regions and did nothing to resolve the problem of CO₂.

UK coal firm Powerfuel planning CCS plant calls in administrators

Administrators have been called in to sell the assets of Powerfuel, which owns Hatfield colliery near Doncaster and was planning to build a clean coal demonstration plant in Britain. The firm is owned by a mining entrepreneur and the Russian coal group KRU. Despite being selected by the EU to receive £164M for the project, it is £635M short of the money required to build the plant utilising CCS technology.

The news is another blow to hopes of introducing large scale CCS technology to Britain soon following the decision by the energy group E.ON in October to withdraw its Kingsnorth project from the competition to build a demonstration facility.

Powerfuel also needs another £30M to carry out work on the Hatfield mine, according to KPMG, which was appointed to find buyers for the two Powerfuel businesses. KPMG said neither was in administration and none of the 380 staff at the mine have been made redundant. However, they commented that developing low carbon energy generation requires a large amount of capital up front and the CCS development falls £635M short of the investment needed to progress the project beyond the preliminary stage. "The substantial funding gap has not been addressed in the past 12 months and accordingly the project has stalled. The administration will enable a sales process to find a new owner, who can both take the CCS project forward and buttress the mine, which also requires around £30M of capital expenditure."

Powerfuel is the only company to be awarded a licence to test the CCS technology in Britain. The government in October finally committed £1000M for the UK's first CCS demonstration plant, likely to be developed by ScottishPower. It says it remains committed to putting levies on consumer bills to fund up to three more projects but it is not clear when the funds will be made available. It is likely that Powerfuel would have applied for funding for these later stage demonstration projects.

Shell's Barendrecht CCS project cancelled

Royal Dutch Shell's CCS project in the Netherlands has been cancelled by the government because of lack of support and delays in getting permits. The Minister of Economic Affairs said the project is no longer possible in the short term. Shell and the government wanted two empty natural gas fields about 2km under the town of Barendrecht to serve as the first of a new generation of storage plants.

Residents and town officials opposed the plan, citing safety concerns and the project's experimental nature. The MER commission, an independent panel appointed by the national and provincial governments to assess the project, said in April last year that the plan sufficiently addresses safety concerns.

A Prosperous New Year to All!



The injection of CO₂ could have begun by the beginning of 2013. The plan was to send emissions through a pipeline from a gasification hydrogen plant at Shell's Pernis refinery near Rotterdam, about 20km away.

World Bank invests record sums in coal

Record sums were invested last year in coal power by the World Bank, despite international commitments to slash carbon emissions

The World Bank said that a total of US\$3400M (a quarter of all funding for energy projects) was spent in the year to June 2010 helping to build new coal fired power stations, including the controversial Medupi plant in South Africa. Over the same period the bank also spent \$1000M on looking and drilling for oil and gas.

This did not include a \$1000M project in India which is funding power transmission networks for coal fired power stations rather than the stations themselves.

The World Bank defended its payments saying that the figures for 2010 were distorted by two major coal projects in Botswana and South Africa, while over the five year period from 2005 the bank had spent US\$4500M on coal power, and \$12,500M on renewable energy and energy efficiency.

Coal plants were only subsidised when there were "exceptional circumstances where countries have few or no prospects for other energy sources" according to the World Bank.

CCS technology crucial even as US cuts coal use

Even though the US is starting to move away from coal, it will still need tools such as CCS to meet potential emissions reduction targets, according to the National Energy Technology Laboratory addressing the Washington Coal Club, a non-profit corporation whose members have diverse interests in coal, ranging from its production to utilisation. NETL is part of the US Department of Energy's Office of Fossil Energy's research and development programme for advanced carbon capture technologies for coal-based power plants. Pending rules from the USEPA have the potential to retire smaller units of coal fired generation.

The North American Electric Reliability Corp released an estimate that up to 70GW of electric generation could be required to meet retrofits or be retired as a result of pending EPA regulations. Retired coal generation would likely be replaced with natural gas, according to NETL. Although natural gas produces about half the emissions of coal, over the next 30 years the switch will result in about a 16% reduction in emissions. CCS would be necessary to allow the US to meet CO₂ reductions in the next 10 to 20 years. The challenges with current CCS technology are that it tends to cost more and is done on a smaller scale and the goal of the NETL is to work to reduce those costs and scale up storage.

B&W sparks cleaner coal process

A technology that got a big boost from research in Barberton will be used to reduce emissions from America's first low emissions coal fired power plant. The oxy-coal combustion technology developed by the Babcock & Wilcox Power Generation Group Inc and Air Liquide Process & Construction will be used on the \$1200M FutureGen project near Mattoon, Illinois.

The two companies were included by the US DOE in cooperative agreements with Ameren Energy Resources Co. LLC and the FutureGen Alliance. In September, the project officially got \$1 billion in federal stimulus funds.

FutureGen, designed to produce hydrogen and electricity while capturing and storing CO₂ in underground rock formations, was announced in 2003 by President Bush under a public-private partnership.

The B&W Power Generation Group expects its scope of work to include designing the oxy-coal combustion system, air quality control systems, boiler, steel and other control systems. The project partners expect to spend nine months doing engineering and design work plus an economic analysis. If the project still looks feasible, the partners will embark on environmental studies and seek changes to electric rates. Construction is expected to begin in 2012 and be completed in late 2015.

A Prosperous New Year to All!



Finnish Fortum to scrap CCS project

Finnish energy company Fortum said in October it will discontinue the Finncap CCS project, due to the technological and financial risks. The decision is also based on the company's updated strategy to focus on hydro and nuclear power, as well as combined heat and power production.

Fortum and Finnish electricity generating company TVO collaborated on the Finncap project for several years with the aim to build a large scale demonstration plant for CCS at their jointly owned Meri-Pori power plant. TVO recently withdrew from the project.

As a result of Fortum's move, the project will no longer pursue to be part of the EU's CCS demonstration programme which was supposed to cover part of the estimated investment of 500M euros. Finncap was also eligible for funding from the Finnish government.

Coal - a new solution to fuel problems?

A new solution to power and fuel problems worldwide may be developed by using coal. Professor Diane Hildebrandt is the co-director of the Centre of Materials and Process Synthesis (COMPS) at the University of the Witwatersrand, which developed the new technique, called Any Carbon Source to Liquids (XTL).

"We can take almost any carbon source and turn it into liquid fuel," Hildebrandt said. One of the possibilities is converting solid coal into liquid fuel using the Fischer-Tropsch process, where coal is converted into hydrogen and carbon monoxide before being exposed to a catalyst such as iron or cobalt, then finally condensed into diesel, synthetic lubricants and gasoline.

The downside of this process is the amount of amount of carbon dioxide that is released during the coal's transformation, Hildebrandt said. To solve this problem, Hildebrandt said the refiners can harvest the emissions and use it to grow algae. She said the technique was developed specifically to address Africa's power needs while using the resources available.

Organic materials, from coal to compost, are stores of energy for conversion into liquid fuel. And by harvesting the carbon dioxide and using it to grow algae, jobs can be created and fisheries developed, thus increasing the local food supply.

COMPS hopes to establish a number of small XTL refineries around South Africa, each taking advantage of the local resources, be they coal, biological waste or some other type of matter. The next step is for the technology to receive support from governments in order to build more refineries.

Fast fit weighing system for coal wagons

The fast fit installation of an in-motion rail weighing system from Railweight meant that Ferrybridge power station suffered no delays to its coal deliveries. Requiring no civil work, the company installed the Weighline system during the station's planned three-week closedown period so there was no loss of power generation.

A total of four Weighline systems were installed, which will monitor both inbound coal wagons delivering fuel for the station and empty outbound wagons.

The installation involved removing a section of track before welding in the section of transducer rail. There was no need for special civil foundations, so its installation caused minimal disruption.

Once installed, the system is extremely reliable and durable. It has an IP67 rating so the harsh environment caused by coal dust at Ferrybridge does not affect it. The system also has no moving parts, so it requires little or no maintenance.

Using the trade-approved system, the power station can accurately record and pay for the amount of coal delivered to the site. Three to four freight trains deliver a total of up to 5,000 tonnes of coal every day. Monitoring the amount of fuel delivered is a vital part of the power station's operation, to both control its costs and to monitor its ongoing operational efficiency.

Unlike a static weighbridge system there, is no need to uncouple and weigh each wagon individually, so the Weighline system does not affect the delivery process. It uses wheel-weighing techniques that do not restrict the type or size of cars that can be weighed. It can also detect when a train stops and rolls backwards to avoid multiple weighing.

A Prosperous New Year to All!



The Weighline system is linked to a PLC system at the power system, which sums up the weight of coal delivered by each freight train. This can be interfaced with a PC and other systems at the power station for further reporting – a possibility for the future.

World first to use coal-based jet fuel at airshow

SASOL has scored a world first, officially launching its 100% synthetic coal-to-liquid (CTL) jet fuel on the market at the Africa Aerospace and Defence Show at Ysterplaat Air Force Base, near Cape Town.

Various airlines and oil firms have developed and tested synthetic fuels or biofuels in the past few years, but these fuels have been blended with conventional crude fuel or used only in one engine. Sasol's fuel marks the first time that a fully synthetic fuel was used on a commercial flight.

With the airline industry pledging to achieve carbon neutral growth from 2020 and reduce emissions 50% by 2050, these developments are being keenly watched. In 2008, Virgin Atlantic became the first airline in the world to operate a commercial aircraft on a biofuel blend. The Boeing 747 flew a short flight from London to Amsterdam, using a 20% biofuel, 80% kerosene blend in one of its four engines.

While the achievement of 100% synthetic jet fuel is a milestone, Sasol and other oil firms still have a long way to go before a commercially viable biofuel or eco-friendly fuel becomes available.

Successful recovery of coal from sludge

A new technology for removing water from ultrafine coal slurry has been successfully tested at the commercial scale at an operating coal cleaning plant. The technology offers the possibility of reducing the coal slurry impoundment problem from the source.

Cleaning coal after it has been mined is done with water. The bulk of the coal mined is relatively coarse in size and, therefore, can be readily washed of impurities and subsequently dewatered. However, a portion of mined coal is smaller than approximately 30-40 microns – something like the size of talcum powder – and is difficult to dewater after cleaning. As a result, finer coal is often discarded to slurry impoundments. There are hundreds of sludge impoundments in the US, mostly in Appalachia, creating environmental and safety concerns.

The Center for Advanced Separation Technologies (CAST) at Virginia Tech have developed a hyperbaric centrifuge that was sublicensed to Decanter Machine.

In the pilot-scale test, coal slurries consisting of ultrafine coal were dewatered to less than 20% moisture. "The product coal feels like dry powder when you touch it because the water left with the coal is spread so thinly across its large surface area."

According to a National Research Council report, the U.S. coal industry discards annually 70 to 90Mt of fine refuse to slurry impoundments. "The dewatering technologies developed by CAST will help coal companies recover all of the mined coal. The technology can also be used to recover the coal in existing impoundments, which can help clean-up the environment and create jobs in the coal producing regions like Southwest Virginia.

The centrifuge technology is the most recent of the advanced technologies developed by CAST. Microcel™ flotation column was the first major separation technology developed. It uses microbubbles to separate fine coal from mineral matter that becomes ash when burned at power plants and from other impurities, and is used widely in Australia.

As part of a project funded by National Energy Technology Laboratory, CAST has developed two other advanced dewatering processes. One is the novel dewatering aids that are currently marketed by Nalco Company. The other is a technology that may be more useful for recovering and dewatering the ultrafine coal from existing impoundments. Virginia Tech has applied for a patent for this new technology.

Simulator facilitates clean-coal plant training

Invensys is supplying simulator solutions to the National Energy Technology Laboratory and the US DOE to facilitate development and training for clean coal plant operations.

A Prosperous New Year to All!



The company's Eyesim and Dynsim solutions will assist in the development of new-generation zero-emission integrated gasification combined cycle power plants with carbon capture.

The Advanced Virtual Energy Simulation Training and Research Center, or Avestar, in Morgantown is part of the Department of Energy's initiative to develop new clean-coal power plants that burn fuel more efficiently to produce environmentally friendly electric power.

Eyesim and Dynsim provide a high-fidelity and virtual-reality simulated environment in which prospective plant personnel learn to operate and interact with a clean-coal facility, much like an aircraft pilot trains on a flight simulator.

Biogenetic methane enhancement from coal

Regal Resources has entered into an agreement to acquire Enhanced Biogenic Methane. EBM has secured an exclusive Australian and Northern Ireland licence to biogenic methane enhancement (BME) technology, which has been granted from the Western Research Institute of Wyoming, who are at the forefront of this technology globally. This transaction enables Regal to focus on applying the EBM technology at its Oak Park Pilot Site, located west of Melbourne where there is evidence of substantial quantities of brown coal to which the EBM technology may have a commercial application.

Regal holds 1407 km² of tenements in Victoria containing approximately 10,000Mt of non-JORC brown coal. It is proposed that a trial of the EBM technology will commence in the near term upon regulatory approvals being granted. Over the last six months substantial work has been undertaken on the approval process, and it is anticipated the trial will commence during October 2010. The trial, initially focused on an existing well at Oak Park, will involve the stimulation of microbes within the 20m thick coal seam to produce methane gas. The trial will cover three phases to examine specific aspects of the technology, with each phase planned to run for a minimum of 45 days.

The BME technology involves speeding up the natural biogenic process that produces methane known as coal seam gas. Biogenic methane accounts for 20% to 40% of the total methane reserves on earth. Major sources include coal seam gas in the Surat Basin in Queensland, Australia and Powder River Basin in Wyoming, USA. BME works by artificially stimulating the naturally occurring micro-organisms called methanogens that break down the hydrogen and carbon from the coal and emit methane. BME technology works best on lignite (brown coal), low rank black coals and oil shale. This is because of their high volatiles and hydrogen content, which if all converted to CH₄ would yield gas quantities several times that of traditional coal seam gas.

Application of BME is expected to be via the same drilling techniques used in the CSG industry. One of the advantages of BME over coal seam gas is that the groundwater is an aid to the process and is required to maintain anaerobic (oxygen free) conditions. Also, as only a small amount of the coal is converted to CH₄, there is no surface subsidence as can happen with underground mining or underground coal gasification.

BME has been demonstrated to produce methane real time in both bench scale trials (lignite and black coal) and field tests (black coal). Although at the early stages, the technology development is starting to attract significant attention. One of the other proponents of BME, Luca Technologies of Colorado, raised \$75 M in late 2008 and has acquired more than 1,000 depleted CSG wells in the USA. It believes BME technology can bring these wells back on production.

Quick fix for coal mine methane emissions

A new methane burner, developed at the University of Sydney and under consideration by mining companies, has potential to reduce greenhouse gas emissions from underground coal mines by almost 90%. The burner uses porous combustion media allowing for ultra lean combustion that transforms methane into CO₂ and water at concentrations much lower than a traditional burner.

A full scale version of the burner (3m high and weighing about a tonne) has been built on site at the University and successfully trialled.

The process of mining coal accounts for about 6% of methane emissions caused by human activity, according to the School of Chemical and Biomolecular Engineering in the University's Faculty of Engineering and Information Technologies. If adopted by industry, the burner would substantially reduce the coal mining industry's greenhouse gas liability.

A Prosperous New Year to All!



Converting carbon residue from coal to oil

Bixby Energy Systems Inc has added carbon liquefaction technology to its energy portfolio, which when commercialised, will allow the company to produce both synthetic gas and light sweet crude oil from coal without the need to burn the coal and significantly reducing greenhouse gases. The company expects to complete construction of a liquefaction beta unit in mid-2011 and plans to move into commercial production at that time.

The Bixby Process consists of two phases: devolatilisation and liquefaction. The devolatilisation process does not burn coal, but rather superheats it in a closed loop environment. This produces a high quality synthetic gas that is not achieved in other gas conversion processes. The remaining by-product of the coal is solid, semi-activated carbon material, which is used in Bixby's liquefaction process. The carbon solids are processed in a Bixby liquefaction reactor where they are combined with hydrogen, super-heated and continuously pressurized to produce a semi-refined light sweet crude oil, which can be further processed into diesel fuel, jet fuel, gasoline, or other fuel products. Any remaining non-usable material is vitrified and made into inert ingots for safe disposal.

EVENTS

21/03/2011 - 24/03/2011, 25th international coal supply contracts and transport logistics, Jakarta, Indonesia, Coaltrans Conferences Ltd., Nestor House Playhouse Yard, London EC4V 5EX, UK, Fax: +44 20 7779 8946, Internet: www.coaltrans.com/Calendar.aspx

10/04/2011 - 13/04/2011, APPEA 2011 conference & exhibition, Perth, WA, Australia, Moira Lawler, APPEA, Level 10, 60 Marcus Clarke Street, Canberra ACT 2600, Australia, Tel: +61 2 6267 0906, Internet: www.appeaconference.com.au

11/04/2011 - 13/04/2011, 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

14/04/2011 - 15/04/2011, 9th annual Coaltrans Chin, Beijing, China, Coaltrans Conferences Ltd., Nestor House Playhouse Yard, London EC4V 5EX, UK, Fax: +44 20 7779 8946, Internet: www.coaltrans.com/EventDetails/0/3635/9th-Annual-Coaltrans-China.html

08/05/2011 - 12/05/2011, CCT2011: 5th international conference on clean coal technologies, Zaragoza, Spain, Robert Davidson, IEA Clean Coal Centre, Gemini House, 10-18 Putney Hill, London SW15 6AA, UK, Tel: +44 20 8780 2111, Fax: +44 20 8780 1746, Email: service@iea-coal.org.uk, Internet: www.cct2011.org/ibis/cct2011/cct2011-conference

30/05/2011 - 02/06/2011, 17th annual Coaltrans Asia, Bali, Indonesia, Coaltrans Conferences Ltd., Nestor House Playhouse Yard, London EC4V 5EX, UK, Fax: +44 20 7779 8946, Internet: www.coaltrans.com/EventDetails/0/3636/17th-Annual-Coaltrans-Asia.html

17/07/2011 - 20/07/2011, 7th international symposium on coal combustion, Harbin, China, Shaozeng Sun, Harbin Institute of Technology, 92 West Dazhi Street, Nan Gang District, Harbin 150001, China, Tel: +86 451 86412238, Fax: +86 451 86412528, Email: sunsz@hit.edu.cn, Internet: www.7thiscc.net

FEEDBACK

*This e-Newsletter is published for the Coal Association of New Zealand Inc. by CRL Energy Ltd.
We value your feedback on issues discussed in this e-Newsletter.
For comments or enquiries about specific articles, please contact:*

*The Editor
CRL Energy Ltd
PO Box 31-244 Lower Hutt
Phone: 04 570 3715 Fax: 04 570 3701*

DISCLAIMER

The views contained here may not represent the views of Coal Association of New Zealand (CANZ) Inc., its members and affiliates. CANZ makes no representation, warranty or guarantee as to the accuracy or completeness of the information (including news, editorials, prices, statistics, analyses and the like) provided through this publication. In no event shall CANZ or its members and affiliates be liable to any person for any decision made or action taken in reliance upon the information provided herein.

A Prosperous New Year to All!