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COAL NEWS

New Zealand

PM wants economic benefits for New Zealanders from unlocking natural resources

In his February statement to Parliament, Prime Minister John Key talked of six main policy drivers at the heart of the government's economic plan, including better regulations around natural resources. In general, the government is in favour of unlocking resources for economic benefit and to create better paid jobs for New Zealanders, where this is also consistent with environmental, conservation and other objectives.



He said New Zealand's natural resources have the potential to significantly raise the country's economic performance. He referred to the "extraordinary economic potential" in the mineral estate residing in Crown-owned land. Mining in New Zealand uses just 40 square kilometres of land, less than 0.015% of our total land area. The export value of that land however is \$175,000/hectare, which makes mining an extremely valuable use of land.

Submissions open for review of Schedule 4 of the Crown Minerals Act

In March, the government released a discussion document to seek public feedback on minerals exploration in specified public conservation areas and a number of related policy initiatives. A recent minerals stock-take has identified areas covering 7,058 hectares for potential removal from Schedule 4 of the Crown Minerals Act 1991 and areas covering 12,400 hectares for addition to Schedule 4. The government said it has a role to improve our currently limited knowledge of the mineral estate and stressed that no decisions would be made until submissions have been considered (26 May deadline).

Schedule 4 restricts mineral related activity in specified public conservation areas. Over the last six months, the Ministry of Economic Development and the Department of Conservation have conducted this stock-take, involving a desk-top mapping exercise to evaluate existing information on the mineral potential and conservation (including tourism, recreation and cultural) values of these areas.

The key conclusions from the stock-take were that New Zealand is mineral rich and the environmentally responsible development of this potential is a very real possibility. Much of the country's mineral potential is concentrated, often in public conservation areas with high conservation and cultural values. The mineral potential of Schedule 4 lands could be developed with only a very small proportion of the land being directly impacted.

Bathurst to buy L&M coal assets

Listed Australian company Bathurst Resources Ltd has entered into a joint venture agreement to buy L&M Coal Holdings' coking coal exploration assets in Buller. Exploration by L&M Coal, estimated two permitted areas covering more than 10,000ha in Buller contain 50M tonnes of premium coking coal and 90M tonnes of thermal coal. Studies show it should be developed as an opencast operation that could be in production within 18 to 24 months, according to Bathurst.

In an announcement to the Australian Stock Exchange, the company said due diligence of the Buller coalfield was still under way. No details were given on the purchase price of L&M Coal or possible equity raising, but Bathurst would stop expenditure on its mining assets in Kentucky and negotiate to return them to the previous owner.

Privately owned L&M Coal is a subsidiary of the wider L&M Energy which is focusing on coal seam methane gas and petroleum exploration, largely in the lower South Island. Sharemarket listed L&M Energy (formerly known as L&M Petroleum) recently received shareholder approval to complete its acquisition of L&M Coal Seam Gas Ltd.

Solid Energy proceeding with CSG drilling in a number of regions

Solid Energy continues to work through its next move in its CSG programme in its Huntly licence area. Extensive work has been undertaken to prove up the resource and formulate a field development strategy, as the company approaches a large scale commercialisation decision this year.

The company has said that if it decides to go ahead with commercialisation at Huntly, stage one of the programme - including drilling and completion of wells - is likely to take place later in 2010. In the event stage one is a success, stage two commercialisation could take place in early 2012.

Solid Energy also has a new Taranaki CSG drilling programme to focus on the northern part of the Stratford District. Two exploration holes have been drilled, with a third in progress in the Tahora – Tangarakau area. A single drill rig, similar to those used for water well drilling carried out work with the permission of individual landowners and consents from the Stratford District Council. The drilling will further define Solid Energy's coal resources and the potential for coal seam gas. Four similar

exploration holes were previously drilled by Solid Energy in the Taranaki near Mt Damper and Waitaanga last winter.

Solid Energy has also recently sought to increase its CSG presence into Southland, with an application to Crown Minerals for a new exploration permit. The permit takes in 1,393 km² of onshore and offshore acreage at the bottom of the South Island, and if granted the licence would enable the company to explore for CSG, oil, condensate, LPG, petroleum, and gas.

Solid Energy has been investigating coal seam gas as a source of energy since 2005. It has successfully generated electricity from August 2008 using a 1MW gas generator from a six 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.

Pilot CSG drilling approaches for Comet Ridge

Australian coal seam gas explorer Comet Ridge is preparing to drill two pilot wells in its West Coast mining licence, having completed a core well in the permit towards the end of last year. PMP 50100 takes in just over 170 km² near Greymouth. Comet Ridge operates the permit and holds a 20% stake, with MacDonald Investments Ltd (MIL) holding the remainder. However, under the terms of the farm-in agreement between the pair Comet Ridge's stake lifts to 50% upon completion of the pilot wells.

Comet Ridge said the Macdonald-5C core well intersected permeable coals in the Brunner coal measures, though 'technical issues' prevented drilling and testing the deeper Papanoa measures. Technical results from the well are being used in the planning for the upcoming completion of pilot wells in the licence. The company is aiming to begin pilot production by June.

Aeromagnetic data was acquired over exploration permits in North Waikato and another West Coast permit, both 100% held and operated by Comet Ridge. Data was also gathered over PMP 50100. Interpretation and integration of the surveys is underway, and the company is assessing tenders for a round of Airborne Gravity Gradiometry surveying.

In Australia, an ongoing drilling campaign began in the ASX-listed company's 100% held Galilee Basin permits in Queensland, while evaluation of data over Bowen Basin (Queensland) and Gunnedah Basin (New South Wales) licences continued.

L&M looks at placement to fund packed CSG programme

L&M Group is advancing talks for a A\$30M float on its coal seam gas licences, as operator L&M Coal Seam Gas (L&MCSG) continues to advance a packed exploration and pilot production programme. The placement is intended to fund a CSG work programme through to 2011, which will include drilling of up to 50 holes.

In the North Island, L&MCSG's interests are South Waikato licence petroleum exploration permit 50348 and the adjacent southern acreage PEP 51244 (Ohura River).

A two-hole drilling programme in the South Waikato permit has recently been completed, and L&MCSG is currently awaiting the results of tests before taking further steps. The first well encountered a 10 m thick coal seam at around 500 m in depth, and the second intersected an 11 m seam at around 650 m. Coal samples from both wells have been sent for laboratory analysis.

A pilot production project in the south east of the Kaitangata permit is under way and further exploration to the north of the current focus area is also in the pipeline.

A production well has been drilled at Ohai, as part of the pilot production project recently initiated in the permit. L&MCSG has also kicked off its first gas reserves certification process.



Taranaki firms form first CSG joint venture

Fitzroy Engineering Group and ITL have teamed up to form New Zealand's first engineering consultancy joint venture specialising in the coal seam gas sector here and across the Tasman. The joint venture operates under the "FIT CSG" brand and logo. Both New Plymouth-based companies have worked independently in Australia before and sometimes together, though not in a formal joint venture.

The companies decided to effectively merge their specialist skills in design, fabrication and marketing - primarily to exploit the massive Aussie CSG industry where billions of dollars are scheduled to be spent over the next few years in both domestic and export oriented projects.

INTERNATIONAL NEWS

Australia

Peabody approves expansion of Metropolitan Metallurgical Coal Mine

The Board of Directors of Peabody Energy approved the upgrade and expansion of the Metropolitan Mine in New South Wales. The expansion is expected to increase annual capacity by 1M tonnes within several years. Capital investments for the expansion are expected to total A\$70M, of which approximately A\$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 1.5M tonnes of mostly coking coal for export to Asian steel producers. Metropolitan Mine is an underground mine using the longwall method. Its coal ships through Port Kembla south of Sydney.

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


A\$60 billion coal deal with China

Australian company Resourcehouse said in February it had struck a A\$60 billion, 20-year agreement to supply coal to China Power International Development, calling it Australia's biggest export contract. The deal is the latest in a string of major contracts between Chinese firms and Australian resource companies as the China tries to secure the energy, steel and other materials it needs for its surging economy.

Resourcehouse said it would supply 30M tonnes of coal a year to the Chinese company, at a price of about A\$3 billion a year, for 20 years starting from about 2014. The deal would help bring about the planned development of a series of mines and other infrastructure, including a 500km rail line and port facilities in the Galilee Basin in northeastern Queensland.

Privately owned Resourcehouse is controlled by Clive Palmer, a renowned deal-doer who enjoys support for the project at the top of the Australian and Chinese Governments, but some industry observers doubt that the massive project will proceed. A week after the deal was announced, the alleged buyer, China Power International (CPI) Development, denied all knowledge. The correct buyer, state owned CPI Holdings, eventually clarified that it had a "framework agreement" with Resourcehouse, but it has not confirmed the A\$60 billion figure.

The mine at the centre of the deal has an estimated resource of 7000M tonnes of coal and was acquired in a A\$140M takeover of Waratah Coal last year. Mr Palmer plans to spend a further A\$7.5 billion building the mine and infrastructure, which would be capable of exporting 40M tonnes of coal a year. Industry experts consider that if the Chinese are prepared to fund the project, the railway and port developments are unlikely to be completed by 2014.



The nearby Surat Basin rail link to Gladstone is seen as much more advanced, though it will not be ready until 2012. At 210km, it would be less than half of the length of Mr Palmer's, and the companies building it have been working on planning and approvals since 2007. Some experts can not see the commercial rationale for choosing the Galilee Basin, which is west of the established coal basins, the Surat and the Bowen. The Waratah resource is also thermal coal, a less valuable commodity than coking coal.

New Hope joins the bidding war for Macarthur Coal

Australian coal producer New Hope has bid A\$3.7 billion in shares to buy Macarthur Coal, battling rival proposals from Peabody Energy and Noble Group. The contest for Macarthur came after shipments of coal to China last year tripled and prices doubled. Xstrata, the world's biggest exporter of thermal coal, may also be preparing an alternative proposal, approaching ArcelorMittal and South Korea's Posco, two of Macarthur's biggest shareholders, according to the Australian Financial Review.

One analyst considered the bidding war shows the interest the world has in Australia's key energy resources. The primary driver of this is the steel industry is recovering globally, reaching the stable levels seen in terms of production rates 12 to 18 months ago. Prices for coking coal are rising on demand from China and as heavy rain and flooding in Queensland constrain exports. Posco recently agreed to pay US\$167/tonne for semi-soft coal, compared with US\$80/tonne for the year ended March 31, and an industry forecast of US\$125/tonne.

BHP Billiton's Hay Point closure lifts coal price

The closure of BHP Billiton's Hay Point coal terminal in Queensland is forcing up the spot price. A cargo of premium quality Australian coal has been sold at US\$240/tonne while offer prices for the steel feed are about US\$240-250/tonne, up from US\$220-225/tonne. BHP announced recently that the terminal suffered damage from cyclone Ului and the port remained closed, forcing BHP to declare force majeure on shipments from the port.

BHP Mitsubishi Alliance is the world's biggest producer of coking coal for the seaborne market, having a total mine capacity of about 58M tonnes a year. The bulk of that material is exported through Hay Point, which has capacity of up to 45M tonnes a year.

Arrow CSG assets acquired by Shell and PetroChina

Shell announced a joint A\$3.5 billion deal with PetroChina that will give Shell access to Arrow Energy's holdings of coal seam gas reserves, while conventional supplies are either declining or off-limits in other parts of the world. Shell and PetroChina will gain control of Australia's largest holder of permits to extract gas from coal seams for processing into liquid form for export.

It is the biggest Australian coal seam gas transaction since ConocoPhillips paid US\$5 billion for a stake in Origin Energy's gas assets in 2008. ConocoPhillips and Malaysia's Petroliaam Nasional Berhad have also acquired coal seam gas assets in Queensland to feed planned LNG projects.

Coal bed methane, gas in shale and tight gas held between rocks are together known as unconventional gas resources. These deposits can break even with oil prices between US\$30-50/barrel, making them more profitable than alternatives such as deepwater oil and gas or Canadian tar sands, according to industry experts.

Canada

Coal in Canada

Canadian coal reserves amount to about 10,000M tonnes. These known deposits are enough to support the current 70M tonnes per year production rate for almost another 150 years. About 40% of this production is exported, mainly to Asia for steelmaking.

A very large part of Canadian coal resources are to be found in two Western provinces, British Columbia and Alberta. Three-quarters of the electricity produced in Alberta comes from coal fired thermal power

stations. On the East Coast, the province of Nova Scotia also uses its local coal resources to produce most of its electricity.

In recent years, the Canadian coal industry and the Canadian public sector have invested major resources in order to improve the environmental balance sheet of this energy system. Efforts have been focussed especially on reducing emissions of sulphur dioxide and nitrogen oxides during the coal combustion process. Several new technologies have already brought near-zero polluting emission levels within reach for new coal fired thermal power stations.

Reduction of CO₂ emissions represents another major challenge. Ongoing improvements in the efficiency of power stations have reduced these emissions for every kilowatt-hour produced. More generally, CO₂ capture and sequestration technology constitutes a new tool that has the potential to significantly reduce greenhouse gas emissions associated with fossil fuel combustion.

Alberta to invest in Swan Hills coal gasification, power and CCS project

The government of Alberta recently signed a letter of intent with Swan Hills Synfuels (Calgary, Alberta) to develop a C\$1 billion coal gasification and carbon capture and storage (CCS) project in the north-central region of the province.

The government is expected to invest about C\$271M in the project from a C\$1.33 billion CCS fund. The coal gasification project will process deep-seated coal near Swan Hills and produce synthetic gas or syngas. Combustion of syngas, which has a low CO₂ and high hydrogen content, is 50% cleaner than that of conventional natural gas. The syngas will be utilized to generate cleaner electricity

The CCS facility will capture 1.3M tonnes/year of CO₂, which will be used to revive oil wells through the enhanced oil recovery (EOR) process. Construction is expected to begin by 2011, with the first EOR scheduled for 2015.

Alstom and TransAlta launch CCS demonstration project

Alstom and Canadian power company TransAlta are to construct a large scale CCS demonstration facility at one of TransAlta's coal fired generating stations in Canada.

Project Pioneer will be located at the new 450MW supercritical coal fired Keephills 3 power plant in Alberta and will use Alstom's proprietary Chilled Ammonia Process.

The demonstration project will be able to capture approximately 1M tonnes of CO₂/year. It will be the first project in the world that will have its own integrated underground storage system. The project is one of the last major steps required by Alstom prior to the planned commercial availability of this technology from 2015 onwards.

Alstom Power said "The significant size of this project demonstrates that we are no longer in the testing phase, but are ready for commercialisation. The lessons learned from Project Pioneer, as well as other carbon capture and storage projects worldwide will allow Alstom to answer to its engagement to commercialise its carbon capture technology."

China

China sets up national energy commission

China has set up a national commission to coordinate energy policy, as the country's soaring power needs are increasingly forcing it to look abroad for supplies. The National Energy Commission, headed by Premier Wen Jiabao, will formulate a "national energy development strategy," review energy security and development issues and coordinate international cooperation. The 23-member commission will include several of the country's ministers, including those with the finance, foreign affairs, commerce and environmental protection portfolios.

China has embarked in recent years on an aggressive campaign to secure overseas energy supplies to satisfy sky-rocketing demand fuelled by its fast expanding economy. Analysts said that while the

body's exact powers so far remain unclear, its establishment appeared aimed in part at putting Chinese government muscle behind overseas deals typically done by individual state-owned energy firms. Such deals, conducted by a single company, have often met with various difficulties, according to one expert.

Another said the move was also a bid to centralise decision making currently spread across a range of government agencies, adding there have been growing calls by industry groups for a firmer hand at the top as overseas resource deals have increased, and amid recent natural gas and coal shortages.

Carbon capture unit a small step for clean coal

The Chinese government is keen to build CCS expertise and manufacturing capacity at an early stage so that Chinese manufacturers will be in the front ranks of those supplying the emerging CCS equipment market.

Coal producer Shenhua Group is building a pilot CCS plant at its direct coal liquefaction plant in Inner Mongolia Autonomous Region at a cost of US\$1.5 billion. It is due to come on line within two years.

China is also building IGCC plants, which can produce about 20% less CO₂ than conventional pulverised coal power plants. China has eight IGCC pilot projects in preparation or construction, some with foreign partners. Building work on its first commercial scale plant started in June.

The Xi'an Thermal Power Research Institute Co, a Huaneng unit, agreed earlier this year to supply US company Future Fuels LLC with gasifiers and other equipment for an IGCC power plant in Pennsylvania.

Energy efficient flow control systems for ultra-supercritical coal power plants

NF Energy Saving Corporation of China announced it has completed the first batch of energy efficient flow control systems for a large power plant in Guangdong province. Four butterfly valves are to be delivered by the end of 2009 and another batch of four butterfly valves is to be delivered in 2010. This 2000MW power plant is China's new ultra-supercritical coal power plant being built to replace small, inefficient plants. It will greatly improve the electricity supply in the Pearl River Delta Area.

The company has also won the bidding on Phase III of a large ultra-supercritical coal power plant in Zhejiang province. NF Energy will supply 6 sets of its fluid control butterfly valves to the project. This 2000MW plant will be online in the third quarter of 2011. The total installed capacity of this power plant will be 5000MW, equivalent to one-third of Three Gorges Hydropower Station, becoming one of the largest energy bases in China.

Coal mine accidents, fatalities drop in 2009

China's State Administration of Coal Mine Safety (SACMS) reported to a national meeting on workplace safety that there were 1616 coal mine accidents in 2009, down by 338 compared to the year before. Accidents caused 2631 deaths, down by 584 year-on-year.

SACMS warned the country's small coal mines, which produce 35% of the country's coal, were responsible for 70% of the fatalities. The agency has pledged to reduce the number of small coal mines to below 10,000 by the end of the year. A total of 1088 small coal mines were closed last year.

India

JSW to acquire overseas coal mines

The JSW group plans to acquire coal mines in Australia, Indonesia and South Africa in the next 12 months and is likely to spend around US\$500M to secure supply to its growing steel and power businesses.

Sources said talks were on with potential miners and a deal could be clinched within the next 6-12 months. The firm is exploring the options of acquisition, joint venture or a long term contract.



The group will import about 6.5M tonnes of coal in the first fiscal year and about 10M tonnes in the next to partially meet the requirement of its steel and power plants. The company plans to increase its power generation capacity to 11,500MW in the next six years.

Regulatory body for coal sector coming

Coal India Ltd (CIL) is planning to form an independent regulatory body which would look into allocation of coal blocks, approval of mines and competitive price regulation. Emphasis was being given to the deregulation and opening up of the coal sector to private players with the help of state owned organisations.

CIL also announced that a fixed minimum wage would be introduced to all contractual employees of the coal sector. The wage would be determined by the Chief Labour Commissioner. Granting of Maharatna status to a Public Sector Enterprise is a move by the government to grant greater operational and financial autonomy to high performing companies.

Sasol-Tata joint venture wants to build coal to liquids plant

Tata Group (India) and Sasol (South Africa) have approached the Orissa government to set up their coal-to-liquid fuel facility in the state with an investment of US\$10 billion. The companies formed a joint venture two years ago with a view to building India's first CTL plant but the project has yet to find a suitable location.

The key consideration when selecting the location for this venture is access to coal. The proposed plant is seen as helping India meet its growing fuel requirements. The joint venture company urged the state government to provide adequate facilities for early commissioning of the project.

The project, which is targeting commission in 2018, would produce 80,000 barrel of liquid fuel per day. The project would generate employment, both direct and indirect, for 35,000 people. The project would need 1,300 hectares of land for the proposed plant and 110M litres of water per day. Additional land would also be required for setting up the coal mine, beneficiation plant, coal handling plant, water reservoir, power plant and township.

The coal-to-liquid fuel project, which would require about 28 to 31M tonnes of coal/annum, would source this from Arakhpal and Srirampur mines of the Talcher coal belt. Besides generating 1,600MW of power, the plant will produce diesel, naphtha and liquid petroleum gas. The by-products will be tar, phenol, sulphur, ammonia, fertiliser and mining explosives.

India to start renewable energy fund by taxing coal use

India, the world's fourth largest greenhouse gas emitter, plans to levy a tax on coal and use the money to start a national fund to back renewable energy projects. The plan was announced by the Finance Minister in his annual budget speech to parliament in February.

A clean energy tax of 50 rupees (US\$1) a tonne will be imposed on domestic and imported coal raising up to 25 billion rupees but the target for the fund was not specified. The Minister also proposed tax incentives to help boost investment in solar, wind and geothermal power generation.

India and China have rejected binding targets on emissions, saying this would hamper growth. Ahead of the Copenhagen meeting in December, India set a voluntary target to cut its carbon intensity (emissions per unit of GDP) by as much as 25% by 2020 from 2005 levels.

Indonesia

Subhash Projects begins mining at coal block

Subhash Projects and Marketing (SPML) of India has begun mining at its coal block in Indonesia and will soon begin dispatching coal.

SPML had acquired the PT Bisma mine along with power equipment maker Emco last year for about US\$40M. SPML holds 55% in the mine and Emco the rest. The mine has reserves of over 100M tonnes.



The Indonesian government has proposed a plan to cap the export of coal at 150M tonnes a year to meet the demand of local companies. The plan could come into force next year.

BHP to sell stake in Maruwai coal

Mining group BHP Billiton wants to sell a 20 to 25% stake in its Maruwai coal project in Indonesia's Kalimantan on Borneo island.

The decision to keep a majority stake, after BHP last year signalled it would not develop the project, may show bids for the whole project were too low or that BHP sees better coal fundamentals.

Sources said Indonesian coal miners PT Bumi Resources, PT Adaro Energy, and PT Indika Energy were among the bidders for the Maruwai coal project. One said the world's largest miner had received bids both for 100% of the project - valued at roughly US\$500M - and also for 25% stakes.

The Maruwai coal project is expected to start commercial production in 2014 and output is then seen reaching 6M tonnes of both thermal and coking coal within five years. The project will need between US\$500M and US\$1 billion to produce 6M tonnes. BHP plans to build a railway connecting the mine to the nearest barge loading ports to help expand production.

NTPC to buy 2 coal mines

NTPC of India plans to acquire two coal mines in Indonesia, as it tries to secure fuel supplies for its plants. NTPC has already announced plans to acquire coal mines in Mozambique and South Africa. It had earlier sought to buy a stake in Australian mines.

The generator is facing an acute coal shortage at its projects across the country. It has a total requirement of 125M tonnes/annum and planned to meet demand by importing over 12M tonnes in the current fiscal year.

Mozambique

Coal fired power station approved

Australian company Riversdale Mining has announced that the Mozambican Environment Ministry has approved the environmental impact study for the construction of a coal fired power station at Benga, in the western province of Tete.

Once the requisite fees are paid, Riversdale will have its environmental licence, and can push ahead with building the power station. This follows the green light given earlier in the month for the Riversdale coal mining project at Benga, when the Ministry approved the environmental impact study for the open cast mine.

Riversdale plans to start mining and processing coal in 2011. During the initial phase, due to run until 2014, the Benga mine should produce 5.3M tonnes of raw coal a year, to be processed into about 1.7M tonnes of top quality hard coking coal, plus 0.3M tonnes of thermal coal per year for export.

Later phases should raise the production capacity to 10 and eventually 20M tonnes of coal a year.

Netherlands

RWE may build Dutch CCS plant amid German opposition

RWE AG, Germany's second largest utility, said public opposition to storing CO₂ in the country may push it to build a coal fired power plant with facilities to capture emissions in the Netherlands. RWE shelved plans to build a power plant near Cologne that would trap CO₂ emissions from local lignite after the government delayed a law to promote the technology.

The company met opposition on potential storage in the state of Schleswig-Holstein, where locals and lawmakers called on a ban on concern the technology may be dangerous or lower real estate prices.

While legislation supporting CCS is scheduled to be unveiled this year, the utility said it needs public backing to make investments.

RWE said in January that it would develop CCS technology with Essent NV after buying the Dutch utility. The Dutch port of Eemshaven is a possible site for a test power plant.

The Netherlands will support small scale CCS projects and is considering how to encourage the start of several larger demonstration projects in 2015, according to the Environment Ministry. A carbon storage project by Royal Dutch Shell Plc in Barendrecht was allowed to proceed in phases after that project met local opposition amid safety concerns.

South Africa

Long term coal supply contracts to be signed by next year

South Africa expects to sign long term supply contracts for its coal fired power stations, including two new 4,800MW plants, by the end of next year.

State power utility Eskom has commissioned the new Medupi and Kusile power stations as part of a US\$50 billion expansion programme, to help meet rising demand in Africa's largest economy battling with power shortages.

It is expected that the long term contracts for the current fleet of coal fired power stations, including Kusile and Medupi, will be finalised by the end of 2010.

Eskom to review Exxaro coal contract

Eskom plans to review its coal supply agreement with miner Exxaro Coal as part of its efforts to lower input costs. This will be the second major contract Eskom has reviewed this year. The first led to the cancellation of the Rio Tinto Alcan smelter electricity supply deal in Coega in October.

Eskom is also reviewing longstanding contracts with BHP Billiton and recently put on ice contracts for Kusile, one of two new coal fired plants. The plan to review the Exxaro contract, signed last year, has prompted the miner, the main coal supplier to Eskom, to suspend its funding programme for a project associated with the Medupi power plant, Eskom's other new coal fired plant.

Eskom to drive Anglo's coal strategy

Anglo American's South African coal unit expects domestic demand to drive future expansion, especially in the underexploited Waterberg area.

The company said its goal to raise its South African coal output from 60 to 90M tonnes would be largely driven by demand from top customer Eskom, which currently relies on coal for 95% of its energy supply, and independent power producers due to join the energy sector.

The Waterberg area has been touted to become the country's next coal hub, but the lack of adequate infrastructure and water has been identified as a major challenge to the industry. Anglo is expected to start mining for coal in the Waterberg, where the company has in excess of 4 billion tonnes of coal, within the next 10 years. The unit, which delivers more than 60% of its output to Eskom, has two new projects on the cards, meant to feed the utility's power plants.

Anglo exports around 27-28% of its coal output. Most other South African coal producers have been focusing on exports to feed rising demand from Asia, especially India.

South Africa to get World Bank loan for coal plant

World Bank has approved a US\$3.75 billion loan to help South Africa build a coal fired power plant despite opposition from the US and environmental groups. The US abstained from the executive board's discussion, expressing concerns about the climate impact of the power plant project.



The bank said the loan is aimed at helping South Africa achieve a reliable power supply while also financing some of its solar and wind power plants. It said the coal powered power plant would use for the first time on the African continent the "supercritical technology" that major industrialised nations employ in similar plants.

United Kingdom

Drax suspends plan to replace coal with biomass

Britain's biggest power station has suspended its plan to replace coal with biomass, leaving the government little chance of meeting its target for renewable energy. Drax in North Yorkshire is withdrawing a pledge to cut CO₂ emissions by 3.5M tonnes a year (or 17.5%).

The power station, which is the country's largest single source of CO₂, has invested £80M in a processing unit for biomass (wood, straw and other plant based fuels). The unit is designed to produce more renewable electricity than 600 wind turbines, but will operate at only a fraction of its capacity because Drax says it is cheaper to continue to burn coal.

Drax is one of dozens of companies delaying investments in new biomass power stations because of uncertainty over the government's policy on long term subsidies. Hundreds of farmers growing biomass crops may now struggle to sell their produce. Drax's decision will make it almost impossible for the government to meet its commitment to increase the proportion of electricity from renewable sources from 5.5 to 30% by 2020. Renewable energy is a key component of Britain's targets to cut overall emissions by 34% by 2020 and 80% by 2050.

Coal gas exploration bid approved

The UK's Coal Authority has approved a bid by a company to investigate whether underwater coal seams off the Welsh coast could be used to produce gas. The Clean Coal Company wants to use offshore drilling techniques in Swansea Bay. The company says that initial investigations will have no detrimental impact on marine life in the bay.

According to Clean Coal, this would be the first time that the process of Underground Coal Gasification (UCG) to convert the coal into combustible gas used for power generation. The company says initial studies in Swansea Bay suggest there are underground coal reserves of around 200M tonnes - enough it claims to potentially provide all the energy needs of Swansea for 30 years.

Solway Firth underwater coal resources studied

The Coal Authority has also granted permission to examine the UCG potential of coal seams located deep below the Solway Firth. Clean Coal Ltd is to investigate the reserves situated off the coasts of Dumfries and Galloway and Cumbria.

The company has been granted similar permission at Cromer in Norfolk, Humberside, Sunderland and Swansea Bay. It will use offshore drilling technology to carry out its investigations. The work should get under way next year and will take between 12 and 18 months. If sufficient reserves are discovered, the company said it would result in a multi-million pound investment.

USA

Obama's plan for CCS commercial deployment within 10 years

In his State of the Union address, President Obama called for a diverse mix of clean energy sources, including nuclear power plants, renewable energy and clean coal technologies. In February, he established an Interagency Task Force on CCS to speed the commercial development and deployment of clean coal technologies.

The Task Force is co-chaired by the Department of Energy (DOE) and the Environmental Protection Agency (EPA) and must develop by August a proposed plan to overcome the barriers to the widespread, cost effective deployment of CCS within 10 years, with a goal of bringing 5 to 10 commercial demonstration projects online by 2016.

The plan must explore incentives for commercial CCS adoption and address any financial, economic, technological, legal, institutional, social, or other barriers to deployment. This will include considering how best to coordinate existing administrative authorities and programmes, including those that build international collaboration on CCS.

DOE gives funds to clean coal projects

Multibillion-dollar clean coal projects in West Virginia, Texas and Alabama are getting US\$979M in federal stimulus funding. The money will go toward retrofitting existing coal fired power plants owned by American Electric Power, Southern Co. and Summit Texas Clean Energy to capture and store CO₂. DOE is aiming to have the technology available commercially - and to share with other big coal using countries - in 8 to 10 years.

Among the successful applicants is Texas based NRG Energy, to receive US\$154M to create a 60MW facility. Scheduled to begin operating in 2013, the project is designed to capture 90% of incoming CO₂, compress it and use it to enhance oilfield recovery operations.

However, another successful applicant, Southern Co., later informed DOE that it would not pursue expansion of its CCS demonstration project in Alabama, even though the plan had been awarded a US\$295M grant.

French firm pushes carbon capture solution

Eyeing lucrative markets in China, India and beyond, Alstom (France) unveiled the world's largest carbon capture facility at a US coal plant. The pilot facility captures and stores the CO₂ from around 20MW of generation from West Virginia's Mountaineer plant. The unit can handle only a fraction of Mountaineer's 1,300MW capacity, burying the captured CO₂ 2.1km underground.

Alstom said the same technology could be scaled up and attached to any modern coal plant, limiting emissions and, if carbon taxes are introduced as part of eventual climate change legislation, saving the plant's owners money.

The power plant's owner, American Electric Power, said CO₂ emissions are liquefied and pumped into an underground aquifer at a rate of 5.5 tonnes/hour. Alstom aims to have a full scale commercial CCS facility operational by 2015.

Grant awarded for clean coal plant

The US Department of Energy has awarded a US\$350M grant to a company that plans to build a more environmentally friendly coal fired plant in West Texas. Summit Texas Clean Energy LLC is pitching a US\$1.7 billion plant capable of producing 400MW. Summit has said its plant would capture about 90% of the CO₂ produced in coal fired plants and sell it for Enhanced Oil Recovery in the oil-rich Permian Basin.

Siemens and Fluor will start the final design of the plant and Summit will soon file its air permit application. The government said the Bureau of Economic Geology at the University of Texas would oversee the process of capturing CO₂.

NCC study on deployment of CCS technologies

The National Coal Council (NCC) presented the US Department of Energy with recommendations for broad deployment of CCS technologies to achieve an 80% reduction in CO₂ emissions by 2050 with sustained economic and employment growth.

The Council's findings are based on its latest study, "Low-Carbon Coal: Meeting U.S. Energy, Employment and Carbon Dioxide Emissions Goals with 21st Century Technologies," which creates a path to achieve the Administration's goal of reducing CO₂ through widespread and affordable deployment of CCS commencing in eight to 10 years. The Council's approach supports the Secretary of Energy's goal of bringing at least 10 large scale CCS demonstration projects on line in the US by 2016.



The study found that extensive deployment of coal based generation with CCS over the next 40 years would increase US GDP by US\$2.7 trillion, create 28M job-years over four decades from new construction, and support 800,000 permanent jobs related to operation and maintenance of these facilities. The analysis also found that related enhanced oil recovery projects utilising the captured CO₂ could help extract more than 2M barrels per day of domestic oil.

According to the report:

- Construction of about 360GW of coal based generation with CCS at a US\$1.2 trillion investment cost will yield a US\$2.7 trillion GDP benefit.
- Deployment of coal based generation with CCS over the next several decades can replace the existing coal fleet and provide up to 3,000 TWh of electricity per year at affordable rates using 1.7 billion tonnes of coal, based on a recent assessment from the National Research Council.
- Next generation technologies for enhanced oil recovery would create demand for captured CO₂ that is equivalent to the emissions from about 70GW of coal based power for more than 30 years, research at the National Energy Technology Laboratory indicates.
- Coal's carbon content creates a competitive advantage for America. In addition to recovering more oil, CO₂ can be used for value-added opportunities ranging from cement to iron oxide production.
- Near term reductions in CO₂ emissions from the existing coal based generating fleet could be achieved by using retrofit efficiency technologies, partial CO₂ capture technologies or a combination of those technologies.
- Widespread deployment of CCS is the key for achieving long term reductions in CO₂ emissions. President Obama and China's President Hu Jintao jointly are calling for immediate advancement of large scale CCS projects using 21st century technologies to achieve near-zero emissions and CO₂ capture.

The study addresses efficiency improvements; CO₂ capture technologies; pipeline transportation of CO₂; use of CO₂ for producing more oil; injection of CO₂ in saline fields or other deep storage options; regulatory and legal issues; underground gasification and coal beneficiation.

Caterpillar and Exelon join FutureGen Alliance

Caterpillar Inc said in February it will join the FutureGen Alliance to build a US\$1.5 billion near zero emissions coal fuelled power plant to produce hydrogen and electricity while capturing and sequestering CO₂ underground in Mattoon, Illinois. In January, Exelon Corp, the nation's biggest power company, also said it would join the FutureGen Alliance.

The Department of Energy plans to provide more than US\$1 billion to help fund the 275MW project as part of federal efforts to reduce greenhouse gas emissions while keeping coal in the nation's power generation mix (currently 44% of US electricity generation).

The FutureGen project will cost about three times more than a traditional pulverised coal fired power plant. The Alliance expects the IGCC plant will prove the technical and economic feasibility of producing low cost power and hydrogen from coal while nearly eliminating emissions. The FutureGen Alliance's total anticipated financial contribution is US\$400-600M, based on a goal of 20 members each contributing US\$20-30M over a four to six year period.

FutureGen members include subsidiaries of Alpha Natural Resources, Anglo American, BHP Billiton, China Huaneng Group, Consol Energy, E.ON, Peabody Energy Corp, Rio Tinto and Xstrata.

Wyoming's crash programme to develop 'green' coal

In 2008, when California regulators were considering banning imports of coal fired electricity, the Wyoming Governor was asking those regulators under what conditions power produced by Wyoming coal would be "green" enough to sell for premium prices. Wyoming is the biggest coal producing state in the US.

Although the Governor "never got a clear answer", he got the Wyoming Legislature to begin setting up the legal framework needed to support CCS and pushed officials to work with China and Australia on

CCS. He described the issues involved in capturing and storing carbon as a "Pandora's Box" of legal and regulatory questions that had, as yet, no answers. "No one else in the marketplace has as much at stake as we do and no one is likely to act on our behalf."

California's Air Resources Board explained that under current law, utilities in the state can't make long term contracts to import coal fired power. If Wyoming power producers could cut their CO₂ emissions by about half to match natural gas emissions, the utilities might, depending on whether they met pending California regulations. Currently, that Board has a commission pondering how to measure and deal with lower carbon coal generated power.

The Wyoming Governor is promoting a vision for 2020 where the state encourages new coal plants near mining areas that separated CO₂ and then shipped electricity rather than coal out of state. Wyoming would also profit from building pipelines to carry the resulting CO₂ to oil fields and other places where it was buried. More money could come from developing and selling Wyoming burial space to other states that could dispose of their CO₂ by a pipeline system.

A legislator argues that Wyoming would never impose a cap on CO₂ emissions, but if the US or other states did, Wyoming wanted to lead the country in establishing laws that would support and regulate CCS. So far, the Legislature has passed five laws and organised a working committee to study what else might be needed to provide clear answers to business related questions.

Even with twice the cost penalties imposed on CO₂ by pending legislation before Congress, it is argued that burning coal to make electricity will still remain cheaper than alternatives such as nuclear or wind power. Wyoming's huge strip mines are among the most efficient in the world and other nations, such as China and Australia, are already competing for the necessary investments to establish CCS regimes. Wyoming is seen to be "at the forefront" of a handful of states, including Texas and Illinois, that will be competing with each other to attract the capital needed to build the multibillion-dollar infrastructure that CCS will require.

Zurich Financial Services, one of the largest property and casualty insurers in the world, has also been working with Wyoming's effort. The company did a computer analysis of the regulatory needs and liability risks of CCS and saw many similarities to risks the company already insures, among them gas pipelines and the injection of wastes and natural gas into underground reservoirs. In each case, insurers have helped minimise risks by working with regulators and companies to develop safety regulations and to pick the most leak-free disposal sites.

While the US and other countries have launched projects to demonstrate CCS, experts caution that large numbers of commercial scale projects may still be as much as 20 years away. To make them happen, the federal government may have to take on some of the bigger long term liabilities involved, as it does currently with nuclear power plants.

Underground coal gasification projects proliferate

Energy research and consultancy, Zeus Development Corporation observes a rapid rise in the number of underground coal gasification (UCG) projects in recent months. Greenhouse gas emission concerns are prompting power and coal-to-liquids project developers to find innovative ways to manage carbon. Most of the UCG projects proposed currently intend to capture and store carbon emissions either in nearby oilfields for improved oil recovery or exhausted coal seams.

Underground coal gasification offers a third way for producers to convert the energy from coal into electricity, the first two being traditional pulverised coal combustion and integrated gasification and combined-cycle (IGCC) generation.

In the past four months, advancements have been announced at six UCG projects. Developers include India's Oil and Natural Gas Corp. Ltd., Australia's Linc Energy, Carbon Energy, and Cougar Energy, and US Gas Tech and Cook Inlet Region Inc. Abstracts of these announcements can be downloaded from the syngas section of Zeus' Virtual Energy Library.

Duke Energy files cost update for clean coal gasification power plant

Duke Energy said that design modifications and growth in the scope of its Edwardsport coal gasification plant under construction in southwest Indiana are projected to add approximately US\$150M (6%) to the project's US\$2.35 billion cost.

Still to be determined is how much will need to be added over and above the US\$150M as contingency funds necessary to complete a project of this size and type. Duke Energy Indiana said that when most of the project's engineering is complete, the company can provide a more detailed, revised cost estimate. The company will examine future cost projections associated with labour, engineering, procurement and plant start-up.

Fixing other TVA coal ash storage sites

The Tennessee Valley Authority will spend at least US\$1 billion to make improvements to the coal ash storage facilities at 10 of its coal fired plants. That total is in addition to the US\$1 billion cost of cleaning up the massive spill at the TVA Kingston plant.

About 2M of the 3M tonnes of coal ash that slid into the main channel of the Emory River have been removed. The remaining dredging should be completed by next spring. Work will then begin on removing the ash from the rest of the river, inlets and ground. TVA estimates that work will be completed in 2013.

Public meeting set on West Virginia coal-to-gasoline project

West Virginia regulators will hold a public meeting on a draft air pollution permit for a planned coal-to-gasoline facility in Mingo County. Representatives of the state Division of Air Quality will accept comments on the permit and provide information about the project.

TransGas Development LLC announced last year it planned to build the plant near Wharnccliffe. The facility is expected to turn 3M tonnes of coal a year into methanol that would then be converted into as many as 3M litres of gasoline a day. The state Department of Environmental has given preliminary approval to the permit.

Regulators OK Limestone County coal plant permit

State environmental regulators have approved an air pollution permit for a proposed expansion of a central Texas coal fired power plant. Texas Commission on Environmental Quality commissioners approved the permit in Austin that would expand the NRG Limestone plant.

NRG Energy Inc. proposes to build an 800MW generating unit in Limestone County near Jewett, south of Dallas. NRG says the plant would burn pulverised coal to fire its boilers. The project is part of NRG's US\$16 billion plan to add 10,500MW in electricity generating capacity over the next 10 years.

TECHNOLOGY & OTHER NEWS

Tri-State tests new solar-coal electric technology

A small coal fired generating plant in northwestern New Mexico will be used to test new hybrid technology that combines solar and coal generated steam to produce electricity. The 245MW Escalante Generating Station is one of two host sites that California's Electric Power Research Institute (EPRI) chose to test the technology. The other site is a natural gas powered generating station near Las Vegas.

Tri-State Generation and Transmission Association Inc. owns the Escalante plant. Tri-State worked with EPRI earlier this year on a study of the potential and feasibility of combining solar thermal concentrating technology at a coal fired plant to augment electric output, and lower carbon and other emissions at fossil fuel facilities.

Solar thermal hybrid applications can provide a low cost option for incorporating renewable energy into established grids because, rather than build new transmission capability for a stand-alone solar concentrating plant. The steam generated will make electricity through the turbine generator already established at the coal facility. It also eliminates the challenges of siting a new plant and new power block.

These projects will seek to demonstrate a near term and cost effective way to use solar energy at commercial scale. This is a key step along the road toward taking full advantage of technologies to lower the industry's carbon footprint.

Virtual reality training system to help advance clean coal power

Invensys Operations Management announced that the Department of Energy (DOE) will utilise the company's innovative EYESim™ virtual reality training solution as the centrepiece of a new state-of-the-art training centre to assist in the development of new generation zero-emission IGCC power plants with carbon capture.

The IGCC training centre is part of the DOE's initiative to develop new clean coal power plants that burn fuel more efficiently to produce environmentally friendly electric power. Under the terms of the contract, Invensys will provide a full scope, high fidelity, real time dynamic simulator for a generic IGCC plant with carbon capture.

While similar to an immersive 3-D video game, this simulation is derived from powerful software that exactly models the physics of the plant's operations, rather than being based on an artistic rendering.

The DOE will use these simulations in demonstration, education and training services, including IGCC plant operation and control demonstrations, technology familiarisation and hands-on computer based training.

CCS in China

Stanford University's Programme on Energy and Sustainable Development (PESD) recently released a report on "The Real Drivers of Carbon Capture and Storage in China and Implications for Climate Policy". The report examines China's motives for its current programme of CCS demonstration and looks at the strategy required to move CCS towards commercial scale deployment.

The report suggests that one of the primary motivations for CCS demonstration in China is to secure the country's energy future in case of possible future constraints on emissions. Although the report indicates the current CCS demonstration programme may not point towards China fully embracing CCS yet, it reinforces the point that the programme will provide China with the means to rely upon its own coal resources regardless of future developments in domestic and international climate change policy.

The report also points to coal-to-liquids (CTL) as an important early driver for demonstration of the technologies in China. CTL has the potential to reduce China's dependence on oil imports. The report highlights Shenhua's CTL project in Ordos, Inner Mongolia, as one of the first major CCS projects in the country. According to the report, an additional immediate benefit of CTL will be the use of captured CO₂ for enhanced oil recovery (EOR), further allowing China to utilise its own oil supplies.

Although the Chinese Government has provided funding for a number of CCS research and pilot projects, the report suggests that international input and investment will be the primary means of pushing the technologies towards long term commercialisation. Projects such as GreenGen and the Near Zero Emission Coal (NZEC) project are highlighted as current examples of international investment in CCS in China. GreenGen, a proposed coal fired IGCC plant, is the main focus of state funding for CCS in China and is supported by Peabody Energy of the USA. The report sees GreenGen as an important step towards commercialisation of CCS.

The report suggests that international funding instruments such as the Clean Development Mechanism (CDM) will not be able to meet the challenge of widespread CCS deployment in China without additional

direct investment. Even assuming CCS becomes eligible under the CDM and the US develops a CCS methodology for international offsets, this funding source may only account for around 25% of the total CCS investment required annually in China (estimated at US\$25-30 billion). The report therefore suggests that cost-sharing agreements between China and international partners are likely to be the most feasible means of covering the anticipated gap in CCS financing.

The report acts as an important reminder of the effort needed on an international scale to drive CCS in China. It provides key messages that international climate policy and offset schemes must acknowledge the unique conditions that exist within the country. This will be an important step to commercial scale deployment of CCS in what has the potential to be its most important market.

Chinese officials sceptical as foreign firms push CCS

Some industry experts believe that many in Chinese government circles remain uncertain about the economic value of CCS as foreign companies look to Beijing as a technology testing ground. China has two commercially operating CCS sites at power plants in Beijing and Shanghai, and many other demonstration projects are being built - including one at Shenhua Group's coal-to-oil plant in Inner Mongolia.

Shenhua Coal Liquefaction Co. summed up these reservations, saying the "energy penalty" of CCS made the sequestration process self-defeating by transferring emissions elsewhere. "If you bury large amounts of CO₂ underground, you have to lay lots of pipelines, install compression technology - all of which requires a lot of energy itself." The firm's coal liquefaction plant had the ability to bury all 5M tonnes of CO₂ it produces each year, but the procedure would be meaningless if it required more steel and other materials produced at plants that were not making similar efforts to store carbon.

A director of the National Development and Reform Commission said ahead of the recent Copenhagen talks that CCS's expensive installation and running costs represented a "fatal weakness". The energy penalty required to run the technology would amount to around 20-30% of the capacity of an individual power plant, and that overall CO₂ storage costs would amount to around US\$70/tonne. "We are willing to go along with international research, but (CCS) isn't currently our main focus when it comes to cutting emissions."

However, the head of the CCS programme at the Lawrence Livermore National Laboratory in California expected CCS costs to fall to around US\$20/tonne within 10 years and he considered China had a key role. He argues that China may well build several commercial plants before the US or Europe builds their first, and that would have "tremendous opportunity for all countries".

Zero Emission Technology

The European Technology Platform for Zero Emission Fossil Fuel Power Plants (ZEP) is a coalition of stakeholders - companies, scientists, academics and environmental NGOs - united in their support for CCS as a key technology for combating climate change, alongside renewables and energy efficiency.

ZEP was founded in 2005 and has three main goals:

1. Enable CCS as a key technology for combating climate change.
2. Make CCS commercially viable by 2020 via an EU-backed demonstration programme.
3. Accelerate R&D into next-generation CCS technology and its wide deployment post-2020.

In November 2008, ZEP unveiled its proposed EU-wide CCS demonstration programme - a key step toward enabling the commercial viability of the technology by 2020 as requested by the EU heads of state and the G8. This roadmap was instrumental in aiding the EU to agree to co-fund such a demonstration programme in December 2008. With the intention to get up to 12 EU CCS demonstration plants running by 2015, the challenge is now to ensure the necessary conditions; regulations and funding are in place for industry to be able to begin building these demonstration projects by 2011.

New CCS website

This year ZEP embarked on a project to launch a new public website which would seek to engage audiences and stakeholders on the many issues surrounding CCS. The idea was to create a platform where questions could be asked and answers provided, while showing visitors the breadth and depth of the CCS stakeholder community. The website includes three animations that seek to answer the key questions surrounding CCS: 'Why do we need it? - The Hard Facts'; 'How does it work? - Inside CCS'; and 'Can CO₂ be safely stored? - Safe Storage'.

ZEP will be looking at other opportunities to further improve the site, add and update content and ensure that visitors are engaged in the debate about the portfolio of solutions we will need to tackle climate change.

New CCS map

The World Coal Institute (WCI) launched its new website earlier this year which featured a number of new resources, including an interactive map of CCS projects worldwide. To keep the map as accurate and up-to-date as possible, the WCI has partnered with the Australian CO₂CRC, one of the world's leading collaborative research organisations focused on CCS.

The aim of the map is to give a realistic overview of where we are with CCS. It includes projects that are:

- Commercial/industrial scale CCS projects that are operational
- Commercial/industrial scale CCS projects that are in planning

Coal and CCS in the UK

The UK Department of Energy and Climate Change (DECC) published a response document to its consultation on 'A Framework for the Development of Clean Coal'. DECC's response confirms two key aspects of the UK government's CCS policy:

- CCS incentives will fund up to four commercial scale demonstration projects and all new coal fired power plants will have to demonstrate the full CCS chain at a commercial scale.
- A long term plan will be developed for wider CCS deployment from 2020 onwards with all demonstration plants having retrofitted CCS to their full capacity by 2025. This plan will include a rolling review process which will consider a regulatory and financial framework, as well as developing a contingency plan for dealing with coal emissions should CCS not become technically or economically viable within the planned timeframe.

While WCI considered DECC's commitment to a CCS demonstration programme commendable, the decision to only fund up to four commercial scale projects is disappointing as it does not demonstrate the level of commitment required to support the proposed long term transition plan. The WCI's response to the initial consultation recommended that the government should commit to four projects as a minimum.

The UK's Energy Bill was outlined as part of the annual Queen's Speech to open Parliament. The Bill follows on from the Government's Low Carbon Transition Plan and outlines a strategy for reducing the UK's CO₂ emissions by 34% from 1990 levels by 2020 and 80% by 2050.

The Bill states that a levy on electricity suppliers will be used to help fund up to four CCS demonstration plants in the UK and potential retrofitting of these plants to their full capacity should they be required to capture 100% of CO₂ emissions under future legislation. Although progress has been slow on the specifics of the levy, this announcement does begin the process for introducing it as law. CCS is the only technology specifically earmarked for funding under the Bill and is the main focus of the proposed legislation.

Launching the government's CCS strategy, Energy and Climate Change Secretary Ed Miliband said "CCS presents a massive industrial growth opportunity for the UK. And we have some of the best potential sites in all of Europe for CO₂ storage under the North Sea."

The government said it would fund clean coal design and development studies as part of the competition to build one of the world's first commercial scale CCS demonstration plants. The funding will support front end engineering and design studies, which will enable the bidders to further their designs for the projects at E.ON's Kingsnorth and ScottishPower's Longannet coal fired power plants. These studies will be completed within twelve months, after which the final competition winner will be selected. The funding is drawn from a pot of £90M announced in the 2009 Budget. The precise amounts awarded to E.ON and ScottishPower are commercially confidential.

The UK is considered to have the most ambitious commitments on coal generation and CCS in the world. The levy to support four CCS demonstrations would be the first-of-a-kind in the world. If the current government succeeds in passing the levy legislation after the UK election, a competitive process for the three other projects will be launched by the end of 2010.

A cross-party bid to restrict CO₂ emissions from new power stations narrowly failed in the House of Commons in February. Labour backbenchers joined with the Tories and Liberal Democrats in calling for an Emissions Performance Standard (EPS) for every new electricity generating plant. The Energy Minister had warned it would "significantly undermine" plans to tackle climate change because the restriction would deter private companies from investing in CCS technology.

British government funds SSE clean coal pilot

In March, Scottish and Southern Energy was awarded £6.3M (US\$9.45M) in funding for a clean coal project in Yorkshire. SSE's pilot project to capture CO₂ from a small part of its Ferrybridge coal fired power plant will form part of a new CCS economic area covering Yorkshire and Humber.

SSE's Ferrybridge pilot bridges the gap between laboratory scale trials and larger scale projects the government plans to fund from next year. Britain hopes to be able to export the technology to big coal burners like China and India, but some industry observers say China could develop its own CCS equipment more rapidly and cheaply.

World Energy Outlook 2009

The International Energy Agency (IEA) recently launched its 'World Energy Outlook 2009' (WEO). This year's report sees significant changes to the IEA's projections due to the impact the financial crisis has had on global energy markets over 2008/09. This has significantly affected the short-term picture, with 2009 set to see annual global energy use fall for the first time since 1981.

The new WEO assesses two scenarios; the Reference Scenario, which assumes governments make no significant changes to existing policies and the 450 Scenario, which assumes global policy action is taken to limit the long-term concentration of greenhouse gases in the atmosphere to 450 parts per million of CO₂-equivalent (ppm CO₂-eq).

Under the Reference scenario, the report projects the following changes:

- World primary energy demand to increase by 40% (1.5% per year) between 2007 and 2030.
- Fossil fuels to account for over three quarters of the overall increase in energy use between 2007 and 2030, with coal accounting for the biggest proportion of this increase.
- Energy related CO₂ emissions to reach 34.5 Gt (giga- or billion tonnes) in 2020 and 40.2 Gt in 2030, up from 28.8 Gt in 2007.

While the projected levels of emissions are 5% lower in 2020 than those projected in WEO 2008, the IEA still warns that the heavy reliance on unabated fossil fuels witnessed under the Reference Scenario could result in atmospheric GHG concentration levels of over 1000 ppm CO₂-eq. This would also have negative impacts on energy security as countries would become increasingly reliant on imports, particularly of natural gas.

According to the report, stabilising atmospheric GHG concentrations at 450 ppm CO₂-eq will limit the probability of a global average temperature increase in excess of 2°C to around 50%. The 450 Scenario will require:



- Global energy related CO₂ emissions to peak at 30.9 Gt just before 2020, declining to 26.4 Gt in 2030.
- Primary energy demand to grow just 20% between 2007 and 2030 as a result of increased energy efficiency in buildings and industry.

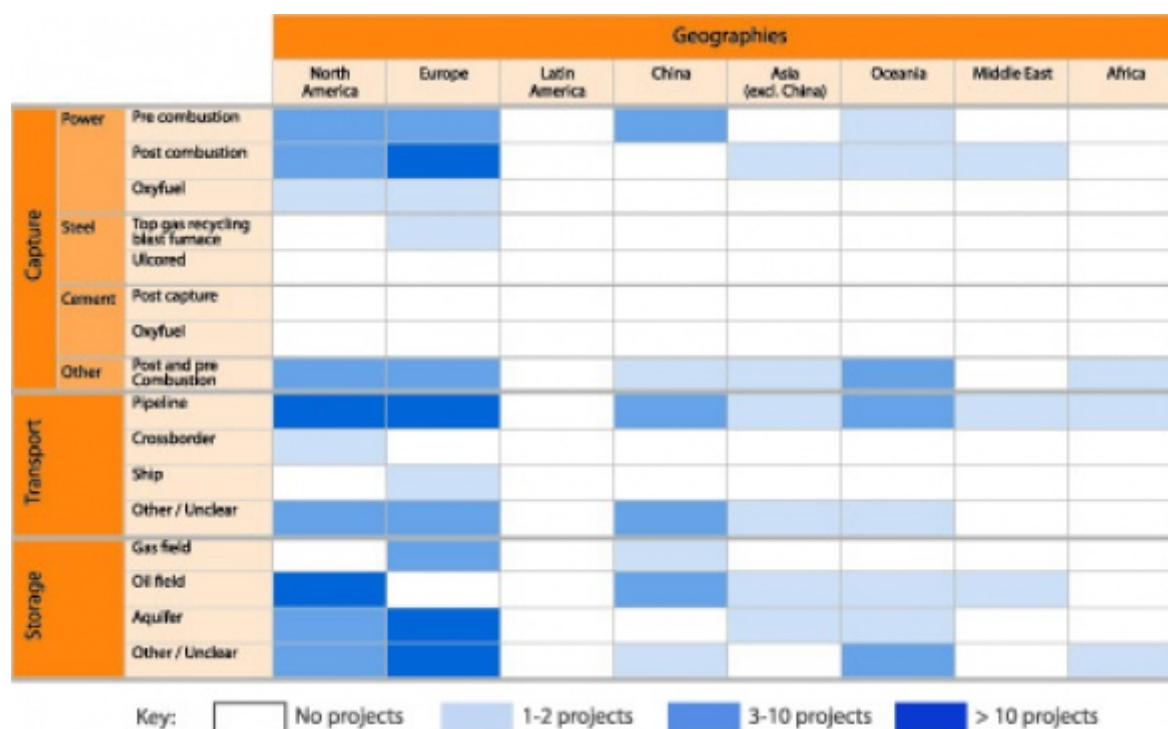
Under this scenario, CCS in the power sector and industry accounts for 10% of emissions savings in 2030 relative to the Reference Scenario. The deployment of CCS will be particularly vital in the US and China, which are projected to account for over half of all emissions reduction in the power sector. Despite the widespread deployment of CCS, coal would be the only fuel to witness a fall in demand between 2007 and 2030, partly due to the increased reliance on gas.

The report warns that the recent fall in energy investment, as a result of the financial crisis, could have a negative impact in terms of energy security, climate change and energy poverty. While the IEA commends the recent clean energy elements of the various economic stimulus packages around the world, it calls for further action to be taken on a larger scale in order to achieve what it calls a 'Clean Energy New Deal'.

GCCSI's ideal portfolio of global CCS projects

The Global CCS Institute (GCCSI) recently outlined the ideal capture, transport and storage options for a global portfolio of CCS projects to cover all regions. It compared these options to 273 CCS projects currently planned or operating around the world in order to identify the key areas and regions in which development and deployment still needs to take place. While planned deployment of the required options is strong in Europe and North America, the GCCSI found that other regions and industries still require a number of areas to be covered.

Comparison of Current Global Status of CCS Projects and a Proposed Ideal Portfolio of Capture, Transport and Storage Options



Source: GCCSI & LEK Consulting (2009) "An Ideal Portfolio of CCS Projects and Rationale for Supporting Projects"



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23-25 Jun 2010, Conference on CSG drilling & completions 2010, Brisbane, Qld., 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/oil-gas/CSG-drilling-completions-2010

19-20 Aug 2010, 6th Coaltrans Australia, Australia, Coaltrans Conferences Ltd., Nestor House Playhouse Yard, London EC4V 5EX, UK, Fax: +44 20 7779 8946, Internet: www.coaltrans.com/EventDetails/0/1171/6th-Coaltrans-Australia.html

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

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/

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

FEEDBACK

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