New King Coal

Paul Moore takes a look at the positive general coal mining and coal demand trends globally; some key developments in the coal equipment supply area; then homes in on four coal hotspots where a number of new projects are underway or in development: Mozambique, Mongolia, Kazakhstan and Indonesia

The global statistics for coal in 2010, published by the World Energy Council and also appearing in BP's 2011 Statistical Review of World Energy, show a marked boost in production from 2009. The top five producing countries – China, the USA, Australia, India and Indonesia saw production increases of 9%, 2.1%, 2.9%, 2.5% and 19.4% respectively. The global production total increased from 6880.8 Mt to 7273.3 Mt, an increase of 6.3% on 2009. By global region, Asia-Pacific accounted for 67.2% of production; North America 15.9%; Europe & Eurasia 11.5%; and Africa 3.5%.

In consumption terms, coal usage grew by 7.6% in 2010, the fastest global growth since 2003. Coal now accounts for 29.6% of global energy consumption, up from 25.6% 10 years ago – a clear indicator that its perceived decline as a dwindling fossil fuel is far from true, and that the majority of countries with significant coal reserves are factoring coal-fired power generation into their energy mix for the long term. In addition, metallurgical coal demand is being driven by record steel production – according to the World Steel Association, total world steel production was 1,413.5 Mt in 2010, up from 1,230.9 Mt in 2009.

The main crushing station at Vale's new Moatize mine in Mozambique

China as always is a major factor, with Chinese coal consumption growing by 10.1% between 2009 and 2010; China in 2010 consumed 48.2% of the world's coal and accounted for nearly two-thirds of global consumption growth. But consumption growth was robust elsewhere as well with OECD consumption growing by 5.2%, the strongest growth since 1979, with strong growth in all regions.

Aside from those mentioned and others such as Colombia, Poland and Canada; new countries in emerging markets are also coming into play in coal production. Activity in Mongolia is rapidly ramping up, through new players such as SouthGobi Resources but also through expansion plans by established state-owned producers. Vale is not the only player active in Mozambique, with a number of other

projects being advanced; making it one of the leading countries in terms of relative levels of coal mining investment for its size. The growth in Indonesian coal production really has been remarkable, almost 20% in only a year.

Equipment consolidation... and new technologies

The most significant news in the coal equipment area is clearly the amount of consolidation that has been going on, which has brought together Joy Global with IMM, a key Chinese longwall and roadheader supplier as well as the leading producer of large wheel loaders, LeTourneau; and the finalisation of Caterpillar's massive buyout of Bucyrus, which is covered in some detail in this month's *World Prospects* pages.

For both surface and underground coal producers, there will be a noticeable reduction again in brands; with Joy Global (including P&H) and Caterpillar making the coal market one dominated by orange and yellow machines going forward. At the same time, not all mining groups like the idea of only one or two suppliers becoming too dominant. Other groups, including Sandvik, Eickhoff, Famur, Kopex and Chinese majors like Sany may benefit from this sentiment; as may alternative suppliers in surface coal mining and overburden removal equipment from such as Hitachi, Sandvik, Liebherr, BELAZ and Komatsu. What will be very interesting is if much larger contracts can be achieved, where one supplier may have whole mine MARC equipment contracts; even surface and underground combined contracts where that may be applicable. With the increased interest in more continuous mining techniques in harder rock; the fusion of companies like Caterpillar-owned Lovat with Bucyrus and its work in this area should mean further progress in R&D. During the integration planning, Caterpillar has already renamed the entire Bucyrus range to align it with its own nomenclature. Some of these new names are shown in the attached table.

The Joy deal in China saw Joy Global and International Mining Machinery Holdings jointly announce today that IMM owner TJCC Holdings had conditionally agreed to sell 41% of IMM;s shares to Joy Global for some $585 million. The move follows the company's 2008 buyout of another Chinese coal equipment player, Wuxi Shengda, another Chinese manufacturer of longwall shearers. Completion is subject to the receipt of necessary approval from China's Anti-Monopoly Bureau of the Ministry of Commerce (MOFCOM) but on receipt of that, Joy Global will also be required to make an offer for the remaining approximately 59% of IMM's shares.

IMM is a leading designer and manufacturer of underground longwall coal mining equipment in China. It has strong domestic market positions in roadheaders and longwall shearing machines, and is growing the share of its armoured-face conveyor and electric control systems businesses. In addition to original equipment, IMM provides aftermarket parts and services through a broad network of service and warehouse locations.

"A core part of our business strategy has been to position ourselves for the high growth of the emerging markets, and the investment in IMM is a major step in the execution of that strategy," said Mike Sutherlin, President and Chief Executive Officer. "The China coal market is large and diverse, and must be accessed with a multi-dimensional strategy. While the major mines generally use globally sourced equipment, a larger number of mines rely on local Chinese mining equipment manufacturers. Leadership in the China market requires strong positions specific to each segment, and IMM is an established market leader in the local market with premier products for longwall shearing machines and road headers. IMM is a very strong complement to our Joy Mining and P&H businesses, and gives us leading positions in each of the major segments of the China market."

International Mining Machinery was formed in 2006 to acquire Jixi Coal Mining Machinery and Jiamusi Coal Mining Machinery. Jixi Machinery is headquartered in Jixi, Heilongjiang Province and is a leading manufacturer of shearers in China. Jiamusi Machinery is headquartered in Jiamusi, Heilongjiang Province, China and is a leading manufacturer of roadheaders in China.

The move came just after the completion of the acquisition of LeTourneau, on which Mike Sutherlin commented: "The acquisition of LeTourneau brings two very strong business platforms to Joy Global. LeTourneau's wheel loaders are the largest and most fuel efficient in the industry and their complementary application to our electric mining shovels will deliver significant synergies." LeTourneau

The newly renamed CAT CM445 continuous miner, formerly the Bucyrus 35M3

Country	Coal production 2009 (Mt)	Coal production 2010 (Mt)
China	2,973	3,240
USA	975.2	984.6
Australia	413.2	423.9
India	556.0	569.9
Indonesia	256.2	305.9

Source: World Energy Council. Includes commercial solid fuels only, ie bituminous coal and anthracite (hard coal), and lignite and brown (sub-bituminous) coal

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already has a close relationship with Vale, and signed a five year global strategic alliance with them in mid-December 2008 under which LeTourneau is Vale's exclusive supplier of large wheel loaders, including all models from the L-950 to the L-2350, and also provides spare parts, maintenance and repair services to Vale worldwide.

In July, Joy also released its new 12ED25 mid-seam simultaneous cut and bolt entry driver, with the first unit shipped to a coal mine in the western US. The mine will use the new machine to develop its longwall gate access roads. The new JOY 12ED25 covers seam heights ranging from 2.7 m to 4.6 m. Simultaneous cutting and bolting on the new machine "boosts productivity and significantly improves work flow and roof control via automated cycles", stated Joy. The system can complete a fully automated cutting cycle of up to a 50 in advance while simultaneously installing up to six roof bolts and eight rib bolts. Cutting cycles can be programmed to suit mine seam conditions and/or to match desired bolting cycles, while minimising dust output.

A CAT branded longwall shearer

Designed for optimum safety and ease of operation, the JOY 12ED25 Entry Driver is equipped with extendable rib protection shields, as well as roof canopies for both roof and rib drill operators. Also, with the ability to increase production and driving rates via semi-mechanized operations, the operator interaction in the working area can be reduced.

The release of the 12ED25 follows numerous successful installations of the Joy low-seam 14ED25 entry driver throughout the Eastern US. The design features of the 12ED25 and 14ED25, as well as all motors, gearboxes, traction drives, conveyor drives, sump frame mechanisms, and roof bolting rigs, are common to both machines.

In Poland, Famur has recently completed delivery of a new FL 12/18 complete low seam longwall mining system to the Murcki-Staszic mine near Katowice, which is part of Katowicki Holding Weglowy (KHW). Despite "extremely hard conditions" prevailing in seams as thin as 1.2 m, Famur states that its designers managed to develop a state-of–the-art machinery complex. Initial work to design the FS200, an original shearer dedicated to thin seams, started as early as in 2007.

The challenge faced was to create a system which would join features of shearers used in medium seams (classical advance) with those

Bucyrus machine type and name	New Caterpillar name
Hydraulic excavators (former Terex O&K)	
RH120E	6030 FS or 6030 (latter is backhoe model)
RH170B	6040 FS or 6040
RH200	6050 FS or 6050
RH340B	6060 FS or 6060
RH400	6090 FS (not yet available as a backhoe)
Rope shovels	
182M	7182
295HD	7295 HD
295HR	7295
395HR	7395
495HD	7495 HD
495HR2	7495
495HF2	7495 HF
Draglines	
W2000	8000
8200	8200
8750	8759
Highwall miners	
Highwall Miner SHM (former Terex SHM)	HW300
Longwall shearers	
Electra 2000 Evo	EL2000
Electra 3000 Evo	EL3000
Electra 4000 Evo	EL4000
Continuous miners	
25MO	CM210
25M1	CM220
25M2	CM230
25M3	CM240
25C	CM235
25CT	CM235 T
30M2	CM330
30M3	CM340
30M4	CM345 N
35M1	CM430
35M2	CM440
35M3	CM445

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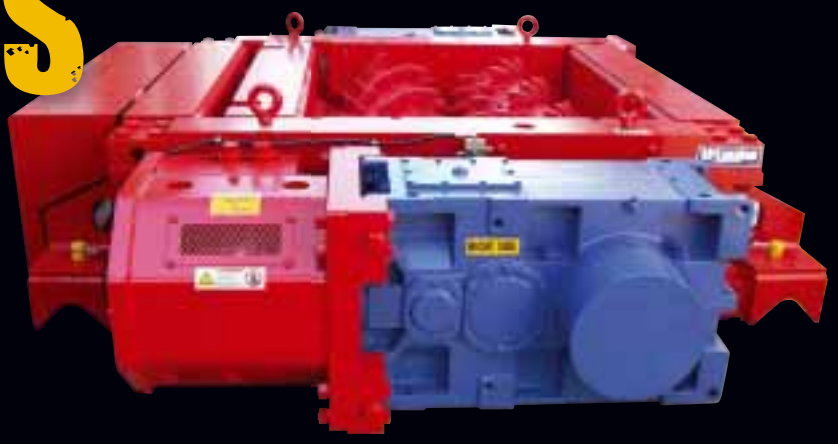

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Lighting on Famur's new state of the art FL12/18 longwall

of a shearer placed by AFC (a solution used in extremely low longwalls). The design was based on some earlier experiences Famur gained when operating the KSE-360 shearer.

One of the major challenges was to ensure small overall dimensions. Small dimensions at very high power concentration demand a unique approach to the question of the arm gear and the haulage system. The chosen solution was a planetary spur gear used in the shearer drive. The electrical system of the machine which was designed from scratch, and an advantage of the machine is the division of the electrical equipment into two individual blocks – a shearer block that is as small as possible – and a supply station block situated in the roadway which contains the sophisticated system for power distribution and auto diagnostics.

A controller set on the shearer communicates on permanent basis with the station controller. The first computer is responsible for execution of the control algorithm, eg motor protection by reduced haulage speed should the threshold current be exceeded, control of the skid and maintaining the shearer's position against the AFC as well as the so-called cut memory, ie a detailed record and automatic replay of the shearer's travel. The second controller manages the contactors, displays the measured station and shearer values and sends them for visualisation. The design will lead in the near future to a fully automated longwall system.

Łukasz Gonsior, part of the new system's design team comments: "Compared to earlier designs overall dimensions of the gear have been reduced significantly, preserving however the nominal load capacity, while the cooling system used proves both, highly efficient and simple to maintain. The gears used in the low seam system have been tested under load to prove their strength."

Test stand load trials exceeded the nominal parameters, and Famur believes as a result that the solution has a competitive advantage over the leading international gear manufacturers.

Integrated with the system is the FFC750 face conveyor, a newly designed unit dedicated to low height longwalls that features a unique pattern of the supplying bus. The bus is hydraulically corrected along the transverse plane and allows for minimal disturbance of the chainless haulage system pitch. Installed on a plate in the longwall or on a base in the top gate, the return drive has a low body and compact design to ensure performance with shields lowered even to 1.2 m.

The output reached a month following the longwall start-up was 2,800 t/d though those in the mine who have observed the performance of the system, expect the potential figure to be as high as 4,000 t/d.

A feature of the low system at this mine is the e-mine concept. It allows not only for visual supervision (surveillance cameras) of the key points of the system but also for monitoring of selected operational parameters displayed as integrated visualisation. It ensures observation of pressure distribution in roof support legs (RSPC), operational parameters of the shearer (FAMAC OPTI) as well as major vibration and temperature records of the conveyor drive (FAMAC VIBRO). All the data is transmitted to a surface Dispatcher Room via optic fibre connections.

Coal equipment wear parts assets have also been changing hands. Leading mining wear parts major ESCO has announced the completion of its strategic acquisition of Hydra Mining Tools International. Headquartered in the UK, Hydra is a preferred provider of underground mining cutting systems for the global coal mining market. In recent years, the company has been very successful in expanding its business in China, the world's largest producer of coal.

The acquisition of Hydra Mining Tools supports ESCO's global expansion and, at the same time, provides a new range of products for underground mining markets. The statement said: "Hydra is an innovative designer, manufacturer and supplier of advanced technology underground mining cutting systems, specialising in shearer drums and cutting tools with carbide inserts, conveyor belts, and other related components. Hydra's focus on underground consumable parts and related capital equipment is well aligned with ESCO's position in consumables and equipment for surface mining.

Hydra's operations include sales and manufacturing in the UK and China, and a sales office in the US. "We are excited about ESCO's acquisition of Hydra Mining Tools and the synergies and global opportunities that it will bring to ESCO," said Cal Collins, ESCO's President and Chief Operating Officer. "This acquisition opens the door for ESCO into the fast growing Chinese underground coal mining markets and positions ESCO for continued expansion into the established underground coal market in the US and Australia. We will leverage the ESCO brand and our expertise in mining wear parts and solutions to better service our customers." With the formal closing of the deal, ESCO welcomes approximately 130 new employees to its workforce of approximately 5,200 globally.

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Indonesia

The Indonesia coal production increase figure is huge, and reflects the global demand for high quality thermal (steam) coal, of which it is the top producer, followed by Australia and Colombia. China and India are the key importers of Indonesian coal. Indonesia also has strong competitive advantages in coal exports because its production cost is the lowest in the world and it benefits from lower freight costs and delivery lead times due to close proximity to the major importing countries in Asia. The Indonesian market is also interesting in that it is dominated by contract mining, and some of its main players are discussed in one of this issue's other major articles which is on that topic.

Leading miner, BUMI Resources, which owns PT Arutmin and Kaltim Prima, states that in 2010, Arutmin's total coal production through its five mines reached 20.4 Mt from 19.29 Mt in 2009, while KPC 's production fell very slightly at the Sangatta and Bengalon mines to 40 Mt from 40.3 Mt in 2009.

Number two Indonesian producer Adaro Energy expects its 2011 coal production to be up 5 Mt from 2010 to 46-48 Mt, and then to increase again to nearly 50 Mt in 2012, while one of the fastest growing smaller groups, Bayan Resources, is aiming to more than double its output to as much as 25 Mt by 2013 to meet rising demand, especially in India. The company produced 11.9 Mt of coal last year and expects output to rise to as much as 15.5 Mt in 2011. Bayan has also signed a deal with India's Universal Crescent Power Private Ltd to supply 100 Mt of coal over 15 years from 2015.

In December 2009, Bayan signed agreements to purchase nine coal concessions in East Kalimantan from PT Ilthabi Bara Utama and Prime Mine Resources. Based on exploration to date, the nine coal concessions have some 116 Mt of coal reserves and 3.8 billion of coal resources. These concessions are strategically located adjacent to Bayan's existing Tabang mines which are already in production. Bayan has also said that it intends to inject these nine concessions into Kangaroo Resources, a publicly listed company incorporated in Australia. KRL would then issue new shares constituting a majority and controlling interest in KRL for Bayan.

Juniors are also active in the country. Pan Asia Corp has moved to the final feasibility study phase for its TCM coal project in Indonesia. This followed the successful completion of an independent study, which showed that the project could viably produce some 1.5 Mt of saleable coal a year, over a 15-year period. "We have now launched into the final feasibility study phase of this project, and its outcomes should prove to be one of the catalysts that significantly rerate the company," said Pan Asia CEO Alan Hopkins. The TCM project currently had a resource of some 52.2 Mt, comprising 22.04 Mt of indicated coal resource and 30.16 Mt of inferred coal resource. Additional drilling is currently under way to improve the confidence in all aspects of the geological information, and to assess the opportunity for an open pit operation in the central west part of the concession. This work would form part of the final feasibility study, along with drilling to provide a status of the north area underground resource as a potential second underground operation.

A haul truck at Kaltim Prima Coal in Indonesia

Jatenergy owns two coal development projects in Kalimantan, Indonesia, which were purchased in March 2011 with the acquisition of an unlisted Australian company, Blackrock Resources Pty. Jatenergy's two Kalimantan coal projects are known as Katingan and Atan Bara. The two projects have been independently reviewed by an independent geologist, and exploration targets have been defined. The Katingan Project is the more significant of the two assets. It comprises a single 5,000 ha tenement located 160 km north-west of Palangkaraya in South Kalimantan. It has a substantial exploration potential, exceeding 40 Mt.

The Atan Bara Project is located in the North Panajam Pasir area of East Kalimantan, about two hours from Balikpapan. The concession is covered by an exploration IUP comprising 200 ha. Atan Bara has a smaller exploration target than Katingan, but its resources are more readily accessible and easily transported because of its proximity to the coast. Jatenergy expects that an early-stage coal mining operation at Atan Bara will commence within nine months.

New domestic power plans are also driving coal demand in addition to China and India. PT Adaro Energy Tbk, Electric Power Development Co and ITOCHU, referred to as the JPower-Adaro-Itochu Consortium, have won an international competitive tender process that ended in April 2011, for a new coal-fired Independent Power Producer (IPP) project in Indonesia. The consortium will construct a coal-fired power plant with a total capacity of 2,000 MW in Central Java Province which will utilise Indonesian sub-bituminous coal as fuel and introduce large-scale boilers that use the environmentally friendly ultra-supercritical (USC) technology which will be the first introduction in Indonesia.

The growth of the Indonesian coal industy has also seen the development of new technology in mining equipment as well as upgrading of existing equipment. Adaro, Komatsu and the Komatsu dealer in Indonesia, United Tractors, have together launched the so-called Bio Diesel Fuel*1 (BDF) Pilot Project in Indonesia. This pilot project aims to ultimately achieve "sustainable environmentally friendly mining operations" in the mining concession area of PT Adaro Indonesia, Adaro's wholly owned subsidiary. In March 2011, the construction of a BDF refinery plant (production capacity 1.2 t/d) and an analysis laboratory to ensure the quality of BDF were completed at the Adaro coal mine, and the production of European Standard (EN 14214)-based BDF from Jatropha*2 (a form of biofuel from the Jatropha plant) has begun. After

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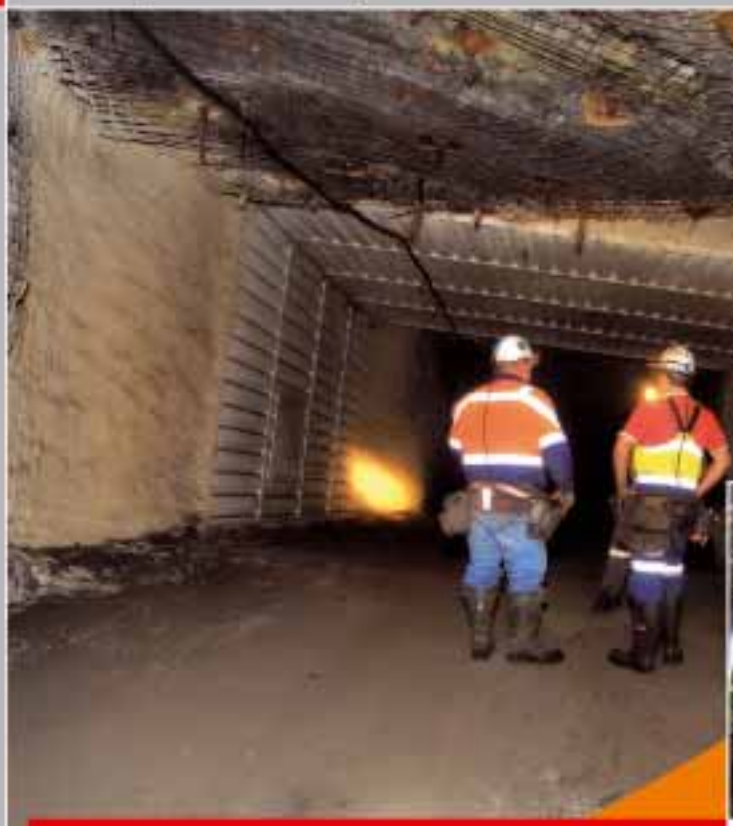

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confirming the performance of an engine using the refined BDF on bench test, the project staff members began test operations of a Komatsu 90t HD785 haul truck at the mine. This project calls for the production of BDF from Jatropha and other plants at the Adaro coal mine in Kalimantan, Indonesia, and the use of BDF as the fuel to run Komatsu-made HD785 dump trucks in operation at the mine. AI plans to outsource the Jatropha and other plants from outside of its operational areas of the mine, to build a BDF supply-chain capable of sustainable local production and consumption, and expects to achieve mine operations with less environmental impact than that of the current mine operations. United Tractors, as the Komatsu distributor in Indonesia, takes responsibility of product support for the Komatsu Dump Trucks fuelled by the BDF. The three partner companies intend to continue to promote this project in order to operate dump trucks on a scale of 100 units in and after 2012. Given that 20% of the currently used mineral diesel fuel will be replaced with BDF to operate them, approximately 8,000 t of BDF will be used annually and contribute to the reduction of approximately 20,000 t of CO_2 emissions which are roughly equivalent to 10% of CO_2 emissions generated by Komatsu manufacturing plants in Japan.

Roberts & Schaefer recently announced that its subsidiary, PT Roberts Schaefer Soros Indonesia, had been awarded the engineering, procurement and construction (EPC) contract to supply and install a new overland coal conveyor and coal stockyard for PT Kaltim Prima Coal (KPC) in East Kalimantan, Indonesia. The new $130 million, 4,500 t/h conveyor system, which will be 13.8 km long, is part of a mine expansion program. New coal stockpiles, with capacity of nearly 1 Mt, will be reclaimed at a rate of up to 7,500 t/h for shiploading. Target completion date of the project is the end of this year, and will be delivered under a full turn-key contract. This latest project is one of many that Roberts & Schaefer has been awarded in Indonesia, including projects in South Sumatra, Central Java, Irian Jaya and Sumbawa. R&S has maintained its operation in Indonesia since 1992.

Also at KPC, Siemens recently announced its biggest mobile mining order from Hitachi Construction Truck Machinery (HCTM) to provide 50 additional EH4500 trucks equipped with Siemens' unique AC-drive technology to the mine, which already has a fleet of 79 EH4500 trucks operating. Clive DeSouza, Mining Trucks Business Manager at the Siemens Industry Solutions division comments: "With this win, KPC will now have the largest fleet of mining trucks with Siemens drives operating in the world. Our reliable, innovative mining truck drive technology, together with a strong service team on the ground, exceeded the machine availability targets. This was critical to the customer placing a repeat order with Siemens." Unlike conventional DC drive technology, AC drives require virtually no maintenance because of its brushless operation. Siemens AC drives also provide higher top speeds and better gradeability. In addition, the Siemens drive technology incorporates several patented safety features such as anti-rollback, which prevents trucks from rolling back on inclines, and slip-slide control, which helps control skidding in wet weather conditions. Another key attribute is the cruise control feature.

Siemens will also provide a permanent on-site service team to assist with the initial operation and long-term reliability of the machines. The trucks are expected to be fully operational by December 2012. When completed, KPC's fleet will include 129 Hitachi EH4500 trucks.

Mozambique

On May 8, Vale celebrated the start of mining activities at the Moatize coal project in the Tete province. This came ahead of the start-up of the processing plant in July. At the moment, Moatize is Vale's biggest project in the coal sector, involving an investment of $1.658 billion to date but with another $4 billion to be invested in the next five years. The mine will have a nominal annual production capacity of 11 Mt of coal. A second phase, beginning in 2014, is expected to double output to 22 Mt/y. The mine's output will be transported 600 km along the Sena railroad to a coal terminal that is being built at the Port of Beira in Sofala province. The mining licence was granted back in 2004, but construction of the mine began on 27 March 2009.

The mine is using a fleet of Caterpillar 793D haul trucks, with one LeTourneau L950 and three L850 wheel loaders; and Hitachi EX5500 excavators at its surface operations. In addition, Vale has ordered ten Cat 797F trucks which will be the first of their kind in Africa when delivered. The Caterpillar fleet is being delivered by South Africa-based Caterpillar dealer Barloworld, which has orders worth $116 million for new units, as well as a $72 million MARC five year contract. According to the group, all the first units (10 x 793D) are delivered and operating, with the site infrastructure establishment proceeding well. An additional 19 Cat 793Ds are due for delivery before the end of this year. A new Bucyrus RH400 (now part of Cat range) will also be delivered by end 2011.

The group has also raised its initial production targets for the mine by 76%. The mine is expected to produce 1.5 Mt in 2011 and output will rise to 6.3 Mt in 2012. The company's previous Moatize estimate for 2011 was 850,000 t. Vale plans to start supplying its clients in October 2011, with most of the output metallurgical coal for steelmaking. Vale, the world's largest iron-ore producer, is expanding its coal mining business to increase the range of products it can offer to steelmakers, its main clients and increase the efficiency of its transport systems. Ships emptied of iron-ore in Asia can be filled with coal in Mozambique for return journeys to Brazil and other steelmaking markets.

ABB, a leading power and automation technology group, won a $32 million order from Vale back in 2009 in Mozambique for complete electrification and automation solutions to maximise productivity, monitor energy use and minimise energy consumption at a new coal mine. Kentz Corp won a US$69 million contract for structural, mechanical, electrical, instrumentation and piping work for the coal processing plant, which will ultimately have the capacity to handle 26 Mt/y of coal.

QMASTOR was selected by Vale for the provision of its Pit to Port, SMS3D and iFuse systems for installation at Moatize. The project covers software licensing, project services and software maintenance and support for an initial five-year period. QMASTOR will supply Vale with a comprehensive pit to customer management information system that includes raw coal production; clean coal production; stockpile and quality management across the supply chain; transportation management of trains, conveyors and trucks; trans-shipment and export shipping management; despatch demurrage management; coal sales contract management; as well as several system interfaces for automated data transfers including Vulcan, Modular DISPATCH, ABB Knowledge Manager Historian, VeriLIMS, Unilog and SAP. QMASTOR Chief Operating Officer, Steve Maxwell, said "QMASTOR is pleased to extend our relationship with Vale into their coal division. The selection by Vale at Moatize highlights QMASTOR's capacity to rapidly deliver a functionally rich solution for managing commodity quality and logistics in this major new coal province within southern Africa. This Portuguese based multi-lingual solution provides QMASTOR with a springboard to rapidly extend our market share in Mozambique and also in Brazil."

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Moatize is by no means the only coal play in Mozambique, thought it certainly has the highest profile. Nippon Steel Corp (NSC) has acquired a 23.3% economic interest in the Revuboe coking coal project in Mozambique from its affiliate Nippon Steel Trading Co (NST). NST currently holds a 33.3% interest in the coal project, while Korean steel company POSCO and Australian resources company Talbot Group hold 7.8% and 58.9% interests, respectively. A feasibility study on the project will be completed by the end of next year and production is expected to start in 2014 or 2015. With the participation of NSC in the Revuboe project, NSC and NST said they will jointly accelerate the development of the 5 Mt / y coal mine, aiming to strengthen the NSC's metallurgical coal procurement base. Initial development is expected to start in 2012. Nippon Steel aims to acquire 1.7 Mt / y of high-grade hard coking coal from the US$600 million project after the mine starts production in 2014 or 2015. That will account for a quarter of its annual need for hard coking coal of 12 Mt, now supplied mostly by Australia.

ASX-listed Riversdale Mining has a combined tenement size now held by Riversdale is in excess of 250,000 ha in the Tete-Moatize area, with coal resources identified now totalling 13 billion tonnes according to the company, located mainly in the Benga and Zambeze coal projects. The Benga Project is a joint venture between Riversdale (65%) and Tata Steel (35%). Construction of Stage 1 (ROM 5.3 Mt/y) has commenced and is expected to be completed in the second half of 2011. With sufficient coal reserves, a recent capital raising and all development approvals secured for a 20 Mt ROM per year operation, a feasibility study has commenced to confirm the economic viability of this expanded operation. Riversdale also completed its first independent coking coal quality tests with large steelmakers, which confirmed that Benga's coking coals are equal in quality to Bowen Basin

A contract for open pit mining was signed with South Africa's MCC Contracts, which covers the mining and associated services required for the initial Stage 1 development of the project. MCC was also supplied with Cat equipment by Barloworld, and has six 793Ds running with a further seven to be delivered by September 2011. The Coal Handling and Processing Plant (CHPP) design, supply and construction contracts were finalised and awarded to Sedgman, a leading provider of mineral processing and associated infrastructure solutions to the global resources industry.

At the Zambeze project, adjacent to the Benga Coal Project, a larger coal resource of 9 billion tonnes has been identified. The Zambeze Project is similar in structure to Benga with 22 coal seams outcropping over a strike length of 14 km across the northern portion of the tenement. In June 2010 Riversdale signed a non-binding MoU with China's Wuhan Iron and Steel (WISCO) and a logistics partnership agreement with the China Communications Construction Company (CCCC) for the development of the Zambeze Project. The MoU provides for the acquisition by WISCO of 40% of the Zambeze Project for a total consideration of $800 million.

Elsewhere, Coal India has again sought bids from local and overseas companies to explore its two coal blocks in Mozambique, the world's largest coal producer said. The state-run company has also separately sought bids to prepare an environment management report of the two blocks, prior to the start of exploration. The tender for exploration of the blocks followed the cancellation of the last bidding process in June. Coal India acquired the two coal blocks in Mozambique with estimated reserves of more than one billion tons in 2009. The company, which is facing hurdles such as delays in environment clearances and problems in land acquisition in

A Terex NHL 4400AC truck operating at Ovoot Tolgoi in Mongolia

The company has also just announced that the Mineral Resource Authority of Mongolia (MRAM) has issued a mining licence for its wholly-owned Mongolian operating subsidiary SouthGobi Sands LLC. The new license pertains to a resource previously disclosed by the company under NI 43-101 standards as the Soumber Deposit. The Soumber Deposit is approximately 20 km east of Ovoot Tolgoi. An independent NI 43-101 resource estimate for Soumber was prepared in January 2011 by Minarco-MineConsult, which estimated 61.4 Mt of measured and indicated resources and

increasing local output, is looking to buy stakes in overseas mines and ship the coal back to India to bridge a rising supply gap.

India's Jindal Group subsidiary, Jindal Resources (Mozambique) Ltd, has been awarded a coal block for prospecting and exploration. The company has been allotted Block-2 in the Moatize district of Tete Province. The licence for exploring the block covers an area of 1,480 ha, estimated to possess reserves of around 150 Mt. The block is situated near the Moatize rail head, connected to Beira port by rail. The company also said another subsidiary, Jindal Metal and Mining, had entered into a joint venture agreement with a Mozambique-based company for prospecting, exploration and mining of coal. This block is estimated to contain thermal coal reserves of around 300 Mt.

Mongolia

Like Indonesia, Mongoia has an eviable position given the quality of its coal reserves and its positon adjacent to China, the world's largest consumer. Mongolia's coal production doubled last year to 25 Mt to become the nation's top export earner, ahead of its copper and fluorspar industries and spurring the government to push through development of mines.

SouthGobi Resources is the leading publicly listed producer with the Ovoot Tolgoi mine, some 40 km from the Chinese border. It mainly produces metallurgical coal, and from start-up in late 2008 to end-2010 it sold 4 Mt, with 2.5 Mt produced in 2010. The mine now operates a fleet of two Liebherr 996 and one Liebherr R9250 hydraulic excavators, with five Terex NHL (North Hauler) 218 t 4400AC trucks and a fleet of smaller Terex TR100 trucks. There is also a project below the mine called Ovoot Tolgoi Underground, which extends down to 600 m and is included in the current mining licence.

One of two Liebherr 996 excavators at Ovoot Tolgoi

65.8 Mt of inferred resources. The coal resources are classified as bituminous coal and the rank ranges from low-volatile bituminous coal to medium-volatile bituminous coal, based on ASTM standard D388. Calorific values range between 5,000 kilocalories per kilogram to 7,800 kilocalories per kilogram. The new 10,992.92 ha mining licence is granted for an initial term of 30 years with an option for two 20-year extensions. SouthGobi plans to complete a Pre-Feasibility Study on Soumber and include the inaugural reserve report when it updates resources and reserves during 2012.

Lucky Strike Resources has retained Norwest in Salt Lake City to prepare an NI 43-101 compliant Technical Report on its 80% owned CN Coal Properties covering six mining exploration licenses located within the Choir-Nyalga coal basin of central Mongolia. The CN Coal Properties are contiguous, comprise an aggregate area of 13,096 ha and are located approximately 170 km from the Trans-Mongolian Railway.

Norwest has been engaged to provide a preliminary assessment of the reportable coal resource estimates based on the results of a 2,000 m exploration drill program supervised by Norwest in 2009 on three of the six CN coal properties. This data has not previously been interpreted.

Hunnu Coal, listed in Australia, has announced that the Mineral Authority of Mongolia has granted it a mining licence for the Tsant Uul Project, covering a total area of 69,233 ha. The company is targeting commencement of mining in the last quarter of 2011 and an initial production of 1.5 Mt of coal in 2012 and 3 Mt in 2013. The owner operator mining fleet is currently being purchased with initial purchases including six Caterpillar 773 trucks and a Hitachi EX1200 excavator. Exploration and development drilling now totals 56,101 m of diamond drill core and RC since discovery of the Tsant Uul Deposit in the middle of 2010. A study for a coal haulage access road from the Tsant Uul mine site to the existing coal haulage road has been completed and is currently under a government approval process. The Tsant Uul Project mining licence has been granted for an initial term of 30 years with an option for twenty years extension twice, providing a total of 70 years of mining operations.

Tsant Uul Project is located in the South Gobi Coal Province of southern Mongolia, approximately 40 km to the south of the giant Tavan Tolgoi coking coal deposit. The Tsant Uul Project has a current JORC compliant resource

of 90 Mt, with 61 Mt in the Measured and Indicated categories.

The two largest mines in the country, Baganuur and Shivee-Ovoo, are majority state-owned. Initially founded as Shivee Ovoo Mine in 1990, Shivee Ovoo JSC is the second largest coal producer in Mongolia. The company mines brown, sub-bituminous coal with a high moisture content. The Shivee Ovoo brown coal deposit is located 260 km south-east of Ulaanbaatar in Shivee Gobi Soum, Gobisumber Province, beside the Trans-Mongolia railway line. Shivee Ovoo JSC mined 1,767.2 Mt of coal, sold 1,671.1 Mt and removed 6,247.1 million ha of overburden in 2010.

Baganuur JSC operates the largest open pit coal mine in Mongolia, which satisfies 50% of Mongolia's total coal demand and 70% of the coal demand of the Central region. The Baganuur mine is located 139 km from Ulaanbaatar and has the capacity to extract 3 Mt of brown coal annually. As one of the three large coal mines in Mongolia, Baganuur along with Shivee Ovoo provides most of the coal used by the five combined heat and power plants in Ulaanbaatar, Darkhan, and Erdenet as well as by the country's main industries and small consumers.

It was recently announced that China Shenhua Energy, Peabody Energy and a Russian-Mongolian group had been picked to develop Tavan Tolgoi, potentially the world's largest untapped coking coal reserve. The reports quoting a Mongolian government statement said that a Shenhua-led group will get a 40% share in the project, while Peabody will hold 24% and the Russian- Mongolian venture 36%. However, there have been conflicting reports since that additional talks are ongoing, as Mongolia apparently picked a newly formed Russian-Mongolia consortium and excluded Korean and Japanese firms. The head of state-owned Erdenes MGL, which owns the Tavan Tolgoi deposit, said talks were still continuing.

The first module of the Coal Handling and Preparation Plant (CHPP) at Energy Resources' Ukhaa Khudag (UHG) metallurgical coal mine has recently been successfully commissioned by the State Professional Inspection Authority of Mongolia. The official opening of the CHPP took place on June 11, 2011. Comprised of three processing modules and a single product handling system, the CHPP is the first of its kind in Mongolia and one of the most advanced in Asia. The first module of the CHPP has the capacity to process 5 Mt/y ROM coal. By processing raw coking coal, it will produce washed coking coal for export with 8-10% ash content as well as thermal coal for the on-site power plant. The design and construction management of the CHPP was undertaken by Australia's Sedgman, the already mentioned leading player in coal processing and material handling technology. The entire construction process took approximately 11-12 months with the mine owner stating that "comprehensive, effective and fast-paced progress was achieved by adopting international best practices in contracting and construction management."

The CHPP was designed to maximise the coking coal yield and utilises modern equipment of well-known brands such as McLanahan, Outotec, Ludowici, Decanter USA, FLSmidth Krebs, Xstrata Technology, Sandvik and Eriez Magnetics. The project has involved total of approximately 600 workers from over 20 different contractors and the CHPP will work on a two shift basis employing 96 staff. The Company has already commenced construction of the second module of the CHPP which will double the processing capacity. The 2nd module is planned to be completed and commissioned by the 4th quarter of 2011.

The process includes two stage dense medium cyclones (DMCs), spirals and flotation circuits. The primary coking coal product will be exported, and the secondary thermal coal product will be used locally. The raw coal will

The Atlas Copco DML Electric SN8460 rotary drill working at the Borly Coal Molodezhniy mine in Kazakhstan

be deslimed at 1.5 mm. Oversized material is fed into the primary DMC. The overflow of the DMC will be dewatered in 1,500 mm centrifuges and will produce coarse coking coal. The underflow of the primary DMC will report to the secondary DMC. Overflow will be dewatered and thermal coal is produced. The underflow will report to the reject conveyor via the a D/R screen. Underflow of the desliming screen will be classified at 0.25 mm in cyclones and sieve bends. The classified oversize will be separated in spirals. The spiral product will be dewatered in fine coal centrifuges and will report to the coking coal product. Spiral reject will be dewatered on the HF Screen and will report to coarse rejects. Classifying cyclone overflow will be separated in a Jameson Flotation Cell. Flotation concentration will be dewatered in screen bowl centrifuges and will reports to the coking coal product. Flotation tailings will be thickened and pumped to a tailings dam. An Australian electrical installation solutions provider, O'Donnell Griffin, was subcontracted to Sedgman for electrical works on the project. "We've done many coal wash plant installations with Sedgman in the past and we have a very strong working relationship. They knew the quality of our work was high and they knew we could immediately provide the level of human resources required, so they came straight to us to run this project. The high voltage reticulation is complete, the structure is in place, and power has been introduced into the main switchboard," said Project Manager, Stephen Jago, adding "Mongolia is a new mining hot spot and the local tradesmen don't quite have the necessary specialised skills yet. Our engineers helped guide the local workers in their day-to-day tasks, giving them the skills and advice they needed to keep the project running smoothly. The plant is Australian-designed and needed to be built according to stringent specifications, so we needed to show the locals how to rig and wire the installation correctly."

Kazakhstan

Most coal production in Kazakhstan is sourced from two main basins, the Karaganda Basin, which supplies metallurgical coal from both surface and underground mining operations and the Ekibastuz Basin, which supplies coal to the power generation sector from mainly open pit operations. Coal production is expected to reach 134 Mt/y by 2015 and 151 Mt/y by 2020.

Several of the new power projects in Kazakhstan are for new coal-based generation capacity. Major projects include the expansion of the Ekibastuz GRES-2 power plant; plans to upgrade the Ekibastuz-1 plant and to build a new coal-fired power station near Lake Balkhash. Small coal-fired thermal power plants and CHP (combined heat-and-power) plants are also being rebuilt.

While most of the coal produced in Kazakhstan is used internally either to generate electricity or for the metallurgical industry, there are also plans to increase exports from their current level of 20-22 Mt/y at present to 32 Mt/y in 2014. This is due to the fact that a number of thermal power capacity expansion initiatives are underway in both Kazakhstan and Russia, so the coal producers will also be ramping up output, for which they have the resources.

Eurasian Natural Resources Corp (ENRC) is one of the largest producers of electricity and coal in Kazakhstan. It operates the Vostochny open-pit coal mine and has a 25% interest in Shubarkol Komir JSC, a major thermal coal producer in Kazakhstan, with production of 5.8 Mt in 2010. Overall, ENRC produced 20.1 Mt in 2010. Strong demand from the industrial and power sectors impacted coal output in Kazakhstan, which increased 12% in 2010. The Energy Division's total sales of coal to third parties nevertheless fell 4.3% in 2010, due to growth in the group's internal consumption.

Aside from internal use, ENRC sold 3 Mt of coal to third parties domestically. Russian utilities increased their coal imports from Kazakhstan, which was prompted by a rise in electricity generation in Russia in response to the improving economy and a rise in industrial demand. Some 3.9 Mt of coal were sold to Russia in 2010.

As of 1 January 2011 and based on JORC guidelines, SRK reported that Shubarkol had 1.377 billion tonnes of measured and indicated coal resources within its coal lease, of which there were 0.344 billion tonnes of probable coal reserves. Shubarkol's coal has a low ash content and high calorific value. A call option gives ENRC the right to acquire the outstanding 75% of the ordinary shares of Shubarkol for a consideration of some $600 million. In January 2011, this call option was extended to the end of January 2012.

Bogatyr Coal LLP has a 70% share of the coal volume mined in the Ekibastuz Coal Basin. In the first nine months of 2010, the company, a joint enterprise of the Kazakshtani JSC Samruk-Energo and the Russian company RUSAL, sold 27.3 Mt of coal – 17% higher than the level of sales for the same period of 2009. There was an increase of shipment volumes to domestic power plants due to the increase of coal consumption by the two largest power plants in Kazakhstan – Ekibastuz GRES-1 LLP and JSC Station Ekibastuz GRES-2. These power plants used over 6 Mt of Bogatyr coal for power generation in 2010 during this period, 61% higher than the last year results.

The leading Bogatyr coal consumer in Russia is the Refta power plant, followed by the Serovskaya GRES plant, which used about 1.16 Mt in the first nine months 2010 from Bogatyr against 824,000 t in the same period of 2009. While the results have not been released yet, the company planned to have shipped 38 Mt of coal for the full year 2010. Production is expected to almost double to around 55m t/y by 2020. Bogatyr Mine is divided into two complexes – Bogatyrskey (the Bogatyr mine itself) and Severny, the oldest mine in Ekibastuz coalfield. The company is in the process of upgrading its equipment to include

new hydraulic excavators, mine trucks, conveyors and wheel loaders. Coal is blended at the blending yard; it is shipped from stockpile to railway cars by bucket-wheel excavator.

Bogatyr mine has a fleet of five Atlas Copco blasthole rigs on site, three DML and two DM45. Each DML drills around 14,000 m per month while the DM45 achieves about 20,000 m per month, both types operating on 25 m benches. The DML rigs use 228 mm tricone bits while the DM45 uses 171 mm tricone bits and all of the rigs are capable of producing more drill metres if required. With a 7 m burden and 5 m spacing, each blast consists of 400 holes to produce more than 100,000 t of coal and 60,000 m^3 of waste per day.

While better known for its copper mines, Kazakhmys through division Kazakhmys Power has a 50% interest in Kazakhstan's largest coal fired power plant Ekibastuz GRES-1 and for strategic supply to that plant also owns the Maikuben West coal mine in northern Kazakhstan.

Kazakhstan is a major coal fired power plant operator, driving domestic coal development

It also has two captive power plants, which run on coal from two captive coal mines in Borly, each with reserves that will last for over 50 years. In 2010, the mines produced 8.1 Mt, which were transported to the plants using its own railway system. Borly, located in the Karaganda region, includes the Molodezhniy and Kulchek mines. It uses both Atlas Copco DML and DM45 rigs on 45 m benches, drilling around 17,000 m per month per rig, although the rigs have the capacity to operate at 20,000 to 25,000 m per month. The DML drills a 228 mm hole, while the DM45 drills a 200 mm hole using Secoroc Epsilon bits lasting 15,000 to 18,000 m. Borly also has the distinction of having received the world's first electric DML drill rig.

ArcelorMittal has eight coal mines in the Karaganda region providing the Temirtau steel plant with captive coal, and plans to increase production from 10.8 Mt in 2010 to 13 Mt / y from 2015 onwards. This added capacity in coal will support the planned expansion of the steel plant's capacity from 4 Mt to 6 Mt / y of liquid steel. The company plans to invest around $300m into the expansion of its coal capacity between 2011 and 2015. ***IM***