COAL

A review of South Africa's coal industry
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List of abbreviations

Ahrlac	Advanced High Performance Reconnaissance Light Aircraft
Africary	African Carbon Energy
AMD	acid mine drainage
Amplats	Anglo American Platinum
Becsa	BHP Billiton Energy Coal South Africa
BEE	black economic empowerment
BFS	bankable feasibility study
CoAL	Coal of Africa Limited
CoM	Chamber of Mines
CSA	coal supply agreement
DFS	definitive feasibility study
DMR	Department of Mineral Resources
FET	further education and training
GTL	gas-to-liquids
HEI	Haohua Energy International
IEA	International Energy Agency
IPP	independent power producer
JV	joint venture
LoM	life-of-mine
MDS	Market Demand Strategy
AMSA	ArcelorMittal South Africa
MoU	memorandum of understanding
PFS	prefeasibility study
RBCT	Richards Bay Coal Terminal
Resgen	Resource Generation
RoM	run of mine
SACRM	South African Coal Road Map
SNR	Strategic Natural Resources
Synfuels	synthetic fuels
TFR	Transnet Freight Rail
TNPA	Transnet National Ports Authority
TPT	Transnet Port Terminals
UCG	underground coal gasification
Wits	University of the Witwatersrand

Units of measurement

The distinction between tonne (1 000 kg) and ton (1 016.047 kg) is maintained in this report according to the information that is reported in the public domain by each company.

Key developments

June 2012: State-owned power utility Eskom agrees to a capital-sharing arrangement with mining group Anglo American for the proposed greenfield New Largo coal mine, in Mpumalanga.

August 2012: South Africa and Swaziland sign a memorandum of understanding reaffirming their support for a cross-border rail connection that will expand rail capacity for the transportation of coal.

August 2012: Wescoal announces a four-step transaction with Xstrata that will increase its life-of-mine by 15 years in the medium term.

September 2012: Forbes & Manhattan Coal agrees to buy two anthracite coal assets from Rio Tinto subsidiary Riversdale Holdings for R440-million.

September 2012: Wescoal clinches a R700-million deal to supply power utility Eskom with 3.2-million tons of coal from its Khanyisa and Intabane mines, in Mpumalanga.

September 2012: South Africa's Department of Mineral Resources gives its approval for Continental Coal to expand operations at its Ferreira coal mine, in Mpumalanga.

October 2012: South African Coal Mining Holdings places operations at its Umlabu colliery, in Mpumalanga, on care and maintenance.

October 2012: Coal of Africa Limited experiences a six-week strike at its Mooiplaats colliery, in Mpumalanga, resulting in the company declaring force majeure.

November 2012: Continental Coal delivers its first production from the Penumbra thermal coal mine, in Mpumalanga.

December 2012: Universal Coal secures a major shareholder, with Coal Development Holdings, a wholly owned investment vehicle of the African Minerals Exploration and Development Fund, taking a 29.99% stake in the company.

December 2012: Firestone Energy receives an off-market takeover offer from Range River Gold.

January 2013: Coal of Africa signs a memorandum of understanding with energy trader Vitol Group, appointing it as the company's exclusive marketing agent for its export thermal and coking coal for eight years.

January 2013: The Richards Bay Coal Terminal confirms that the building of a sixth phase, which could bring capacity to 110-million tonnes a year, is under consideration.

February 2013: Forbes & Manhattan Coal cancels an acquisition agreement with Riversdale Mining after the takeover target's Zululand Anthracite colliery underperforms.

February 2013: Resource Generation starts construction activities at its $630-million Boikarabelo coal mine, in Limpopo.

March 2013: Exxaro experiences labour action at its coal mines and warns that Exxaro-supplied power stations may face coal supply challenges.

March 2013: Continental Coal completes the $10-million sale of its shareholding in the Vanadium and Magnetite Exploration and Development Company to a Chinese buyer. The proceeds are used to buy the minority interests in Mashala Resources that Continental does not already own.

March 2013: Coal of Africa continues with its efforts to dispose of its noncore thermal coal mines in Mpumalanga.

March 2013: Exxaro adds R700-million to the cost of expanding the Grootegeluk Medupi coal operations, in Limpopo, as labour unrest, scope expansion and steel shortages weigh on the capital expenditure of the project. This brings the cost of the project to R10.2-billion.

March 2013: Coal of Africa Limited concludes a deal with Beijing Haohua Energy Resource subsidiary Haohua Energy International for the formation of a strategic partnership.

April 2013: Range River improves its takeover offer to Firestone Energy shareholders.

April 2013: Wescoal reports that it is set to start mining at its Intibane colliery, in Mpumalanga, following the receipt of all necessary approvals, including a water-use licence.

April 2013: Universal Coal increases its ownership of the Cygnus portion of the Berenice coking coal project to 50%.

May 2013: Continental Coal confirms the completion and financial settlement of a strategic financing transaction with diversified miner Village Main Reef, which results in Village acquiring a 16.34% stake in the coal group.

June 2013: Coal of Africa Limited announces the closure of its Mooiplaats colliery, in Mpumalanga.

Key developments

June 2013: Wescoal acquires a coal trading business from an undisclosed third party for R79-million in property, movable assets and goodwill.

June 2013: ZYL decides not to continue with the acquisition of the Mbila anthracite project, in KwaZulu-Natal, cancelling an associated capital raising.

June 2013: Universal Coal pushes forward the development of its A$46.8-million Kangala thermal coal operation by two months, with production now slated for February 2014.

June 2013: Resource Generation announces that it is aiming to raise A$62.6-million to start major construction work at its Boikarabelo project, in the Waterberg region of Limpopo.

July 2013: ZYL retrenches the majority of its South African employees in an effort to "significantly reduce" its corporate overheads in the country.

August 2013: The South African Coal Roadmap, a long-awaited document that explores the interventions required for the domestic coal industry to maximise the commodity's contribution to the South African energy mix, is released.

The Richards Bay Coal Terminal, in KwaZulu-Natal, is the single-largest export coal terminal in the world

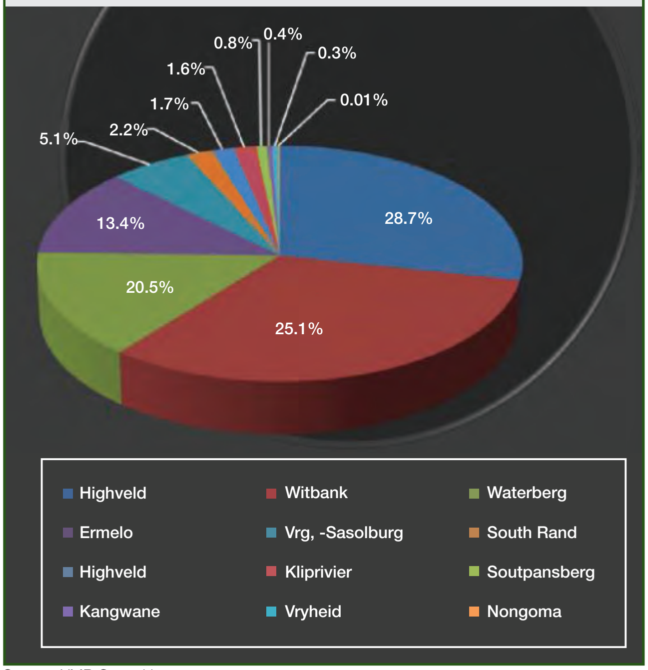
Source: Richards Bay Coal Terminal

Business environment

The coal mining industry is of major significance to the South African economy. The mineral is the major source of energy in the country, accounting for more than 90% of electricity production, 70% of primary energy production and 30% of petroleum liquid fuels.

Further, coal is one of South Africa's leading mineral revenue generators. In 2012, revenue from coal reached R96-billion, making it the country's most important commodity by sales value. This revenue surpassed platinum sales, although it should be noted that this was more a result of poor performance in the platinum industry than any significant increase in coal production. Sixty per cent of South Africa's 2012 coal revenue was from export sales, showing that coal is a valuable source of export earnings and contributes to improving South Africa's trade balance. The coal industry employs more than 70 000 people and pays about R14.1-billion in wages.

South African coal reserves, 2011



Source: XMP Consulting

South African coal production is relatively static, at about 250-million tonnes a year. While significant, and sufficient to place the country among the top ten coal producers in the world, it is only a very small fraction of what is produced in China and about a quarter of what is produced in the US. Other major global coal producers include India, Australia and Indonesia.

South Africa is also ranked among the top ten countries in terms of coal reserves. South Africa's Council for Geoscience is completing a revised reserves and resources statement. Until that becomes available, the best estimate of reserves is based on the 1982 De Jager report assessment, less estimated depletion through mining.

Coal mining currently takes place in about seven coalfields in the country, but is concentrated in Mpumalanga, in the Central basin, which contains the Witbank, Highveld and Ermelo fields. There are also operations in Limpopo's Waterberg and Soutpansberg coalfields, and in the Free State. In addition, there are several anthracite mines in KwaZulu-Natal.

The Witbank, Highveld and Ermelo coalfields are expected to remain the backbone of South Africa's coal industry in the coming years, and the Central basin is believed to have sufficient coal reserves and resources to grow total exports to a peak of 90-million tons a year by 2023. However, as these reserves deplete, attention will turn to some of the country's other coalfields. Production from Limpopo's Waterberg, Soutpansberg and Tuli coalfields is likely to increase substantially, with these fields having not yet been exploited to their full potential.

The Waterberg, in particular, is expected to become a new hub of coal mining activity, with the area believed to represent South Africa's single biggest opportunity for coal mining growth. The Grootegeluk mine is currently the only operation in the Waterberg. However, the coalfield, which consists of largely untapped resources, is being explored by several companies for steam and metallurgical coal, and several new Waterberg mines are reported to be in the planning and conceptual stages.

There are, however, several obstacles to the large-scale development of the Waterberg. The region's coalfield has thick seams, embedded in siltstones and shales, making extraction more difficult and requiring higher input costs. The Grootegeluk mine has shown that the region requires difficult bench mining along the lines of a metalliferous quarry, but with each bench being of a different coal type and quality. Complex coal processing and marketing are required.

The Waterberg also has a shortage of water, which is necessary for the treatment of coal, and lacks the infrastructure required to facilitate the process of coal mining on a significant scale. Transport infrastructure, in particular, is deemed a problem, with the region having inadequate road and rail facilities. To resolve these challenges, transport utility Transnet is pursuing a project to build heavy-haul rail capacity aimed at unlocking the coal resources of the region.

The principal market for Waterberg coal will be power utility Eskom, which is facing coal supply shortages in the coming years. In part, Eskom's anticipated supply shortages are tied to an emerging tension between local and export demand for coal. The utility has also expressed concerns regarding future coal prices.

In August 2013, almost five years after its inception, Eskom, coal producers, government and the Fossil Fuel Foundation launched the South African Coal Road Map (SACRM), a long-awaited document that explores the interventions required for the domestic coal industry to maximise the commodity's contribution to the South African energy mix.

The roadmap adopts a scenario-based approach to determine the implications of following a certain coal "trajectory". It also identifies actions that are considered "overdue" to ensure energy security in the face of what coal commentators refer to as the projected Eskom coal "cliff" from 2015 – a 60-million-ton deficit in the required coal volumes for the country's developing power stations.

The roadmap contends that, to ensure that existing coal-fired power stations remain operational, additional coal contracts must be secured, while the development of new mines is fundamental.

Modelling and available data suggest that sufficient coal resources exist in the Central basin to supply existing power stations and the new Kusile power station over their expected service lives. Crucially, however, the availability of the coal does not guarantee its delivery to the power stations, which depend on several factors, including the ability to open new mines and to develop associated transport infrastructure adequately and on time.

Currently, a capacity constraint is present on the rail line that runs from Mpumalanga to the coal export terminal, in Richards Bay. However, indications are that plans are afoot to resolve this constraint. In parallel with the rail development aimed at unlocking the potential of the Waterberg, Transnet is developing a link to divert general freight off the Ermelo–Richards Bay line through Swaziland, which will increase the capacity of the line from Mpumalanga to the export terminal. Plans are also being considered to further expand the Richards Bay Coal Terminal and Transnet is considering the development of a new coal terminal, also in Richards Bay.

The SACRM advises that infrastructure and new mine development will need to be accompanied by a legislative and policy environment conducive to mining investment and accompanied by an agreement on a fair pricing model.

Mining companies currently face several challenges, including government's failures to adhere to mandatory approval processes, discretionary decision making and a lack of certainty when attempting to obtain the necessary approvals for the establishment of new mines.

The roadmap states that "in addition, the current lack of security of tenure on prospecting rights introduces uncertainty, while also enabling the 'hoarding' of prospecting rights".

Meanwhile, despite the expected coal supply deficit from 2015, the roadmap emphasises the need to continue to capitalise on coal exports – a critical source of foreign revenue.

To ensure an appropriate balance between supply to the domestic and export markets, meaningful engagement is required between Eskom and the country's major coal producers to find a lasting solution. In the absence of this, regulatory measures may be implemented to ensure an appropriate balance between export and domestic coal needs. Heavy-handed regulatory mechanisms, however, could have major implications for future coal investments in the country.

Coal stockpile

Source: Bloomberg

Key participants

Major companies

A handful of large mining companies – Anglo American, Exxaro Resources, Sasol Mining, BHP Billiton Energy Coal South Africa (Becsa) and Glencore Xstrata – dominate South Africa's coal production, while the remaining small portion of the country's total coal output is supplied by a large number of smaller companies.

South Africa's top five coal producers	
Company	**Output**
Anglo American Thermal Coal	57.13-million tonnes (attributable production) (year ended December 31, 2012)
Exxaro Resources	40.05-million tonnes (production, including char) (year ended December 31, 2012)
Sasol Mining	40-million tons (production) (year ended June 30, 2012)
BHP Billiton Energy Coal South Africa	33.28-million tonnes (production) (year ended June 30, 2012)
Glencore	27.1-million tonnes (own production) (year ended December 31, 2012)
Xstrata Coal South Africa	18.7-million tonnes (production) (year ended December 31, 2012)

Source: Compiled from the annual results of the various companies

Global diversified miner **Anglo American** is South Africa's largest energy coal producer. The company's global thermal coal business unit produced 68.68-million tonnes of attributable coal in 2012 from operations in South Africa and Colombia. The company's South African thermal coal operations were the source of 57.13-million tonnes, or 83%, of this production. Of this, 30% was export thermal coal, 59% was coal suitable for sale to electricity utility Eskom and 11% was suitable for other domestic purposes.

Anglo American's coal production in South Africa takes place at ten mining operations. Seven of these – the Goedehoop, Greenside, Isibonelo, Kleinkopje, Landau and New Denmark mines, in Mpumalanga, and the New Vaal colliery, in the Free State – are wholly owned by the company. Two of these – the Kriel mine and the new Zibulo colliery, both in Mpumalanga – are 73% owned by the company, through Anglo American Inyosi Coal, a black economic-empowerment (BEE) venture. The Mafube mine is a 50:50 joint venture (JV) with Exxaro Resources. The Phola coal washing plant is a 50:50 JV between Anglo American Inyosi Coal and Becsa.

Six of the mines collectively supply thermal coal to the export and local markets; the New Vaal, New Denmark and Kriel collieries are domestic product operations supplying coal to Eskom; and the Isibonelo mine produces coal for synthetic fuels producer Sasol under a 20-year supply contract.

All export thermal coal produced in South Africa by Anglo American is routed through the Richards Bay Coal Terminal (RBCT), in which the company has a substantial shareholding, to customers in the Mediterranean-Atlantic and Asia-Pacific regions. Anglo American's export production of thermal coal in 2012 was 5% up on the previous year, owing to the continued ramp-up at Zibulo and a change to include lower calorific value coals. This was partly offset by the planned closure of high-cost sections at Goedehoop, Greenside and pits at Kleinkopje. Export production volumes are expected to continue to increase in future, as a result of yield improvements and the increased production of coal with a lower calorific value.

Greenside colliery: Anglo American Thermal Coal's most productive mine

Anglo American Thermal Coal's Greenside colliery has been the company's most productive mine for the past six years.

Three of the Mpumalanga-based colliery's sections are ranked in the top five highest-producing underground continuous miner sections in South Africa. The George section of the colliery reached the million-tonne mark in December 2012 without recording a single safety incident. This achievement was closely matched by the Thandeka and Vumagara sections, neither of which recorded a safety incident.

The Greenside colliery is also at the forefront of technological developments on the continent, with the Vumagara section boasting the first flexible conveyor train, a system that continuously hauls and eliminates bottlenecking, which is common among underground continuous miners and shuttle car operations. This ultimately allows modern, high-production continuous miners to operate at maximum capacity.

In September 2012, the Greenside colliery yielded 116 708 t – the highest monthly yield of any colliery outside the US.

In addition to its existing coal mining operations in South Africa, Anglo American has several projects in the pipeline, including the Elders multiproduct underground and the New Largo projects, in Mpumalanga.

Anglo American's thermal coal business unit generated an underlying operating profit of $793-million in 2012, including $482-million from its South African operations. The South African underlying profit was 38% down on the previous year, owing to lower than average export thermal coal prices and above-inflation cost increases for labour, power and fuel. This was partly offset by the incorporation of Zibulo as an operating asset, a weaker South African rand and higher sales volumes, supported by more stable rail performance by Transnet Freight Rail.

Exxaro Resources, one of South Africa's largest BEE companies, is another diversified mining company with coal operations in South Africa. The company produced 40.05-million tonnes of coal in 2012, making it South Africa's second-largest coal producer.

Exxaro's production of power station, steam and coking coal comes from eight wholly owned coal mines – Grootegeluk and Tshikondeni, in Limpopo, and Leeuwpan, Inyanda, Arnot, Matla, New Clydesdale and the North Block Complex, in Mpumalanga – and from its Mafube JV with Anglo American, in Mpumalanga. The company also produces char and related products for the ferroalloys industry.

The bulk of Exxaro's coal production by volume – 80% in 2012 – is sold to Eskom, with the company being one of the power utility's largest coal suppliers. The company also supplies other local customers, such as steelmaker ArcelorMittal South Africa, which acquires coking coal from Exxaro's Tshikondeni mine. In addition, Exxaro sells significant quantities of coal on the export market, exporting through the RBCT, where it has an export entitlement.

In March 2013, Exxaro experienced labour-related challenges, with strikes at all but two of its operations. The strikes occurred because of nonpayment of performance bonuses and other grievances. The company reported that it had contingency measures in place to ensure the availability of coal to Eskom power stations supplied by the affected mines.

Exxaro has a pipeline of projects, with a particular focus on the Waterberg region, in Limpopo, which is considered to represent the future of South African coal mining. Key among the projects under development is a major expansion at the company's Grootegeluk mine. In addition, it is pursuing the Thabametsi greenfield development, in the Waterberg, and other opportunities.

Sasol Mining, which is a wholly owned subsidiary of petrochemicals company Sasol, produced 40-million tons of saleable coal in the financial year ended June 30, 2012. This was largely in line with production in the previous financial year, despite industrial action and adverse geological conditions.

Sasol Mining's production is largely used as gasification feedstock and utilities coal at the company's Synfuels and Infrachem plants. The company also undertakes exports through the RBCT, at a rate of about 2.8-million tons a year.

Sasol Mining's six operations are all wholly owned. They include the Sigma mine, in the Free State, and the Bosjesspruit, Brandspruit, Middelbult, Syferfontein and Twistdraai mines, all in Mpumalanga. The company is also undertaking several projects to replace output at mines that are nearing the end of their productive lives. The first of these projects – the R3.4-billion Thubelisha shaft – was inaugurated at the Twistdraai colliery in May 2012. Other replacement projects include the Impumelelo mine, which will replace the Brandspruit operation, and the Middelbult mine that will be extended underground. These projects are under development.

Sasol Mining recorded an operating profit of R2.29-billion in the financial year ended June 30, 2012. This was supported by higher US dollar coal export prices and sales prices to Sasol Synfuels, along with the weaker rand/US dollar exchange rate.

BHP Billiton has coal operations in South Africa, Australia, the US and Colombia. The company's South African operations are incorporated in BHP Billiton Energy Coal South Africa (Becsa), which is 90% owned by BHP Billiton.

Becsa produced 31.63-million tonnes of coal in the financial year ended June 30, 2013, accounting for 43% of BHP Bililton's total energy coal production of 72.89-million tonnes for the year. Typically, a significant portion of Becsa's production is sold to Eskom, with the balance being exported through the RBCT, in which Becsa owns a 22% share.

Becsa's operations include four mines – Khutala, Klipspruit, Middelburg and Wolvekrans – situated near the towns of eMalahleni and Middelburg, in Mpumalanga, and three processing plants, including the Phola processing plant, which is a JV with Anglo American Inyosi Coal. The reserve lives of these mines range from eight years at Khutala to 29 years at Middelburg.

In late 2012, Becsa indicated that, owing to rail-related constraints, it had not been able to access its full rail allocation to the RBCT. As a result, the company was facing the prospect of having to cut back mining production, as its mine stockpiles were approaching full capacity. Nevertheless, Becsa's operations had been planned to ensure the use of its full rail allocation for the year and the company stressed that it had no intention of curtailing export coal volumes.

The other significant coal producer active in South Africa is newly merged diversified mining major **Glencore Xstrata**. Glencore and Xstrata were separately involved in South Africa's coal industry prior to the merger, which was concluded in early 2013.

In 2012, Xstrata produced 18.7-million tonnes of coal in South Africa, from its Tweefontein and Impunzi complexes and the Goedgevonden mine, all in Mpumalanga. Production was up on the previous year's output, owing to the continued ramp-up at Goedgevonden, a full year of output from the Atcom East mine, which is part of the Impunzi complex, and continued productivity improvements at the Impunzi and Tweefontein opencut mines. Of the company's total South African production in 2012, 12.3-million tonnes were export coal. This was up from 10.5-million tonnes in 2011.

Glencore's portfolio of South African coal operations in 2012 included interests in Shanduka Coal, Umcebo Mining and Optimum Coal. Production for the year, at 27.1-million tonnes, was 104% up on the previous year, owing to the acquisitions of Optimum and Umcebo.

In the first quarter of 2013, the combined South African coal production of Glencore Xstrata was 10.7-million tonnes.

South African electricity utility Eskom applied to the Competition Tribunal to intervene in the merger between Glencore and Xstrata, owing to concerns regarding the impact that the merger could have on the utility's ability to meet its coal requirements. Eskom subsequently withdrew its application in favour of a negotiated settlement.

Smaller companies

As of 2012, there were 34 junior coal miners in collectively comprising about 7% of the local coal market. While this position is small, it is believed that the number of junior coal companies and their production rate are increasing.

Some junior mining companies have been involved in the South African coal market for many years, but the majority are relatively new to the market. Many of the new entrants have their origins outside South Africa and have listings in locations such as Sydney, Toronto and London, while others are listed on the JSE or have dual listings. There are also those that have uniquely South African origins, including as a result of BEE opportunities and ventures.

The presence of a large number of smaller companies in South Africa's coal mining industry has had the benefit of broadening the spread of wealth derived from this sector. However, many of the smaller participants in the coal mining industry have reported operational challenges.

Key among these challenges are difficulties in accessing the infrastructure required to get their product to the market. Smaller companies have struggled to conclude contracts with State-owned rail operator Transnet Freight Rail (TFR). Smaller companies also experience notable difficulties in accessing the port infrastructure required to export their output, as the privately owned RBCT has limited capacity, much of which is dedicated to the terminal's shareholders.

Smaller companies lack the clout to prompt government to tackle the logistical constraints facing the sector. They also lack the financial means needed to build their own infrastructure. As a result, they have been forced to consider other transport options. Some companies that have struggled to access rail capacity have resorted to the use of road transport, while companies that have experienced difficulties in accessing capacity at the RBCT have started using other export terminals, including terminals outside South Africa. However, these alternative transport options are frequently more expensive than use of TFR and the RBCT.

A further challenge facing junior coal miners in South Africa is that they do not have access to the types of in-house expertise available to larger companies and depend on external expertise, including that of geology. Junior companies also face the difficulty of accessing quality reserves, with most of the quality reserves having been mined by larger coal miners, resulting in junior miners mining on fringe reserves. In such circumstances, it is especially important for these companies to understand the fundamentals of the geology of the area they are pursuing.

Some of the smaller participants active in the South African coal mining industry are Coal of Africa Limited (CoAL), Continental Coal, Forbes & Manhattan Coal, Keaton Energy, South African Coal Mining Holdings and Wescoal.

ASX-, Aim-, and JSE-listed **Coal of Africa Limited** (CoAL) produced 4.93-million run-of-mine (RoM) tonnes of coal in the financial year ended June 30, 2012, and recorded coal sales of 3.37-million tonnes for the year. The company has three collieries in South Africa. The Vele colliery, in Limpopo, entered production in January 2012 and is currently in the build-up phase, with the intention to produce two-million tonnes a year by 2016. A further ramp-up, to five-million tonnes a year will be subject to prevailing market conditions. The Vele mine has faced substantial opposition, owing to its location in a geographically sensitive area, adjacent to the Mapungubwe World Heritage Site.


Vele secondary wash plant A and B

Source: CoAL

The Woestalleen complex, in Mpumalanga, includes the Vuna mine, which was scheduled for closure in April 2013, and three coal-beneficiation plants, which will continue to be operational for several years. The Mooiplaats colliery, in Mpumalanga, is being placed on care and maintenance following sustained, but unsuccessful, efforts over the past two financial years to make the operation profitable. The mine experienced a six-week wage-related strike in 2012. CoAL is attempting to dispose of its noncore thermal coal mines in Mpumalanga.

Further, the company is developing the Makhado project, in Limpopo, for which a definitive feasibility study was recently completed, confirming the project's ability to produce 2.3-million tonnes a year of world-class quality hard coking coal and 3.2-million tonnes of thermal coal. CoAL also has exploration interests grouped together as the Greater Soutpansberg project.

In addition to its mining operations, CoAL has a three-million-tonne export allocation at the Matola terminal, in Mozambique.

Continental Coal is a coal production, development and exploration company listed on the ASX and the Aim, and soon to be listed on the JSE. The company produced 1.93-million tonnes of RoM thermal coal in the financial year ended June 30, 2012. Total export-quality coal processed in the period was one-million tonnes and total thermal coal sales amounted to 1.86-million tonnes for the year.

The company has three operating mines in South Africa – Vlakvarkfontein, Ferreira and Penumbra, all situated in Mpumalanga. Vlakvarkfontein was Continental's first coal operation and was developed as a greenfield project. First production at the mine was achieved within 12 months of its acquisition and the operation has fully repaid all its capital development costs. It is forecast to continue to generate free cashflow and dividends to its shareholders over the next seven years. In September 2012, the Department of Mineral Resources (DMR) approved Continental's application to extend the current opencast mining operations at Ferreira into adjacent prospecting rights. Mining of an additional 650 000 t to 750 000 t RoM production was forecast from the new prospecting rights over a period of 15 to 18 months. Construction on the Penumbra mine started in September 2011 and the operation entered production in late 2012. Full production was expected to be achieved in June 2013. At full production, the mine will produce 750 000 t/y, 500 000 t/y of which will be export-quality coal. The estimated capital development cost of Penumbra was $40-million and the expected life-of-mine (LoM) of the operation is ten years, although there are opportunities for a LoM extension.

In addition to its existing operating mines, Continental is developing a fourth operation, the De Wittekrans project, also in Mpumalanga, which is expected to have a LoM of 33 years and yearly RoM production of 3.6-million tonnes.

Forbes & Manhattan Coal is an emerging thermal and metallurgical coal miner listed on the JSE and the TSX. The company owns and operates two mines, Magdalena and Aviemore, in northern KwaZulu-Natal, as well as two processing plants. Together these operations produced 1.41-million RoM tonnes and 958 054 t of saleable production in the financial year ended February 2013. The company is targeting the production of 1.15-million saleable tonnes in the 2014 financial year. The increased production being pursued will use existing infrastructure and capacity.

Keaton Energy is a JSE-listed company with two operating mines – Vanggatfontein, in Mpumalanga, and Vaalkrantz, in KwaZulu-Natal. In the financial year ended March 31, 2013, Vanggatfontein delivered 1.5-million tonnes of thermal coal to Eskom and sold 65 700 t of metallurgical coal. Also during the year, Vaalkrantz dispatched 326 600 t of anthracite to domestic and international metallurgical markets. Keaton is aiming to grow its production to five-million tonnes a year in the medium term. Towards this, the company has three projects in its pipeline – Sterkfontein, in Gauteng; and Koudelager and Braakfontein, in KwaZulu-Natal. The company is also considering acquisitions to supplement its production growth profile.

South African Coal Mining Holdings is a junior coal producer active in the Ermelo district of Mpumalanga. The company produced 401 366 t of RoM coal in 2012 and bought a further 86 604 t of RoM coal from third parties to supplement its own production. Operations at the company's Vlakfontein opencast area and the Mooifontein underground area came to an end in 2012 and delays in securing approval of a water-use licence application resulted in the suspension of plans to start mining the Voorslag underground area. The company's majority shareholder, Indian-listed JSW Energy, has committed to continuing to support the group during the period in which its operations remain suspended.

Wescoal is a coal junior active in the mining, processing, procurement and trading of coal. The company has two operating mines in Mpumalanga – Khanyisa, which has gone underground, and Intibane, which was commissioned in April 2013. Together, these operations are expected to take the company's production to 1.6-million tons a year. Production in the year ended March 31, 2013 was 1.31-million tons. A deal with Xstrata, which involves the transfer of the Vlaklaagte and Elandspruit mining assets to Wescoal, will increase production to 2.4-million tons a year by the end of 2014, and Wescoal is targeting production of four-million tons a year by 2016. The company is hoping to benefit from Eskom's expected increasing coal demand.

In September 2012, it clinched a three-year R700-million deal to supply the power utility with 3.2-million tons of coal from Khanyisa and Intibane. Simultaneously with pursuing further Eskom

Wescoal's Khanyisa mine

Source: Duane Daws

opportunities, Wescoal is seeking to increase its exports through Richards Bay, where it has a 200 000 t/y Quattro allocation – Quattro allocations are for emerging BEE exporters, typically with export volumes below 250 000 t/y. The company also remains alert to acquisitions.

Corporate activity

The coal mining industry is a key contributor to merger and acquisition activity in South Africa, with the industry witnessing a significant number of partnership, disposal and equity transactions, at corporate and operational levels, in recent years.

Much of this activity has taken place under the banner of BEE, with the country's coal mining industry having experienced a higher level of transformation than many of the country's other mining sectors. In part, this is a result of much of South Africa's coal being located in shallow deposits and, thus, amenable to opencast mining. Opencast methods are less technically challenging and more affordable than underground methods. Much of the opencast mining in South Africa's coal industry is undertaken by contract-mining companies, resulting in aspiring BEE mining companies facing fewer technical and financial barriers when entering the industry than those present in many other mining sectors.

Further, the potential exists for additional BEE activity in the coal mining industry, as significant opportunities exist for BEE operators in this sector, owing to government's intention to ensure that, by 2018, Eskom procures more than 50% of its coal from emerging black coal producers. In December 2012, it was reported that there were 33 BEE coal mines in South Africa using the DMR's BEE definition of 26% black ownership. If measured using the 50%-plus-one-share definition, the number is negligible. In addition to BEE-related transactions in South Africa's coal mining industry, companies in the sector are engaged in a variety of general corporate activity.

BEE activity among the coal majors

Much of the black economic empowerment (BEE) that has been witnessed in the coal industry has been a result of transactions involving major coal mining companies, with each of the major participants in the sector having demonstrated a commitment to transformation.

In recent months, coal major BHP Billiton Energy Coal South Africa (Becsa) – which was instrumental in the formation of BEE companies such as Eyesizwe (currently Exxaro) and Optimum (now part of Glencore Xstrata) – entered into a new empowerment transaction with a black-owned consortium, which will effectively hold an 8% equity interest in Becsa once the transaction is complete.

Becsa's shareholders have also approved the implementation of an employee share ownership plan, in which participating employees will hold a beneficial interest of 2% equity in the company for a vested period. The transactions are expected to be completed in the 2013 financial year.

Another coal major, Sasol Mining has increased its BEE ownership to more than 40%, putting it significantly ahead of the 26% ownership target for 2014 set by the Mining Charter. It has also reported that it is advancing its efforts to bring Ixia Coal, formed by the company in 2010, to the point of owning and operating a coal mine.

CoAL's financial structure has recently been bolstered by Beijing Haohua Energy, of China, subsidiary Haohua Energy International (HEI). In March 2013, the parties signed a cooperation agreement for the development of a strategic relationship. The agreement serves to facilitate the formation of a long-term mutually beneficial strategic partnership between CoAL and HEI. The agreement followed shareholder approval of a $100-million investment by the Hong Kong-based firm into the junior coal producer earlier in the year, which formed the basis for the partnership. Further, HEI has agreed to "use its best endeavours" to arrange further funding in the development of CoAL's project pipeline. The partnership will also enable CoAL to draw on the commercial, technical, financial and operational expertise within HEI.

Meanwhile, CoAL is attempting to dispose of its noncore thermal coal mines in Mpumalanga, which it considers as diverting attention away from its higher-value coking coal projects. Losses at Mooiplaats and Woestalleen have been a growing strain on the company which, in March 2013, reported that it was in negotiation with interested parties for either the outright sale of both operations or the establishment of partnerships that were able to add synergistic value.

In other corporate activity, CoAL reported in January 2013 that it had signed a memorandum of understanding (MoU) with energy trader Vitol Group, appointing Vitol as the company's exclusive marketing agent for its export thermal and coking coal for eight years. The MoU excludes coal from CoAL's Makhado project, where the marketing period is five years from production, and all coal subject to current agreements or potential coal offtake contracts between CoAL and its strategic equity partners.

Continental Coal has announced its intention to list on the main board of the JSE before the end of 2013. The company has described the move as a strategic initiative to enhance its growth prospects, facilitate investment by Africa-domiciled investors and augment stakeholder relations in South Africa, as it accelerates its growth profile. The company contends that sophisticated African institutional investors are strong supporters of Africa-focused resources companies, particularly those in production and, in most instances, are more comfortable trading on the JSE than other exchanges. Investec Bank has been appointed as sponsor and financial adviser for the proposed listing.

Meanwhile, in April 2013, Continental Coal's 74%-owned South African subsidiary completed the acquisition of the outstanding minority interests in coal mining junior Mashala Resources. The acquisition gives Continental Coal, besides others, 100% interests in the Ferreira and Penumbra coal mines, in Mpumalanga. Continental Coal currently also holds a 100% interest in the De Wittekrans coal project, in Mpumalanga.

This acquisition was enabled by the completion, in March 2013, of the $10-million sale of Continental's shareholding in the Vanadium and Magnetite Exploration and Development Company to a Chinese buyer, with the funds from this sale being used to buy the minority interests in Mashala Resources.

In May 2013, Continental confirmed the completion and financial settlement of a strategic financing transaction with diversified mining group Village Main Reef, which resulted in Village acquiring a 16.34% stake in Continental. As a result of the transaction, Continental's balance sheet was significantly enhanced and its capital structure streamlined. Monies raised from the placement were applied to debt reduction, working capital requirements and overall strengthening of the company's balance sheet.

JSE- and ASX-listed **Firestone Energy** has been the subject of a hostile takeover by the ASX-listed Waterberg Coal Company (previously Range River Coal) since December 2012. Firestone has been fighting the takeover, calling the proposed deal "inadequate and opportunistic". Further, Firestone contends that the deal, even in its revised form, does not offer compensation for the strategic and inherent value of its assets and will dilute the company's shareholding and effective ownership in these assets. In addition, Firestone believes that the JSE provides better access to capital markets, more corporate credibility and better liquidity for shareholders than a single listing on the ASX.

In February 2013, **Forbes & Manhattan Coal** cancelled an acquisition agreement with Riversdale Mining after the takeover target's Zululand Anthracite Colliery, in

KwaZulu-Natal, underperformed. Forbes indicated that the colliery's performance had "deteriorated to a material extent" since September 2012 when it entered into the acquisition agreement. Forbes argued that this decline was a breach of certain provisions within the agreement. Riversdale denied being in breach of the agreement and stated that Forbes' retraction constituted a repudiation of the agreement. The parties are attempting to reach agreement on a mutually beneficial way forward. At the time of the signing of the acquisition agreement, concerned shareholders questioned the process by which the board had committed the company to the R440-million transaction, which also included the acquisition of the undeveloped Riversdale anthracite colliery, also in KwaZulu-Natal.

Keaton Energy is considering acquisition opportunities to supplement its production growth profile as it pursues the medium-term goal of producing five-million tonnes a year of coal. In the financial year ended March 31, 2013, the company identified 16 potential acquisition targets, of which ten were examined in detail. Five of these failed to clear financial and/or technical hurdles. One acquisition, the Mooiklip anthracite project, was completed.

Mining services provider and coal miner **Sentula Mining** announced in June 2013 that it had entered talks with a consortium comprising Miranda, Mochiba Investments and Jay and Jayendra for the disposal of its 60% stake in the Mpumalanga-based Nkomati anthracite mine. The Mpumalanga Economic Growth Agency owns the remaining 40% shareholding in the mine, which has 7.2-million tonnes of proven reserves and 4.4-million tonnes of indicated resources, with an 80-year LoM. The mine, which was acquired in 2008 and placed on care and maintenance in 2011, is being brought back into production after receipt of an integrated water-use licence and the approval for an amended environmental management programme in November 2012. The openpit has since been dewatered and the group is in the final stages of infrastructure refurbishment.

Sentula also has stakes in four other coal assets, two of which are in South Africa, The Schoongezicht coal prospecting right, near Delmas, in Mpumalanga, will be sold to Miniandante Proprietary for R22-million. The company expects to finalise the potential sale of its other South Africa-based coal investment, the R172-million near-development Bankfontein coal project, near Ermelo, in Mpumalanga, by August or September 2013, after identifying potential buyers. The potential mine, which will produce about 4.7-million tonnes of opencast RoM coal over about seven years, is expected to start operations in 2013.

ASX-listed **Universal Coal** announced in late 2012 that it had secured a major shareholder, with Coal Development Holding, a wholly owned investment vehicle of the African Minerals Exploration & Development Fund, taking a 29.99% stake in the company.

Wescoal is engaged in a deal with Xstrata, in terms of which Wescoal will sell its Vlaklaagte mining right to Xstrata for R81.1-million and, in turn, will buy Xstrata's Elandspruit right for R93.8-million. The transactions are expected to increase Wescoal's LoM by 15 years in the medium term. The company has indicated that Vlaklaagte is being sold as part of the company's strategy of securing and retaining only high-quality coal resources that can be mined using opencast methods.

Meanwhile, in June 2013, Wescoal reported that it was acquiring a coal trading business from an undisclosed third party for R79-million in property, moveable assets and goodwill. The acquisition, through Wescoal's wholly owned subsidiary Chandler Coal, is expected to provide the group's trading arm with sufficient critical mass to negotiate and overcome competition and volume challenges. Further, the purchase will enable Chandler to generate significant synergy savings and profits. The deal is expected to be completed by October 31, 2013, subject to conditions, including the conclusion of a legal and financial due diligence investigation, shareholder approval; the necessary regulatory approvals and Chandler being able to secure funding for the acquisition.

ASX-listed **ZYL** announced in June 2013 that it had decided not to continue with the acquisition of the Mbila anthracite project, in KwaZulu-Natal, cancelling an associated A$5.6-million capital raising. The announcement followed a decision by ZYL to review its assets to determine their appropriateness for operational mining purposes. The aim of the review was to rule out assets that are marginal, high risk or which required considerable additional exploration. Under the terms of the revised settlement agreement, ZYL has agreed to pay the Mbila vendors an estimated A$350 000 by July 3 and a further A$150 000 by September 25.

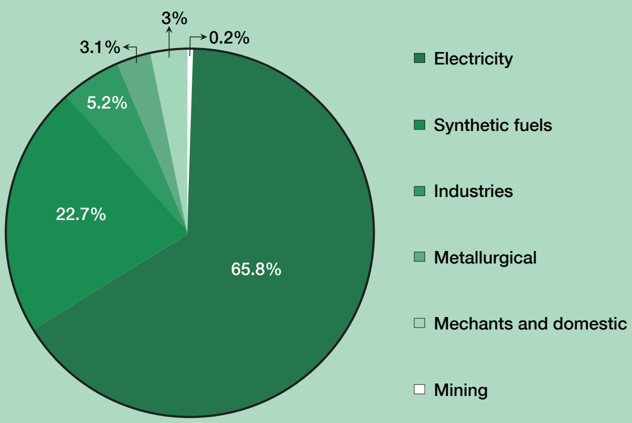
On the payment of the second tranche, the parties have agreed to release each other from further claims. ZYL shareholder Prestige Glory has agreed to provide a A$1-million convertible note, which will be drawn down in two tranches, providing ZYL with the working capital to make the Mbila payments. In July 2013, ZYL reported that it had decided to "significantly reduce" its corporate overheads in South Africa and that it had retrenched the majority of its South African employees.

Meanwhile, ZYL will continue to hold its 42.86% interest in the Kangwane Central project and a 70% interest in the Kangwane South project, in eastern Mpumalanga. The board is exploring the possibility of acquiring an additional interest in the Kangwane Central project.

Local demand

The bulk of South Africa's yearly saleable coal production is sold locally. Local coal demand is dominated by the electricity sector, which accounts for about 66% of local sales. A further 23% of local coal demand comes from the synthetic fuels (synfuels) industry. Industrial demand accounts for about 5% of local coal demand, the metallurgical industries and small coal merchants each account for about 3% and mining accounts for about 0.2%.

Local coal sales by user for 2011



Source: XMP Consulting

Electricity demand

More than 90% of the electricity used in South Africa is produced in coal-fired power stations. As a result, the key source of local demand for coal is electricity utility Eskom. The utility's existing demand for coal is in the region of 120-million tons a year and Eskom's demand for coal is set to increase in the coming years, as a result of the utility bringing two new major coal-fired power stations on stream, among other factors.

Eskom's coal requirements are currently met by 46 mines. Many of these are situated in close proximity to the power stations that they supply – many of Eskom's power stations are termed "mine-mouth" facilities, where the coal is transported the short distance from the mine to the power station by conveyor belts. Much of the coal supply to Eskom takes place under long-term contracts, many of which operate on a cost-plus basis.

Eskom's coal requirements are rising and are expected to continue to do so. One of the reasons for this increase is that the utility is having to run its power stations at capacity factors higher than those envisaged in its long-term supply contracts. Also contributing to the utility's increasing coal requirements is bringing its two new major coal-fired power stations on line.

While Eskom's coal needs are increasing the utility is facing a situation in which several large mines that supply it are nearing the end of their operating lives and some will close down in the next ten years.

Simultaneously, Eskom has expressed concern that increasing quantities of South African coal, including the lower-quality coal traditionally supplied to the utility, are being diverted to more lucrative export markets, particularly India.

Therefore, concerns exist regarding the security of future coal supplies to Eskom. The utility's coal requirements are expected to rise to 160-million tons a year and, between now and 2020, Eskom will need at least 60-million tons a year of new coal mining capacity to come on stream. Some commentators have said that considerably more

Meeting Eskom's future coal requirements

South African Coal Roadmap chairperson Ian Hall has noted that no significant coal project to supply Eskom has been approved or funded for development in more than two years.

If South African coal mining companies are to meet Eskom's expected future demand and demand from other domestic and export markets, it is critical that an environment conducive to coal mining investment is created.

New mines need to be brought on stream as a matter of urgency and, for this to happen, the policy and regulatory environment for coal mining investment needs to be clarified and streamlined. A further challenge facing the development of projects in the coal mining industry is a dearth of funding. Indeed, XMP Consulting senior coal analyst Xavier Prevost notes that many coal projects in the pipeline will remain frozen until the industry's current severe capital constraints ease.

Various initiatives are under way to resolve the supply crunch facing Eskom.

One such initiative involves the creation of a fund to support emerging coal miners. In January 2013, Eskom reported that it was at an advanced stage of establishing such a fund with the assistance of development finance institutions and private sector companies.

Eskom has also interrogated possible imports from Botswana and Mozambique, but has noted that such a strategy is constrained by transportation costs and the utility's demand for a certain quality of coal. Therefore, emphasis is also being given to beneficiating more domestic coal to ensure that it is available at the quality required by the power station fleet.

Eskom head of primary energy Kiren Maharaj has indicated that "at this point in time, one of our immediate options is the Waterberg. We intend to do full-scale testing around coal in that area".

Fellow State-owned utility Transnet, meanwhile, is working on a transport solution to unlock the Waterberg coal resources for domestic use and for export through Richards Bay.

Wescoal's Khanyisa mine

Source: Duane Daws

than 60-million tons a year of new production will be needed, estimating the coal requirement at 120-million tons of new capacity by 2020. This means that, of the four-billion tons of coal that Eskom will need over the next 40 years, two-billion tons will need to come from new sources. Eskom is estimating that mining investments of close to R100-billion will be required to ensure that the required quantities of coal are available.

XMP Consulting senior coal analyst Xavier Prevost has noted that South Africa has enough coal resources to supply all Eskom's existing power stations plus ten more. However, the investment climate for coal mining projects, including a lack of policy certainty, is such that new coal projects are currently slow to materialise.

Warnings have been sounded that Eskom is facing a coal-supply 'cliff', unless action is taken to develop new sources of supply for the utility. Predictions of when this 'cliff' will materialise range from 2015 to 2018.

In addition to Eskom's concerns regarding its ability to secure its required future coal supplies, the utility is concerned about the price it will need to pay to secure its future coal needs.

Eskom still buys the majority of its coal through cost-plus and fixed-cost contracts. However, the proportion of coal acquired through short-term contracts has increased from about 17% in 2007 to 30% in 2012, as the performance of cost-plus mines has decreased. This increasing reliance on short-term contracts has resulted in the utility paying higher prices for its primary energy input.

In addition, Eskom's price concerns relate to mining companies possibly using emerging export opportunities as leverage in negotiations with the utility.

The parastatal's current multiyear price determination – the mechanism that dictates the electricity tariff increases the utility may implement over a particular period – allows for yearly coal-related input cost increases of 10% over the five-year period from April 1, 2013, to March 31, 2018. This request was premised on the conclusion of a "compact" with coal miners to constrain coal cost increases over the period. In early 2013, Eskom handed over a draft framework agreement to its four main coal suppliers outlining the details of a possible compact to contain the future cost of coal. By mid-2013, however, the compact had not been concluded.

Meanwhile, Eskom has appealed for a domestic coal-pricing regime that is premised on an "efficient and transparent cost, with a fair return" rather than one that migrates towards export parity-price levels. Should such a migration occur, upward pressure will be placed on Eskom's costs and on South Africa's steadily increasing power tariffs.

Mineral Resources Minister Susan Shabangu has stated that government reserves the right to take corrective measures to ensure that South Africa had sufficient coal for power generation. One such measure could involve the declaration of coal as a strategic resource, to be explored, developed and exploited in a way that primarily guarantees security of domestic power supply. This could include the prescription of export quotas and restrictions and the introduction of price controls.

Shabangu contends that the declaration of coal as a strategic resource will not halt private participation and exports.

Industry participants and analysts, however, are not convinced, and have warned that declaring coal a strategic resource will further hinder investment in the sector.

The production of export-quality coal subsidises the production of the lower-grade middlings product used by Eskom. If restrictions are placed on coal exports, the production of coal suitable for use by Eskom will become constrained. However, if coal exports are maintained, Eskom will continue to receive the coal it uses for power generation. Prevost contends that the ideal situation is for coal mining companies to have multiproduct mines producing several products, such as coking coal, thermal coal and, if possible, metallurgical coal.

Other demand

South Africa's second largest consumer of domestic coal, after Eskom, is the synthetic fuels (synfuels) industry, which accounts for about 23% of local coal sales. Synfuels giant Sasol uses about 40-million tons of coal a year to produce about 160 000 bbl/d of fuel, in addition to chemicals.

The coal used in the production of synfuels is largely mined by Sasol Mining. The company's mines in Mpumalanga supply Sasol Synfuels' coal-to-liquids plant in Secunda, while its Mooikraal mine, in the Free State, supplies coal to Sasol Infrachem's facility in Sasolburg. In addition, Sasol purchases about five-million tons a year of coal from Anglo Coal's Isibonelo mine, as part of a 20-year external purchasing agreement, which will continue until 2025.

Sasol's coal demand is set to increase in coming years. The company is expanding the capacity of its synfuels plant, in Mpumalanga, which will result in the consumption of an additional 25-million tons a year of coal when the project is completed.

Coal is also used by South Africa's metallurgical industry, dominated by ArcelorMittal South Africa (AMSA), which accounts for about 3% of domestic coal demand. Much of the coking coal used by the metallurgical industry, however, is imported, with South Africa being a net importer of coking coal. AMSA, for example, imports between 1.6-million tonnes and 1.8-million tonnes a year of coking coal from Australia.

As coking coal is a product with different grades, properties and hardness, there will always be a need to import this coal for blending purposes. Nevertheless, efforts are under way to make South Africa more self sufficient with regard to coking coal and far more significant coking coal production is expected within the next five years. Coal of Africa Limited (CoAL) for example, is pursuing the development of the Makhado coking coal project, which is expected to supply a large portion of the country's coking coal requirements. AMSA is a 12% shareholder in CoAL and could be a key customer for Makhado's output. Being a shareholder, the company could seek a preferential price. It is expected to negotiate an offtake agreement with CoAL once Makhado is closer to production.

Other domestic demand sectors for coal include various industries, such as the cement and bricklaying industries, and local merchants and traders, which sell coal mostly to small businesses, households and the mining industry.

Export sales

Despite the concerns and debate regarding the future of South African coal exports, the country exported 68.3-million tons of coal through the Richards Bay Coal Terminal (RBCT) in 2012. The terminal is the passage through which most of South Africa's coal exports leave the country. Exports through the RBCT in 2012 marked an increase on the 65.5-million tons exported through the terminal in 2011 and continued an upward trend in coal exports started in 2010. Prior to 2010, coal exports through the RBCT were declining, falling steadily and significantly for several years.

Historically, Europe was the primary destination for South African coal exports; however, in recent years, China and India have emerged as notable export destinations for South African coal.

Demand from China and India is expected to remain strong going forward, underpinned by surging power generation requirements in these countries.

According to the International Energy Agency (IEA), China became a net coal importer for the first time in 2009 and, in 2011, it surpassed Japan, which had held the position of leading coal importer for decades. Chinese coal imports continued to grow in 2012. The country is considering an import ban on low-grade coal imports, which could result in an increase in Chinese demand for South African and Australian coal, with South Africa and Australia set to usurp Indonesia as the main source of coal for China.

Meanwhile, the IEA expects that India will become the world's largest seaborne coal importer by 2017 and the second-largest coal consumer, surpassing the US. India's rankings of its most preferred source of coal imports are expected to change dramatically in 2013, with South Africa poised to surpass Australia and become the second-largest coal supplier to India. Indian officials have noted that South African policies for exports remain favourable, while the outlook for coal sourced from Indonesia and Australia is looking less promising. State-controlled Coal India Limited is making notable efforts to scout for South African supplies.

Despite demand growth for South African coal in China and India, Europe remains a substantial source of demand for local coal and, when the price is right, interest in shipping to Europe can be very high.

The global coal market

In 2011, coal supplied nearly half of the incremental primary energy supply globally. Coal demand grew by 4.3% for the year, or 3.4-billion tonnes. Chinese demand grew by 233-million tonnes. The only region where coal demand declined in 2011 was the US, where demand was affected by the availability of cheap gas.

Even though coal demand growth is slowing, coal's share of the global energy mix is still rising and, by 2017, coal will come close to surpassing oil as the world's top energy source. The world will burn about 1.2-billion tonnes more coal a year by 2017, compared with 2011.

China has become the largest coal importer in the world. In 2009, China became a net coal importer for the first time. In 2011, it became the largest coal importer, surpassing Japan, which had held the position for decades. Chinese imports (including Hong Kong) reached 204-million tonnes in 2011 and they continued to grow in 2012.

Indonesia has become the largest coal exporter in the world, surpassing Australia on a tonnage basis. Floods in Queensland in 2010/11 constrained Australian exports, while Indonesian growth did not stop, surpassing the 300-million-tonne mark.

India is expected to increase its influence in coal markets. Endowed with large coal reserves, a population of more than one-billion, electricity shortages and the largest pocket of energy poverty in the world, India makes the perfect cocktail to boost coal consumption. The domestic industry's performance will allow India to be the largest seaborne coal importer by 2017 and the second-largest coal consumer, surpassing the US.

Australia will recover its throne as the biggest coal exporter. Despite some issues, such as rising labour costs and the domestic currency rate, which give Indonesia a competitive advantage, Australia will concentrate a greater share on infrastructure and mine expansion investments to become the largest exporter.

Globally, there are almost 300-million tonnes a year of terminal capacity and between 150-million tonnes and 600-million tonnes of potential mine expansion capacity. However, low prices and uncertainty about economic growth, especially regarding China, could delay or halt some projects.

Source: International Energy Agency, Medium-Term Coal Market Report, December 2012

Richards Bay Coal Terminal operating statistics (in tons)

	2007	2008	2009	2010	2011	2012
Coal delivered to the terminal	65-million	62.7-million	61-million	62.9-million	65.7-million	68.5-million
Coal exported	66.2-million	61.8-million	61.1-million	63.4-million	65.5-million	68.3-million
Stock as at end of December	1.2-million	2.3-million	2.5-million	1.7-million	3.3-million	2.7-million

Source: Compiled from figures available on www.rbct.co.za

Coal logistics

Rail logistics

The availability of rail capacity is considered to be integral to the success of South Africa's coal mining industry, as it is currently structured. It will also be critical in ensuring the success of emerging junior coal miners.

In the year ended March 2013, State-owned rail utility Transnet Freight Rail (TFR) transported 84.3-million tons of coal. This included the transportation of 15.1-million tons of coal on TFR's general freight lines, and 69.2-million tons of coal on the utility's coal export line, which runs from the coal mining areas of Mpumalanga to the country's main export terminal in Richards Bay, KwaZulu-Natal.

TFR was disappointed with this performance, which marked an increase of only 1.9% over the total coal volume transported in the previous financial year, in spite of a 22% increase in demand from Eskom and higher levels of operational efficiency. The marginal growth reflected prevailing market conditions.

Performance on the coal export line in the year to March 2013 marked a 2.2% increase on the previous year's performance, marking an ongoing departure from a previous long trend of volume declines and stagnating growth on this line. The total capacity of the coal export line is currently about 72-million tons, which falls short of the Richards Bay Coal Terminal's (RBCT's) 91-million-ton-a-year capacity, reflecting a lack of coordination and planning between Transnet and the RBCT. Further, the gap between the capacity on the rail line and the export capacity at the RBCT is exacerbated by the rail line operating below capacity, as a result of locomotive, wagon and skills shortages, among other issues. TFR turned the corner in 2010 and has recorded improved volumes on the coal export line since that time.

Further, the utility has identified opportunities for further efficiency improvements, including introducing 200-wagon trains on the coal line to run directly from the mine to the port, instead of going through Ermelo, increasing the operation's yearly capacity to above 81-million tons. TFR's projections are that 'Project Shongololo' as it has been dubbed, will reduce cycle times for locomotives from a median of 58 to 41 hours, and wagon times from 63 to 48 hours. In addition, it will relieve capacity across TFR's coal logistics system.

The service will increase weekly railed export coal capacity by 30%, from the current 1.4-million tons, to a potential capacity of 1.85-million tons. Further, the service will open slots that can be used to deal with other domestic demands such as coal for Eskom's Majuba power station. Coal stemming from the Waterberg region, in Limpopo, will also enjoy the benefits of this unlocked potential.

In addition, the debottlenecking of Ermelo will allow TFR to run longer general freight trains, which will have positive spin-offs for other minerals sectors such as chrome.

Meanwhile, Transnet is pursuing a project to increase the capacity of its coal line from 81-million tons a year to 97.50-million tons a year by 2020. This will bring capacity on the coal line to more than the RBCT's current nameplate capacity. The planned expansions to the coal export line form part of Transnet's R307.5-billion Market Demand Strategy (MDS). Expenditure on the coal export line, under the MDS, is expected to amount to R32.4-billion.

The coal-line expansion will include the purchase of new rolling stock. Sixteen Class 15E locomotives are scheduled to be delivered in 2014 and 112 new Class 19E locomotives are scheduled for delivery in 2015 and 2016 (56 in each year).

In addition, a key element of the coal-line expansion project is the development of a 146 km railway line between Lothair, in Mpumalanga, South Africa, and Sidvokodvo, in Swaziland, with an initial capacity of 15-million tonnes a year. The link will divert general freight currently being transported on the Ermelo-Richards Bay line through Swaziland, thereby increasing the capacity of South Africa's coal export channel from Mpumalanga to the RBCT. Associated projects will result in the upgrade of the 108 km Davel-Lothair line, the strengthening of the 345 km Sidvokodvo-Richards Bay line, and the upgrading of the 154 km Phuzumoya-Maputo line. The project, which needs to accommodate imports, local demand and exports, is expected to cost between R16-billion and R17-billion, with Transnet expected to contribute R12-billion and Swazi Rail about R5-billion.

The development of the Swaziland loop is simultaneously being pursued with an initiative to build heavy-haul capacity to unlock domestic and export coal resources from the Waterberg region of Limpopo, as well as resources that could be mined in neighbouring Botswana. This proposed border-straddling connection is expected to link the Waterberg with Botswana by 2020. A rail line will link the developing Mmamabula coalfields, in Botswana, to Lephalale, in the heart of the Waterberg, and will pass through Thabazimbi on its way to the coal area of Oogies, in Mpumalanga, and onwards to Richards Bay. These developments will be integrated through the Presidential Infrastructure Coordinating Commission and the relevant projects falling within the strategic infrastructure programme it oversees, which are designed to accelerate economic development and create jobs.

By 2030, TFR could be transporting 60-million tons a year of coal for Eskom, including significant quantities from the Waterberg, in addition to substantial volumes for other domestic and export purposes.

Export terminals

Most of South Africa's coal exports take place through the RBCT, situated on the north coast of KwaZulu-Natal. The terminal was officially opened in 1976, when it had the capacity to export 12-million tons a year of coal. Incremental expansions since then have significantly increased the terminal's capacity and the facility is currently the largest coal export terminal in the world. The most recent expansion at the RBCT, the so-called Phase V project, increased capacity to 91-million tons a year. This project was commissioned in May 2010. Prior to the commissioning of the Phase V capacity, the RBCT was able to export 72-million tons a year of coal.

The RBCT is a 24-hour exporting operation, managing assets worth R7-billion and employing more than 500 people.

For years, exports through the RBCT have been dominated by the major mining companies that are terminal shareholders. However, pressure has been mounting on the terminal for some time to consider a greater spread of owners. As a result, seven of the terminal's 19 current shareholders are in the junior-miner and black-empowered new-entrant categories, with more new-entrant take-up expected.

The RBCT's exports, at 68.3-million tons of coal in 2012, currently fall well below the terminal's 91-million-ton yearly capacity. The gap between actual exports and export capacity has been attributed to constraints on TFR's coal export line.

However, TFR is increasing capacity on the export line and the building of a sixth phase at the RBCT is under consideration. This would increase the terminal's capacity to 110-million tons a year. At this level, the RBCT will have taken up all the land available to it and any further capacity increases would require development at a new site. This phase of development, the cost of which will be ameliorated by the availability of some equipment, is being mooted to accommodate new junior coal exporters. A report on the possible expansion could be presented to the Transnet board in October 2013.

Meanwhile, plans are at an advanced stage to refurbish the 12-million-ton-a-year capacity of the terminal's first phase.

In addition to the coal exports that take place through the RBCT, South African coal producers export small quantities through the Richards Bay dry bulk and multipurpose terminals, as well as through Durban. Further, Transnet Port Terminals (TPT) is developing coal export capacity at the Port of East London, with the first shipment of coal from this port taking place in December 2012.

South African coal is also exported through Maputo, in Mozambique, through the Maputo cargo terminal and the Matola coal terminal. The port is attracting companies active in the South African coal industry, but is unable to secure an export allocation at the RBCT. Freight company Grindrod had a concession to operate the Matola terminal, known as Terminal de Carvão da Matola, until 2033, with an option to extend the concession for a further ten years. In January 2012, however, it announced that it would sell a 35% stake in the terminal concession to the Vitol Group for $67.7-million. Capacity at the Maputo terminal is currently six-million tons a year and a proposed Phase 4 project could add up to 20-million tons a year of capacity.

Grindrod also has a terminal at Richards Bay, known as Navitrade, which has throughput capacity of three-million tons a year of coal.

Meanwhile, Transnet is working on a project that could result in the development of a new open-access coal terminal, servicing emerging coal mining companies, at the Port of Richards Bay. The facility will be situated a few kilometres from the RBCT and is not intended to compete with the RBCT.

A conceptual study for the proposed new terminal has been completed as part of a government-backed plan to make export capacity available for emerging black coal miners. It is envisaged that the facility could be developed in stages, possibly by a private terminal operator, starting at 14-million tons a year and potentially rising to 32-million tons a year over time. The entire project has been tentatively priced at R15-billion, with half of that likely to be for the account of Transnet National Ports Authority (TNPA), which is the landlord and infrastructure provider. The balance will need to be funded by the terminal operator.

TNPA could issue a request for expression of interest during the course of 2013, in line with the competitive process stipulated for new terminals, in South Africa's ports legislation. However, TPT, which currently operates the bulk of South Africa's port terminals, is unlikely to be precluded from bidding.

Should the feasibility studies conclude that an open-access terminal is a viable solution, construction could start in 2015. The project is being undertaken as part of Transnet's MDS and the development of the project will take place alongside a general expansion of the Richards Bay port.

Selected coal mining projects

Projects under development by large participants in the market

Anglo American has two thermal coal projects in the pipeline in South Africa – New Largo and Elders.

The New Largo project is planned for development in two stages by Anglo American Inyosi Coal. Stage 1 will involve a 23 km overland conveyor, running from an existing coal processing plant to Eskom's Kusile power stations, transporting a secondary product and other third-party coal. Stage 2 of the project will involve the construction of a new opencast colliery and associated infrastructure. Feasibility studies on the New Largo project were completed in 2012, and the project is expected to be presented for board approval once all environmental permits have been obtained for both stages of the project and the coal supply and other commercial agreements have been concluded. Anglo American expects that New Largo could achieve an indicative production volume of 11-million tonnes a year. The Anglo American website indicates that New Largo could achieve full production in 2017. In mid-2012, it was reported that Eskom had agreed to a capital-sharing arrangement with Anglo American for the development of New Largo, which could cost between R16-billion and R20-billion to develop.

The Elders project, also owned by Anglo American Inyosi Coal, could produce 3.1-million tonnes a year of thermal product. The project includes combined opencast and underground elements and is expected to be a multiproduct mine, producing a lower-grade export and middlings product. As with New Largo, the Elders project is currently unapproved, although the Anglo American website indicates that it could reach full production in 2019.

In addition to the New Largo and Elders greenfield projects, Anglo American is considering a brownfield project at the Mafube mine. This project is currently unapproved.

Exxaro Resources is undertaking a major project to expand production at its Grootegeluk mine, in the Waterberg coalfield. Total expenditure for the project is expected to be R10.2-billion, which is an increase on previous estimates, owing to a combination of factors, including escalations, labour unrest, steel shortages and additional scope. The expansion will enable the mine to deliver 14.6-million tonnes a year of coal to Eskom's Medupi power station in terms of a 45-year contract. First coal was delivered to Medupi in 2012, in terms of a revised ramp-up schedule agreed with Eskom, owing to delays in the commissioning of the power station's first unit. Production is ramping up and full production is scheduled for 2016, although the project was affected by a force majeure issued by Eskom in March, owing to a seven-week construction work stoppage at Medupi. Meanwhile, Exxaro is evaluating a bankable feasibility study (BFS) to produce market coke from semisoft coking coal at Grootegeluk.

Also in the Waterberg, Exxaro is pursuing the development of the greenfield Thabametsi project. The project will entail the development of an openpit mine and beneficiation complex to supply an on-site independent power producer (IPP) and other markets. A second-phase development at Thabametsi could result in the mine providing Eskom with between 20-million tonnes and 30-million tonnes a year, depending on rail developments.

A prefeasibility study (PFS) is being undertaken on a proposed 600 MW coal-fired baseload IPP facility in the Waterberg. In July 2013, Exxaro and energy group GDF SUEZ, of France, confirmed the conclusion of a project development agreement and coal-supply term sheet for the plant. The parties have reported that the total capacity of the plant could be expanded to about 1 200 MW, depending on the availability of water and transmission capacity. The coal will be supplied from the Thabametsi project.

Meanwhile, Exxaro has developed the first phase of a char plant, which is currently operational, and a feasibility study for a second phase is under way, although

Anglo Power project deferred

In April 2013, approval for the power project that Anglo American Thermal Coal had been facilitating for an independent power producer (IPP), in Mpumalanga, was deferred.

The plan was for group company Anglo American Platinum (Amplats), as the sole offtaker of all the electricity from the proposed 450 MW Khanyisa power project, to carry the power purchase agreement on its balance sheet as a $1-billion finance lease. However, under the platinum sector's current circumstances, the level of commitment to Amplats' balance sheet was considered inappropriate.

The project was to use the large volume of discard coal from Anglo's collieries in eMalahleni, where Kleinkopje, Greenside and Landau alone had sufficient waste to generate 1 200 MW of electricity for 40 years.

Having finalised all the transaction documents with the preferred IPP, the engineering, procurement and construction process was due to start in the first quarter of 2013, reach financial close by the end of 2013 and achieve commercial operation of the first unit during 2015.

The selected third-party IPP was to build, own and operate the power plant, which was to have access to more than 137-million tonnes of discard coal on dumps in the area.

UCG study to be finalised by mid-2015

Exxaro Resources has agreed to pay ASX-listed Linc Energy a A$20-million licence fee in return for the right to deploy Linc's underground coal gasification (UCG) technologies across sub-Saharan Africa.

Formal agreements also give Linc Energy the option to secure equity positions of up to 49% in all of Exxaro's UCG projects. Linc will hold a minimum of 15% in the first project, which could combine power generation and gas-to-liquids (GTL) production.

Should it be pursued, the electricity-generating potential of the first plant will not be smaller than 200 MW. Any GTL facility will have a capacity of more than 10 000 bbl/d.

The bankable feasibility study will be completed by mid-2015, with commissioning of the first gasifier scheduled for mid-2016, subject to regulatory and commercial viability.

The companies have noted that a further fee of A$7-million will be payable to Linc Energy on the initial project passing agreed performance tests, probably in 2017. Royalties will also be payable for any synthesis gas produced and sold.

recent weak market conditions are likely to delay the development of the second phase of this project.

In Mpumalanga, a BFS is being undertaken on the Belfast project. A mining right for this project was approved in the first quarter of 2013.

Sasol Mining is pursuing a R14-billion mine replacement programme aimed at replacing 60% of its operating capacity in Secunda over the next eight years. The first of the replacement projects – the R3.4-billion Thubelisha shaft at the Twistdraai colliery – has been inaugurated and will eventually comprise an operation delivering more than eight-million tons a year of coal over 25 years. The shaft will extend the life of the Twistdraai colliery beyond 2039 and will supply coal to Sasol Synfuels and its export customers.

The Impumelelo project, which is under construction in Mpumalanga, will replace output from Sasol's existing Brandspruit mine. The project, which is valued at R4.6-billion, is expected to achieve first production in 2014, and will be ramped up to produce 8.5-million tons a year, which could later be increased to 10.5-million tons a year. This coal will be used exclusively by Sasol Synfuels.

The Shondoni project, also in Mpumalanga, will replace production from Sasol Mining's Middelbult mine. The project, which is valued at R5-billion, is expected to achieve its first production in 2015.

Sasol Mining is also progressing discussions with a prospecting licence partner at its Limpopo West reserves, towards the goal of applying for a mining licence in this coal-rich region.

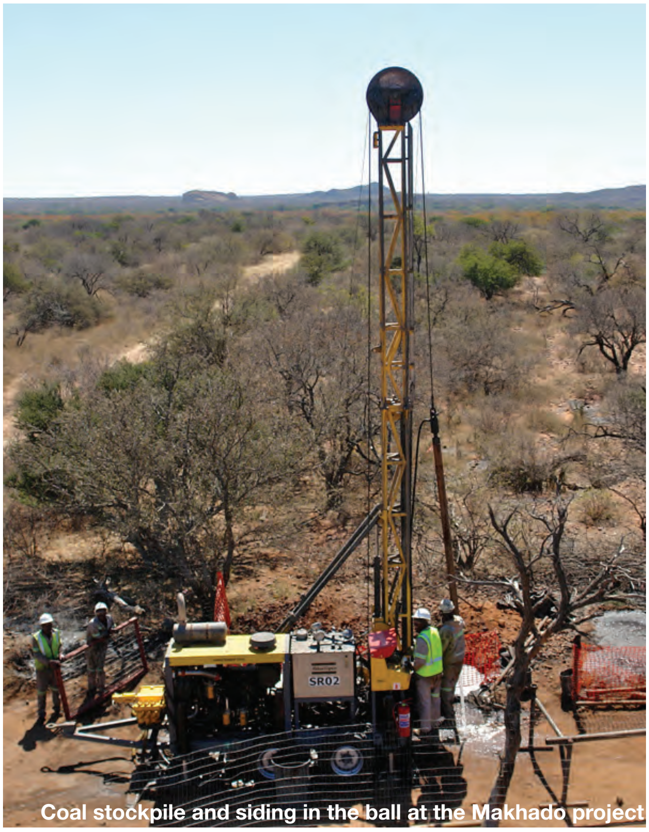
Glencore Xstrata is continuing with work on the expansion of the Tweefontein opencut mine to increase production from four-million tonnes a year to seven-million tonnes a year. The project is on track for completion in 2015. At Optimum, an underground brownfield project is being undertaken at Pullenshope and a project is also being pursued at Koornfontein.

Glencore Xstrata is also undertaking PFSs on expanding the Goedgevonden mine. Completion of these studies is expected in late 2014. Further, definitive feasibility studies (DFSs) relating to the Springboklaagte and Argent projects, at Shanduka and Umcebo, have been undertaken.

Projects under development by smaller participants in the market

Emerging miner **Coal of Africa Limited** (CoAL) is engaged in the development of the Makhado coking coal project, in Limpopo, which has been described as a potential "game-changer" for the company.

In June 2013, the company announced the results of a DFS on the project, which put a price tag of R3.96-billion, including contingency, on the mine. The mine is expected to produce 2.3-million tonnes a year of hard coking coal and 3.2-million tonnes a year of thermal coal. The peak funding requirement is estimated to be R4.2-billion. The study delivered an internal rate of return of 30.1% and a net present value of R6.79-billion at a real discount rate of 8%.



Coal stockpile and siding in the ball at the Makhado project

Source: CoAL

The group is working towards a funding structure for the project. This will include debt funding, whereby CoAL will retain majority ownership and the incoming partner's contribution will meet the equity requirement for the project. Diversified miner Exxaro previously held a right to participate in the development of the project. However, it indicated in late 2012 that it would not exercise that right.

Meanwhile, CoAL has started discussions with potential black economic-empowerment (BEE) partners, including communities and strategic partners, for the projects.

Subject to the conclusion of a BEE transaction, CoAL is expecting regulatory approvals for Makhado – a new-order mining right and an integrated water-use licence – by the first half of 2014, which will pave the way for construction to begin. The first production is scheduled to start in month 26 from the project start date.

The Makhado project represents CoAL's first step in the development of a major resource across the Soutpansberg coalfield. The company also has access to the Greater Soutpansberg project assets, including some acquired from Rio Tinto and Kwezi Mining in April 2012.

Continental Coal holds a 100% interest in the De Wittekrans coal project, in Mpumalanga, which is to be developed as the company's fourth thermal coal mining operation. In May 2013, it was reported that Continental was advancing offtake agreements, financing and strategic partnership discussions ahead of the project's initial openpit development.

Optimisation work completed on the feasibility study for De Wittekrans in the last quarter of 2012 identified the opportunity to develop De Wittekrans into a major mining operation, which would produce 3.6-million tonnes a year of run-of-mine coal over a 33-year mine life, with yearly sales of up to 2.4-million tonnes a year of a thermal coal product. Continental has indicated that this product will be ideally suited for the Asian export market and the South African domestic market, with yearly sales revenue forecast to reach up to $145-million.

Meanwhile, the Botswana Department of Mines has renewed Continental Coal's three prospecting licences for a further two years, paving the way for the company to finalise its second-phase exploration drilling programme and advance discussions with potential strategic partners. The prospecting licences comprise the Serowe and Kweneng coal projects, of which both said are to be strategically located.

Firestone Energy is involved in the development of the Waterberg coal project, in Limpopo, which is set to enter production in the second half of 2015. The construction of the mine is estimated to cost R500-million.

In May 2013, Firestone published an interim resource statement for the project. Drilling results have confirmed the gross tons *in situ* to be 1.09-billion tonnes and the combined indicated and inferred resource to be 92.31-million tonnes. The interim resource statement covers two properties of the four farms held by Sekoko Coal, with which Firestone shareholder Ariona holds a formal sale and purchase agreement.

A BFS on the Waterberg project was scheduled for completion by the end of June 2013. The delivery of the BFS is one of the key conditions required to convert an agreement between Firestone and Eskom – which outlines the supply of ten-million tonnes a year to the parastatal – from a memorandum of understanding to a coal supply agreement (CSA). The finalisation of the CSA also requires that Eskom be satisfied with the quality of the coal and that an agreement determining the price of the coal be finalised. The coal price negotiations are expected to start in the second half of 2013 and Eskom has indicated that it may embark on a bulk sample burn test to confirm the coal qualities. The results of this test may only be available in the first half of 2014.

The start of production at the Waterberg project will only take place following the completion of the CSA and the confirmed drawdown of project financing facilities.

Drilling at the Waterberg JV coal project

Source: Firestone Energy

Keaton Energy, in its effort to grow its production to five-million tonnes a year, is pursuing three projects – Braakfontein, Sterkfontein and Koudelager. In the financial year ended March 31, 2013, Keaton completed concept studies on the Braakfontein and Sterkfontein projects, resulting in an increased resource at Sterkfontein. Both projects are being advanced, with Braakfontein being the priority. Meanwhile, drilling for portal placement at the Koudelager project is being undertaken and mining is planned to begin during the course of the 2014 financial year.

ASX- and JSE-listed **Resource Generation** (Resgen) is undertaking the development of the $630-million Boikarabelo project, in Limpopo. Construction on the project started in February 2013 and, in April 2013, Resgen reported that construction activities were making good progress.

Stage 1 of the development at Boikarabelo is targeting saleable coal production of six-million tonnes a year. Of this, three-million tonnes are destined for the export market and three-million tonnes will be used domestically. First production is expected in 2015. Key achievements to date include obtaining a 30-year mining right and life-of-mine (LoM) development consent for the construction of the mine and rail link to the existing network, as well as the approval of an integrated water-use licence. In addition, a rail haulage contract with Transnet has confirmed allocation to meet export and domestic sales requirements for Stage 1 of operations, along with a port access contract sufficient for Stage 1 export requirements. Sufficient power supply has also been arranged for the Stage 1 operation.

Stage 2, planned for 2018, will involve ramping up production to 20-million tonnes of product coal.

The Boikarabelo project also includes the development of a 38 km rail link to the existing rail network. In July 2013, Resgen reported that it was preparing to start construction on the rail line. Meanwhile, Resgen's BEE partner, Ledjadja Coal, has signed a ten-year, take-or-pay rail contract with Transnet Freight Rail to haul up to six-million tonnes a year of coal. The contract could be extended for a further ten years. Conditional to the contract was the completion of the construction of the rail link to the existing rail network.

With regard to offtake agreements, in April 2013, Resgen reported that it had secured a third export coal offtake contract with the Noble Group for the supply of 2.5-million tonnes of coal over a five-year period. Resgen has also entered into an exclusive supply chain management and marketing agreement with Noble, under which Noble will manage the supply chain and marketing of Boikarabelo's domestic and export coal sales for 35 years. Additional offtake agreements to supply thermal coal to Indian customers and a global trader were locked down previously.

Aim-listed **Strategic Natural Resources** (SNR) is pursuing the development of its 74%-owned Elitheni coal project, in the Eastern Cape. The company has a new-order mining right on 92 km^2, covering the Phase 1 and 2 areas of the project, and prospecting rights covering a further three phases. First coal from the mine was expected in August 2013, with output to be delivered to the East London port, from where the company's offtake partner would collect it. First coal had been expected earlier however, the project failed to meet planned shipment dates, owing to wash plant engineering and commissioning issues, as well as ongoing optimisation and supply chain challenges. In July 2013, SNR indicated that it was engaged in discussions with potential investors, in pursuit of a new partner to help it repay its short-term bridging finance. The company was also seeking the partner to accelerate the development of Elitheni.

Universal Coal owns three thermal coal projects – Kangala, Roodekop and Brakfontein – in Mpumalanga, and two early-stage coking coal projects – Berenice-Cygnus and Donkin-Somerville – in Limpopo.

The Kangala project will be Universal's first operational mine, with the A$46.8-million project expected to enter production in February 2014. The mine will deliver 2.1-million tonnes a year of thermal coal, over an initial mine life of eight years, while an additional resource base could enable an increase in the mine life to 20 years. There is also the potential to further increase the resource base and extend the mine life through potential joint ventures on neighbouring resources. An offtake agreement has been signed with Eskom, and the company has also signed an offtake agreement with coal major Exxaro. Agreements for the balance of the product are being pursued. All funding for Kangala has been fully secured.

Situated 15 km from Kangala is Universal's proposed Brakfontein project. In mid-2013, Universal applied for mining rights for Brakfontein. The company expects that the thermal coal produced at Brakfontein will be washed at Kangala before being shipped to local and international markets. The planned LoM for this project is more than 20 years, with opencast mining to be undertaken for 22 years, and underground mining starting in year 23.

Meanwhile, Universal announced in April 2013 that it had increased its ownership of the Cygnus portion of the Berenice coking coal project to 50%. The Berenice project has a total Joint Ore Reserves Committee-compliant resource of 1.35-billion tonnes, of which 1.2-billion tonnes is in the measured and indicated category. Of the total resource, 675-million tonnes is attributable to Universal. The company consummated its earn-in agreement for the Cygnus property after completing a second phase of drilling, and providing an updated resource estimate. The company has the option to increase its stake in Berenice to 74% by achieving other set milestones. A PFS on the project will start by the end of 2013.

Labour

The South African coal industry employs an estimated 74 000 people and paid R14.1-billion in wages in 2010.

Industrial action

Over the past year, the South African mining industry has been wracked by labour unrest and debilitating strikes, exacerbated by a downward turn in commodity markets. As is true for most mining sectors affected by labour action, the key issue sparking labour disruptions in the coal mining sector has been wage demands. The sector has also been affected by strike action in other sectors. Keaton Energy, for example, expressed concern in late 2012 about the impact of a strike in the transport sector on its operations.

In early 2013, power utility Eskom was forced to rely on coal stockpiles to generate electricity at its Matimba, Arnot and Matla power stations as industrial action at Exxaro's coal mining operations dragged on for three weeks. Workers at the Arnot and Matla coal mines were involved in a dispute over unpaid bonuses, while at Grootegeluk, workers demanded the equalisation of conditions. In its last week, the strike spread to other Exxaro operations. In July 2013, a further strike was planned by the National Union of Mineworkers at the Arnot mine, with workers' demands including the equalisation of bonuses and that Exxaro address the issue of long-service awards.

Coal of Africa Limited (CoAL), meanwhile, experienced a six-week strike at its Mooiplaats mine in late 2012. Shortly after workers returned to work at the operation, CoAL initiated retrenchment procedures at Mooiplaats to reduce operational costs and improve efficiencies at the operation. The company has subsequently decided to close Mooiplaats.

Another coal company that has undertaken retrenchments is developer ZYL, which announced in July 2013 that, to "significantly reduce" its corporate overheads in South Africa, it would retrench the majority of its South African employees.

Meanwhile, wage negotiations between the Chamber of Mines (CoM) and certain coal mining companies started in July 2013. The CoM tabled its opening wage offer of 5.6% at the end of July 2013 on a seemingly positive note. Although the opening offer was below initial demands from unions and there were still issues, including housing, travel and living-out allowances to navigate, the meeting was considered to be encouraging. In good faith, coal companies had already made salary adjustments based on job grade earlier in 2013 to prevent similar unrest to what had been seen in the embattled gold sector. All parties committed to fast-tracking negotiations in the coal industry and aimed to conclude them in August 2013.

Skills shortages

The South African mining industry has a shortage of artisans and employees with advanced technical qualifications.

With regard to engineering capabilities, much is being done to tackle the skills deficit. Several universities in the country – including the University of the Witwatersrand (Wits), the University of South Africa, the University of Johannesburg and the University of Pretoria – offer courses aimed at solving the shortages of higher-level skills in the mining industry, including the coal mining industry. Wits, for example, offers coal mining subjects at the undergraduate level, as part of its Bachelor of Science degree in mining engineering, and the university's postgraduate programme allows for specialisation in several areas, including coal engineering and management. Further, there is interest among academic staff and researchers in developments taking place in the coal mining industry, such as the exploitation of the Waterberg coalfield and research into carbon capture and clean coal technologies.

However, at the level of artisans and skilled technicians, there is no clear strategy in place to address the skills shortage. Previously, there were strong skills-orientated programmes at technical colleges and technikons. However, many of these programmes have been discontinued, with the technikon programmes having been converted into university programmes, leaving a major gap in the industry. The Centre for Development and Enterprise has recommended that government reintroduce the apprenticeship system and that it should be supported by well-resourced further education and training (FET) colleges. Improving the quality of education available at FET colleges is one of the main priorities of the Department of Higher Education and Training, but it remains to be seen whether the plans can be implemented.

Meanwhile, many companies in the coal mining industry continue to invest funds in training activities for their own benefit and for the benefit of the industry generally. Sasol Mining, for example, is aiming to train 900 artisans, in addition to those trained to meet its own requirements, as a further contribution to the South African national skills pool.

Further, some companies engage with relevant sector education and training authorities to offer training that assists in equipping company trainees and potential trainees with skills for the workplace.

Health and safety

As a large portion of South Africa's coal mining operations are opencast, the sector is not plagued by the safety challenges present in many of the country's underground mines, particularly the deep-level gold mines. According to the CoM, Mpumalanga's coal mining sector has safety standards on a par with those of the US. There were 110 mining deaths in South Africa in 2012, of which 18 occurred in coal mines. Following the inception of the Occupational Health and Safety Representative Development Project in 2008 to train 40 000 health and safety representatives, the main cause of fatalities has shifted from fall-of-ground accidents to transport-related deaths.

In a bid to achieve zero harm, the Wits Centre for Sustainability in Mining and Industry will run a revised course that will equip leaders across industries with a holistic picture of how their organisations' culture and systems influence people's behaviour, and to look beyond the 'blame game' when trying to prevent accidents or failures. The one-week course will be presented in September 2013 and could be incorporated into postgraduate qualifications offered by the Wits School of Mining Engineering.

South Africa's coal industry employs an estimated 74 000 people

Source: Duane Daws

Environmental considerations

An increasing amount of attention has been placed on the impact that industrialisation has had on the environment. Issues, such as climate change, have had a significant impact on the coal mining industry, as the mining and the use of coal have serious environmental implications.

South Africa's coal deposits are relatively shallow, with thick seams, compared with other coal mining countries, making them easier and less expensive to mine. However, surface mining disturbs large areas of land giving rise to several environmental challenges, which include soil erosion, dust, noise and water pollution. South African law dictates that steps be taken in all phases of a mining operation to minimise the impact on the environment.

Several years before a coal mine opens, environmental-impact assessments are undertaken to define existing conditions and identify problems that may arise as a result of the mining activity. The findings of these studies are then reviewed by the Department of Mineral Resources (DMR), as an integral part of obtaining a mining permit that allows the company to proceed with the erection of infrastructure and eventually start operations.

Mine subsidence is an issue that arises from underground mining and occurs when the ground level lowers as a result of earth being removed from beneath the surface. A wide range of engineering techniques are currently in use to mitigate this set of circumstances, maximising the recovery of coal while protecting other land uses.

Some of the most serious environmental challenges in the coal mining industry relate to water, with any contamination of mine water having far-reaching consequences, which go beyond the area being mined and its ecosystem. One such challenge is acid mine drainage – metal-rich water that is formed through a chemical reaction that occurs between water and rocks containing sulphur-bearing minerals. This acidic run-off dissolves heavy metals that are also present in the ground, such as copper, lead and mercury, into ground- and surface water. Mining operations are said to contribute to at least 78% of the sulphur content in the water countrywide.

The growing interest in coal mining in the Waterberg has raised concerns about the potential threat to the natural environment and scarce water resources, as well as the tourism and agriculture industries of Limpopo. Although South Africa needs the electricity generation capacity offered by the Waterberg's coal, it is feared that coal-related environmental problems will arise, such as those experienced at the eMalahleni coalfields, where pollution from the coalfields has entered the river systems either directly, through discharge points, or indirectly, through seepage.

Further, the natural run-off in the Waterberg area is unable to supply the water demands of multiple mines and water will have to be piped in, either from treated sewage or from other river basins. The semi-arid environment of the Waterberg is likely to make the impact of spillage on the area greater than the impact of spillage at eMalahleni, as there is less flowing water to dilute pollutants carried in the water, which could have devastating effects for agriculture, tourism and surrounding communities.

Opencast coal mining is a temporary use of land and, therefore, requires the rehabilitation of land once mining operations have ceased. The DMR requires that a detailed rehabilitation plan be designed covering the period from the start of operations until after all mining activity has finished. Where underground mining has taken place, the surface area can be simultaneously used to cultivate forests, for cattle grazing and to grow crops – with little or no disruption to the existing land use. Companies are required to monitor the progress of rehabilitation and land may not be used until the vegetation is self-supporting. The cost of the rehabilitation of the mined land is factored into the mine's operating costs.

Appointed in mid-2013, new Council for Scientific and Industrial Research natural resources and the environment executive director, May Hermanus, stressed that she would take her appointment as an opportunity to show that environmental specialists can revitalise the economy, while regenerating mined-out areas. As coal mining in South Africa is poised to relocate, Hermanus has put forward a regeneration plan used for a mined-out coal area she visited in Germany, indicating that South Africa could pursue a range of initiatives to landscape the depleting Mpumalanga coalfields, while thoughtfully planning the upcoming Waterberg coal aspiration. The proposed rehabilitation plans include solar and wind energy at old coal mining sites and in pits, so that power grids can continue to be used, and the creation of a lake district, with the minerals extracted during the water-cleaning process, becoming the inputs for new industries.

Methane gas is generated as part of the process of coal formation and is released from the coal seam during mining operations. Methane is considered to be one of the most potent greenhouse gases, with a global warming potential 23 times that of carbon dioxide. The methane content in a coal seam generally increases with the depth and age of the seam. For this reason, underground mining produces up to 90% of all methane emissions from the coal sector. Therefore, tackling methane emissions is essential in meeting the challenge of climate change and can also act as a valuable source of energy, as it is the principal constituent of natural gas. Although coal is not the only source of methane emissions, methane from coal seams can be utilised rather than released into the atmosphere.

Underground coal gasification (UCG) is recognised worldwide as a viable and economic method of accessing deep, otherwise unrecoverable coal reserves, on- and offshore.

UCG, a process of converting coal into gas while it is still underground, has been under investigation by Eskom at Majuba power station for the past six years. African Carbon Energy (Africary) is taking steps to implement UCG at a proposed UCG-to-electricity project at Theunissen, in the Free State. UCG eliminates coal mining, coal transportation and the need for ash disposal and offers an opportunity for gas to be derived from coal in an environmental-friendly manner.

Africary has bought 1.4-billion tonnes of coal near Theunissen from BHP Billiton, and has signed a memorandum of understanding with a still-to-be-named independent power producer (IPP), to build, own and operate a 50 MW combined-cycle gas turbine power plant and buy the UCG-produced synthesis gas as a fuel gas. The company is aligning itself to take advantage of Eskom's next request for proposals from IPPs for baseload power supply, and expects a bankable feasibility study to be in place by the end of 2013 for what could be a R1-billion project.

Meanwhile, certain companies have identified opportunities in Africa to use binderless coal briquetting technology. The technology allows coal mines to upgrade discarded thermal coal fines into compacted, transportable and useable briquettes of significantly higher value, presenting a significant economic and environmental opportunity for the South African coal mining industry. It is estimated that South Africa generates about 60-million tons of coal fines each year from its mining operations.

Coal briquetting project

Name and Location
Coal briquetting project, KwaZulu-Natal, South Africa.

Client
Octavovox, in which Mine Restoration Investments (MRI) holds a 51% interest through its subsidiary, Western Utilities Corporation.

Project Description
Surface and underground mining operations, in South Africa, produce an estimated 300-million tons a year of coal, creating significant residues such as dust and fines. These can typically represent up to 20% of the total run-of-mine feed.

MRI is building a plant that will produce about 5 000 t/m of briquettes through the processing of coal fines from the Vaalkrantz colliery's existing fines stockpiles and monthly fines production.

Value
Octavovox has secured R11-million to complete the project.

Duration
First briquette production is planned for August, while continuous on-specification briquette production is targeted for September.

Latest Developments
None stated.

Key Contracts and Suppliers
None stated.

On Budget and on Time?
Not stated.

Contact Details for Project Information
MRI, tel +27 12 345 4037, fax +27 12 345 4808 or email mvdberg@wucsa.com.


Vaalkrantz colliery
Source: Duane Daws

Outlook

While South Africa's current levels of coal production are relatively static, it is anticipated that the coming years will result in an increase in demand for South African coal.

Local demand is forecast to grow significantly, largely driven by power utility Eskom and, of the four-billion tons of coal that Eskom is expected to need over the next 40 years, two-billion tons will need to come from new sources. Eskom is estimating that mining investments of close to R100-billion will be required to ensure that the required quantities of coal are available. Simultaneously, local demand for coal is expected to grow as a result of an expected expansion in synthetic fuels production.

In addition to the anticipated growth in local demand, demand for South African coal in the export market could also continue to grow, with demand from China and India expected to remain strong going forward. Europe is also expected to remain a substantial source of demand for South African coal.

Critical to enabling coal mining companies in South Africa to meet the anticipated demand growth for their products is the development of appropriate infrastructure to facilitate project development and coal logistics.

A key logistical input necessary for growth relates to rail infrastructure. There is currently a gap between rail and port capacity in the coal mining industry, with rail capacity falling short of export capacity at the country's ports. Rail utility Transnet, however, is pursuing a major investment project aimed at boosting the country's capacity to transport coal by rail.

In addition, projects are being considered to enhance the capacity of the country's ports to enable coal exports. The privately owned Richards Bay Coal Terminal is considering a sixth expansion phase and Transnet is considering projects at other ports to enable additional coal exports. A project is also under consideration at the Maputo port, in Mozambique.

While logistical projects are being pursued to enable higher levels of coal production, several mining projects are also in the pipeline. Many of these are located in the Waterberg, which is expected to become South Africa's new hub of coal mining activity. The Waterberg, which is currently home to only one operating mine, is believed to represent South Africa's single biggest opportunity for coal mining growth.

However, the development of new coal projects depends on an appropriate investment climate and it has been noted that no significant coal project to supply Eskom has been approved or funded for development in more than two years. Warnings have been sounded that, should action not be taken shortly to develop new sources of coal supply for the utility, Eskom could face a coal-supply 'cliff'.

Meanwhile, Eskom faces other concerns, including the price it will have to pay to secure its future coal supplies. These concerns have led the Department of Mineral Resources to propose that coal be declared a strategic mineral, thereby avoiding a situation that will result in Eskom having to pay export-parity prices for its coal. Industry experts, however, point out that intefering in the market in this way might have the effect of sterilising coal resources, as the incentive to mine coal for more lucrative export purposes will be weakened.

Local demand for coal is expected to increase in the next few years, driven largely by Eskom

Source: RBCT

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