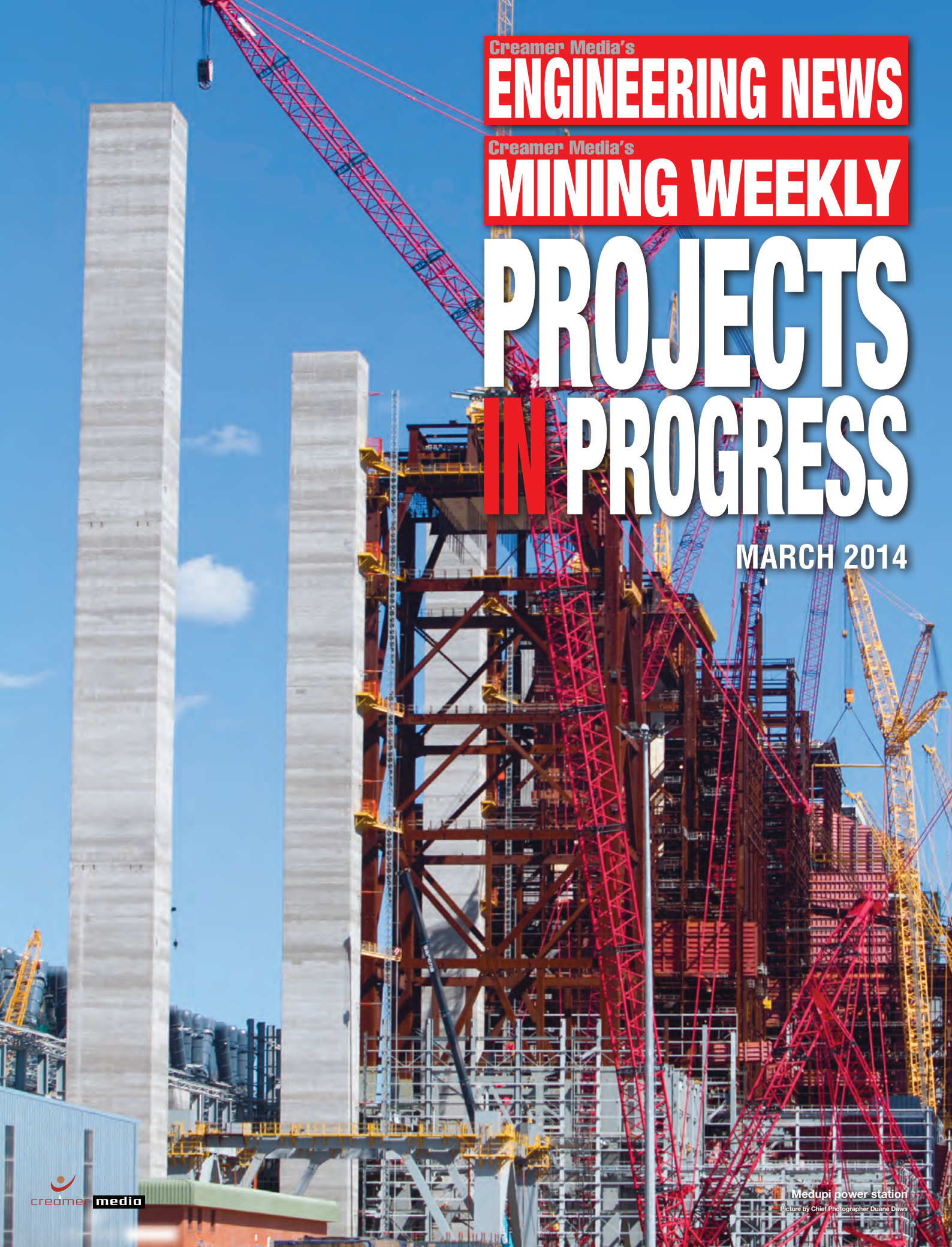




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ENGINEERING NEWS

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MINING WEEKLY

PROJECTS **IN** PROGRESS

MARCH 2014

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Ticking over, but no fireworks

The growth outlook for South Africa remains weak, with even the National Treasury's modest gross domestic product forecast of 2.7% for 2014 considered as optimistic by some observers.

This official growth estimate is also well below the 5.4% yearly growth aspiration outlined in the National Development Plan, which argues that higher levels of sustained economic expansion are required if South Africa is to make inroads into poverty, unemployment and inequality.

The upshot of South Africa's ongoing struggle to recover from the global economic crisis is that the country's project pipeline remains dominated by public-sector infrastructure projects in the energy, transport and water sectors.

The private sector, which traditionally contributes the lion's share of fixed investment, remains wary, particularly in light of ongoing supply-side constraints, most notably associated with South Africa's volatile labour climate and its electricity shortfalls.

However, there are also several demand-side uncertainties; the most important being the outlook for commodity demand and prices in light of the slowdown in China, as that country aims to shift from investment- to consumer-led growth.

Nevertheless, capital investment, while below potential, has not stopped – a reality reflected in this edition of *Projects in Progress*, which offers updates on some of the large infrastructure developments and private projects being undertaken across South Africa.

State-owned electricity utility Eskom, for example, is implementing some of the largest capital projects ever undertaken to alleviate South Africa's electricity supply shortfalls.

This publication contains insight into progress at the delayed Medupi and Kusile coal-fired projects, in Mpumalanga and Limpopo respectively, as well as at the Ingula pumped-storage scheme, which is under construction on the border between the Free State and KwaZulu-Natal.

It also reflects on progress in the roll-out of greenfield renewable-energy projects by private producers and on the development of two new open-cycle gas turbines.

Some of the 'big ticket' freight and passenger transport projects also receive attention, as does the development of new dams and bulk water transfer schemes.

The resources sector continues to dominate the private-project pipeline, which includes expansion and replacement projects in the coal, diamond, gold, platinum, ferrous minerals and uranium sectors.

This edition of *Projects in Progress* shows that domestic project economy continues to tick over, albeit with few signs of fireworks.

Martin Creamer
Publishing Editor

ENGINEERING PROJECTS

Electricity

Industrial

REIPPPP

Transport & Logistics

Water & Sanitation



Picture by Chief Photographer Diane Davis



Sophisticated Cement

Electricity

Although South Africa has avoided rolling blackouts since the power crunch of 2008, State-owned power utility Eskom is waging an ongoing battle to supply electricity to the industry and consumers. In February this year, the parastatal declared a power emergency for the first time since the power crunch in 2008, while bringing overdue power plants on line and maintaining its current power station fleet.

To deal with the mismatch between supply and demand, Eskom is engaged in a massive capacity expansion programme to alleviate South Africa's electricity supply challenges. The capacity

expansion programme includes Eskom's Ingula pumped-storage scheme; the Kusile and Medupi coal-fired power plant projects, in Mpumalanga and Limpopo respectively, all of which aim to bring substantial additional power generation capacity on line by 2019.

The Department of Energy is also facilitating the introduction of new peaking power from two open-cycle gas turbines – Dedisa, in the Eastern Cape, and Avon, in KwaZulu-Natal. The R9.7-billion power projects will have a combined nameplate capacity of 1 005 MW.



Picture by Oriel Photographer Duane Davis

DEPARTMENT OF ENERGY PEAKER PROJECTS

Name and Location

Department of Energy (DoE) peaker projects, South Africa.

Client

DoE.

Project Description

The project involves the construction of two greenfield open-cycle gas turbine (OCGT) power plants of 335 MW (Dedisa) and 670 MW (Avon), in the Eastern Cape and KwaZulu-Natal respectively, with a combined capacity of 1 005 MW.

Each facility will also have on-site fuel and water storage for a continuous 45-hours of full-load operations.

Value

The total investment cost for the two plants is about €780-million.

Duration

Commercial operation is expected to start at Dedisa in 2015 and at Avon in 2016.

Latest Developments

The Dedisa and Avon peaking power projects were named the Euromoney Project Finance Magazine's Africa Power Deal of the Year for 2013 in February this year.

The financing for the independent power project peaking projects was facilitated by coordinating mandated lead arrangers (MLAs) Nedbank, Investec, Absa and the Development Bank of Southern Africa, and MLAs Rand Merchant Bank and Sanlam, who were responsible for negotiating the finance documentation and settling the project documentation.

Nedbank Capital was the largest lender in the consortium having underwritten R2-billion of the projects' senior debt.

The projects, which are being developed by a consortium led by international energy group GDF SUEZ, reached financial close in August last year, with construction starting in September.

Key Contracts and Suppliers

GDF SUEZ consortium, comprising GDF SUEZ (38%), Legend Power Solutions, of South Africa (27%), Mitsui & Company, of Japan (25%) and The Peaker Trust, representing black economic-empowerment and community interests, 10% (build, own and operate contract); Ansaldo Energia and Fata (turnkey engineering, procurement and construction) and Merz and McLellan (owner's engineer).

On Budget and on Time?

The peaker projects have been subjected to several delays, with the DoE having initially selected an AES-led consortium as the preferred bidder, before terminating talks in April 2008. Negotiations were subsequently launched with the GDF SUEZ-led consortium.

The DoE eventually awarded the contract to a consortium comprising GDF SUEZ (38%), Legend Power Solutions, of South Africa (27%), Mitsui, of Japan (25%) and The Peaker Trust, representing black economic-empowerment and community interests (10%).

In June, the consortium signed a 15-year power purchase agreement with Eskom.



Picture by Chief Photographer Duane Davis

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Merz and McLellan, **Jo Reeves**, cell + 27 76 984 4485.

ESKOM'S INGULA PUMPED STORAGE SCHEME

Name and Location

Ingula pumped-storage scheme project, on the border between the Free State and KwaZulu-Natal provinces, South Africa.

Client

Eskom.

Project Description

The Ingula pumped-storage scheme, located within the Little Drakensberg mountain range, 23 km north-east of Van Reenen's Pass, will comprise an upper dam (Bedford) and a lower dam (Braamhoek). The upper reservoir site is located in the Free State and the lower reservoir site in KwaZulu-Natal. The escarpment forms the border between the two provinces.

The distance between the upper and lower reservoirs will be 4.6 km, with an elevation difference of about 470 m.

The reservoirs will be connected through underground waterways and the underground powerhouse complex, which will house four 333 MW pump turbines with a total capacity of 1 332 MW, a machine hall, a transformer hall and associated tunnels, shafts and caverns.

The twin headrace waterways, consisting of concrete and steel-lined headrace tunnels, pressure tunnels and shafts, will link the upper reservoir with the pump turbines. The draft tubes, concrete-lined surge shafts and a single concrete-lined tailrace tunnel will connect the pump turbines to the lower reservoir.

The upper reservoir is a concrete-faced rock-fill embankment dam, 41 m high, with a total capacity of 22.4-million cubic metres and an active water storage volume of 19.2-million cubic metres. The 39-m-high lower dam comprises roller-compacted concrete, with a total capacity of 26.3-million cubic metres and an active storage volume of 21.9-million cubic metres.

The scheme will be operated on a weekly cycle and will have an overall cycle efficiency of 78%.

Value

R25.9-billion. As at December 31, 2013, R18.8-billion had been spent.

Duration

The pumped storage scheme is planned to be fully operational in 2015.

Latest Developments

Eskom has reported in its New Build News for January 2014 that excavation and rock support works on the underground works have been completed and that civil works, together with the installation of the turbine units and other mechanical items, are under way. Civil works include the placement of about 500 000 m³ of concrete.

The civil works activity remains critical in terms of the overall project completion, owing to access requirements for the transformer and electrical packages. The intake and outlet structures have been completed.

Other major underground works activities under way, as at December 31, 2013, are:

- the construction of intake channel slabs and walls, intake structure with operations and maintenance building construction 43% complete.
- surge Shaft 3 and 4 post tensioning, which is 70% complete.
- inclined high-pressure shafts (IHPS) 1/2 and 3/4, with the low-pressure head race tunnel (LPHT) 1/2 concrete lining 85% complete and grouting activities in LPHT 3/4 45% complete.
- grouting at the high-pressure penstocks (HPPs) 2 and 4 are 100% complete, with at HPP 3 being 45% complete and HPP 1 being 25% complete.

- the tailrace tunnel, with steel fixing, is 98% complete, with concrete lining 97% complete and the grouting 29% complete.
- construction at surge chamber base 3/4 is 97% complete and surge chamber base 1/2 80% complete.
- the exploratory/cable access portal structure, with portal structure construction 95% complete.
- the machine hall (MH) Unit 3 concreting of floor slabs and generator floor is 100% complete and the operating floor is 10% complete.
- the MH Unit 4 concreting of the floor slabs and the generator floor is 100% complete.
- the concrete to first floor level west of the control room is 10% complete and the concrete of the intermediate level east is 45% complete.

Activities under way on the main underground works package, as at December 31, 2013, include:

- the continuation of the construction of intake structure operations and management building;
- the grouting of LPHT 3/4 and the concrete lining of LPHT 1/2;
- the concrete lining and grouting activities in the tailrace tunnel.
- the surge chamber base 3/4 top slab and the top slab of surge chamber base 1/2 will also be completed.

Key Contracts and Suppliers

The Braamhoek Consultants Joint Venture (BCJV), consisting of Gibb, Knight Piésold and SSI (civil, mechanical and electrical engineering, detailed design, tender documentation, design monitoring and construction supervision); Murray & Roberts (exploratory tunnel); Grinaker-LTA (access roads); CMI JV, comprising CMC di Ravenna, PG Mavundla and Impregilo (underground civil works); Afriscan (water supply, sewage treatment, small access roads and building temporary Eskom offices); B&E Quanza Group (aggregate quarry); Acer [Africa] (environmental consultants); Braamhoek Dam JV (BDJV), comprising Concor Roads & Earthworks, Wilson Bayley Holmes-Ovcon, Edwin Construction and Silver Rock (dam contract); Voith Siemens Fuji Hydro Power Generation (main generating plant); Deutsche Bank (R1-billion loan); Voith (mechanical auxiliary plant and turbines and generators) ABB (electrical balance of plant); NCC Environmental Services (independent environmental control officer services); Konecranes (heavy-duty cranes); Letacla (fibre-optic communications) and Siemens (generator transformers).

On budget and on time?

The first 333 MW unit was initially expected to be commissioned by January 2013; however, it will only be commissioned during the first quarter of 2015.

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ESKOM'S KUSILE POWER PLANT PROJECT

Name and Location

Kusile power plant project, Mpumalanga, South Africa.

Client

Eskom.

Project Description

The Kusile power station, which will be located near the existing Kendal power station, in the Nkangala district of Mpumalanga, will comprise six units each rated at an estimated 800 MW installed capacity, giving a total capacity of 4 800 MW. Once completed, Kusile will be the fourth-largest coal-fired power station in the world.

The Kusile project will include a power station precinct, power station buildings, administrative buildings (control buildings and buildings for medical and security purposes), roads and a high-voltage yard.

The associated infrastructure will include a coal stockyard, coal and ash conveyors, temporary and permanent water-supply pipelines, temporary electricity supply during construction, water and wastewater treatment facilities, ash disposal systems, a railway line, limestone offloading facilities, access roads (including haul roads) and dams for water storage, as well as a railway siding and/or a line for the sorbent (limestone) supply.

The power station will be the first in South Africa to install flue-gas desulphurisation (FGD) – a state-of-the-art technology used to remove oxides of sulphur, such as sulphur dioxide, from exhaust flue gases in power plants that burn coal or oil. This technology is fitted as an atmospheric emissions abatement technology, in line with current international practice, to ensure compliance with air quality standards, especially since the power station is located in a priority air shed area.

The FGD plant is a totally integrated chemical plant using limestone as feedstock and producing gypsum as a by-product. Each supercritical tower boiler (highly efficient) will be about 115 m high. The air-cooled condensers (ACC) will be constructed on and supported by twenty 50-m-high concrete columns.

The plant will use an air-cooling system to help conserve water. A total of 16 000 t of structural steel was used for the first unit's boiler construction and it is expected that 115 400 t of structural steel will be used for all six units. To date, more than 600 000 m³ of concrete has been used at the site.

Kusile has one of the largest concrete batch plants in South Africa. The operational life of the power station is expected to be 60 years. The total estimated cabling to be installed for each Kusile unit is 1 000 km per unit.

The bulk of the coal will be sourced from mine mouths in the local area, with further exploration ongoing.

Value

The project is being developed at a cost of R118.5-billion and Eskom has spent R68.2-billion to date.

Duration

Although the project has had some delays, the first generating unit is scheduled to enter the South African electrical grid by the second half of 2015, with the subsequent five units being commissioned at eight- and then 12-month intervals thereafter. The last unit is expected to be in commercial operation by 2019.

Latest Developments

Eskom reported in its January New Build News that the overall project was 55.9% complete.



The utility has reported the following progress:

- the Unit 3 steam turbine tabletop has been constructed and completed on time without quality issues.
- civil engineering has completed the construction of the foundation, making way for mechanical engineers to install the auxiliary boiler.
- the Unit 3 turbine pedestal pour was achieved on July 17, 2013.
- the raw water pipeline/truck fill station was commissioned on August 19, 2013.
- the set Unit 1 generator stator was completed in September 2013.
- the mobile demineralisation plant became operational on September 9, 2013.
- the backfeed station services building was completed on December 11, 2013.
- the fly ash silos are 99.1% complete.
- progress on auxiliary cooling towers is 86.9% against the planned 97.8%.

Key Contracts and Suppliers

Ninham Shand Consulting Services (environmental-impact assessment, geotechnical investigation and traffic impact); AirShed Planning Professionals (air-quality impact); Jongens Keet Associates (noise impact); Strategic Environmental Focus, or SEF (visual impacts); Makecha Development Association (impacts on terrestrial fauna and flora); Golder Associates, through Ecosun (aquatic-ecosystem impact); Groundwater Consulting Services (groundwater impact); Ilitha Riscom (risk assessment); Northern Flagship Institution (archaeological impact); University of the Free State (impacts on agricultural potential); Urban-Econ, or UE (socioeconomic impacts); Seaton Thomson & Associates (planning implications); Mark Wood Environmental Consultants (process review); Eskom; in partnership with Black & Veatch International (project management and engineering services); Hitachi Power Africa, a subsidiary of Hitachi Power Europe, or HPE (boiler contract); Actom, formerly Alstom S&E Africa (main turbine area); Alstom (turbine contract and distributed control system); Mikropul, subcontracted by Alstom (axial-flow fans and auxiliary equipment for the turbine halls' ventilation); Murray & Roberts, or M&R (boiler construction contract); Roshcon, a subsidiary of Eskom (enabling civils, terracing construction and site services); Concrete Finishing Equipment (dust filters and silo and environmental safety); the Kusile Civil Works, or KCW Joint Venture (JV), comprising Stefanutti Stocks, Basil Read, Group Five and Wilson Bayly Holmes-Ovcon (WBHO) Construction (main civil works); BHR Piping Systems (bending machine); Siemens (generator transformers and electrical and auxiliary power); EsorFranki Geotechnical, formerly Franki Africa and Stefanutti Stocks Geotechnical (SSG JV), under a subcontract to the KCW JV (piling works for the turbine, boiler and air-cooled condensers, or ACC); Concor Karrena JV (construction of chimney shells/structures); Alstom, in consortium with Cosira (engineering, supply and installation of FGD system); DSE Structural Engineers & Contractors, subcontracted by Genrec Engineering (fabrication of steel columns for boilers 1 to 3); Steel Services Direct, or SSD (steel, pipes and wax plants); GB Bearings (supplier of HSR horizontal bearing assemblies and profile bore bearings); Sulzer Pumps South Africa, subcontracted by Actom (supply of booster and boiler feed pumps); Steloy Castings, subcontracted by Sulzer Pumps South Africa (supply of chrome steel components for the pumps); Clyde Bergemann Power Group, subcontracted by Hitachi Power Africa (supplier of sootblowers for boilers); Clyde Bergemann Africa (fly ash handling system); ABB (supplier of medium-voltage switchgear and associated equipment); PD Naidoo & Associates (PDNA) Industrial Projects (main water and wastewater treatment contractor); GE Water Engineered Systems, subcontracted by PDNA Industrial Projects (advanced water and wastewater treatment equipment); Bateman Africa (coal stockyard and terrace material materials handling systems); Lesedi Nuclear Services (procurement and supply of the balance of plant equipment); Grinaker-LTA Metals and Minerals (supply and erection of piping, steelwork and free-issue chemicals); US Export-Import Bank, or Ex-Im Bank (loan finance); TBD (railroad construction) and combustion water terrace construction (Phase 1 and 2) and Konecranes (heavy-duty cranes).

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ESKOM'S MEDUPI POWER PLANT PROJECT

Name and Location

Medupi power station project, Limpopo, South Africa.

Client

Eskom.

Project Description

Medupi is located on an 883 ha site in Lephalale, Limpopo. It will be a dry-cooled coal-fired, baseload power-generating plant, comprising six 800 MW units, with a 4 800 MW installed capacity. It will be the fourth-largest coal plant in the southern hemisphere and the biggest of its kind with dry cooling in the world.

The planned operational life of the station is 50 years.

The power station will use high-tech supercritical boilers, which will operate at higher temperatures and pressures than older boilers, thereby providing greater efficiency.

It is the first baseload coal-fired station to be built in South Africa in more than 20 years and its delivery on schedule is viewed as critical.

The project is unique because Medupi is being built backwards – traditionally Eskom has always started building Unit 1 and ended with Unit 6. This new approach is the result of the rock conglomeration on the southern side, which is excavated and reused as the engineering fill on the northern side.

The project will form part of the utility's integrated strategic electricity plan and is designed to be flue-gas desulphurisation (FGD) ready.

Value

The cost of the project has increased from R91.2-billion to R105-billion.

Duration

Construction activities started in May 2007. The first unit, Unit 6, will be synchronised to the grid in the second half of 2014.

Latest Developments

Outgoing Eskom CEO **Brian Dames** has confirmed that Eskom has "exercised its contractual rights" by appointing Siemens to replace Alstom as the supplier of the boiler protection system (BPS) for Units 6 and 5 at the Medupi power station project. The change to the BPS contract has not resulted in a revision of Eskom's guidance that Medupi's first 800 MW unit, or Unit 6, will become operational during the second half of 2014.

Alstom remains responsible for the other elements of the control and instrumentation (C&I) system at Medupi, including the balance-of-plant operations, the field instrumentation and the unit-control system.

The BPS forms part of a larger C&I package for which Alstom remains responsible. Alstom South Africa's **Riccardo Pierobon** has described the BPS as a small part of its overall C&I contract, adding that the other systems are "performing to specification". The French multinational is also installing the turbines and generators, which represents the "vast bulk of Alstom's work on this plant".

Meanwhile, progress at Medupi continues, with the utility reporting in its January 2014 New Build News that:

- on 10 February 11, the back Unit 6 generator and transformers were back-energised through the distributive control system (DCS).
- at the end of January, the incoming coal system from the 10 000 t silo went live, with the under silo feeder conveyors and DCS being successfully commissioned.

- the Unit 3 feed water tank has been pressure tested successfully, allowing for the remainder of the in and out water piping to be installed.
- the turbine hall Unit 4 lube oil room has been handed over for installation of the equipment for the turbine lube oil system.
- the civil works for the coal stockyard pollution control dam has been completed.
- two of the auxiliary plant fans have been safety cleared, with test runs completed and the area subsequently being declared safe for commissioning and testing activities.
- four of the five auxiliary systems have been safety cleared and commissioning is in progress.
- the C&I DCS at the coal silo for feeder No 1 and 2, located at the Exxaro coal mine, has been safety cleared and is ready for commissioning.
- the ash dump substation switchgear room epoxy has been completed, which will provide access to allow for the cable for the ash dump system and to connect the switchgear that will enable the power-up of the system.
- the oil pipeline can be installed from the unloading bay to the bulk fuel oil pump house for bulk fuel oil unloading.
- the bulk fuel offloading system has been successfully commissioned and the latest load of fuel oil – 200 t of bunker 150 fuel oil – can be offloaded using the DCS controls.

It was further reported by Eskom that:

- in September 2013, the Unit 4 generator motor was threaded into the stator. This action requires precision, as the clearance is only a few millimeters. All stationary equipment between the rotor and the stator can now be fitted and the generator coupled to the LP2 rotor. Further, the wet run of the submerged scraper conveyer has been successfully completed. This system removes the ash from the bottom of the boiler – another essential step in getting the boiler ready for first fire.
- in January, the boiler separators, which were initially installed for Unit 6, were successfully cut out. The new replacement separators will now be installed to separate the steam and steam-water droplets.
- in February, following close cooperation between team Medupi and the contractors, all boiler issues were resolved, resulting in the boiler frame for Unit 1 being installed to start. On February 10, the back energising of the Unit 6 generator and unit transformers through the distributed control system started.

Key Contracts and Suppliers

Main packages:

Parsons Brinckerhoff (execution partner); Roshcon (enabling civils); Rula Bulk Material Handling (coal overland conveyor and ash dump conveyor); Hitachi Power Africa (boiler); Alstom S&E Africa (turbine); LP Services consortium (engineering, procurement and construction contract for the low-pressure services); Ovivo Aqua SA (water treatment plant); Karrena-Concor joint venture, or JV (chimneys and silos); MPS JV (main civils); Actom (electrical power installation); General Electric (low-voltage switchgear system); Actom (medium-voltage switchgear); Siemens (auxiliary transformers and generator transformers); Standby Systems (UPS); Alstom C&I (C&I); Honeywell Automation and Control Solutions South Africa (CBMS); T-Systems (information technology (IT) and IT infrastructure); Siemens ACI Open Consortium (laboratory and analysers); Civcon/G4 JV (miscellaneous infrastructure and reservoirs); Basil Read (buildings Phase 2, ash dump infrastructure and clarifiers); NCI (diesel generators); ThyssenKrupp Materials Handling (coal stockyard equipment); Clyde Bergemann Africa (dust handling

and conditioning systems); ELB Engineering Services (terrace coal and ash) and Aveng Grinaker-LTA (buildings Phase 1 and 3);

On budget and on time?

The project will meet the revised end-of-year deadline for the flow of first power and will cost R105-billion, excluding indirect costs.

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Industrial

South Africa's National Treasury's Budget Review 2014 states that public-sector investment will total R847.3-billion over the next three years, equivalent to 7% of gross domestic product each year. This investment in infrastructure is expected to release constraints on greater private-sector output and encourage private investment.

In previous years, Finance Minister Pravin Gordhan has highlighted the key role that private companies have to play in South Africa's economy, with the private sector expected to become the major contributor to job creation in South Africa in the coming years. In Gordhan's Budget speech in February this year, he noted that the private sector was making an increasing

contribution to infrastructure investment, highlighting the conclusion of contracts for 47 renewable-energy projects in 2012 and 2013, which represented investments of about R70-billion, among others.

For example, Atterbury Property Group is investing more than R25-billion in the Waterfall Business Estate, in Gauteng, a 1.6-million-square-metre mixed-use commercial development; and Sephaku Cement, which is investing about R3.3-billion in the construction of the Aganang integrated cement production facility, 35 km west of Lichtenburg, in the North West; and in a cement-grinding facility, in Delmas, Mpumalanga.

ATTERBURY PROPERTY GROUP'S WATERFALL BUSINESS ESTATE PROJECT

Name and Location

Waterfall Business Estate, Gauteng, South Africa.

Client

Atterbury Property Group.

Project Description

The Waterfall Business Estate is a 1.6-million-square-metre mixed-use commercial development. It spans land on both sides of the N1 highway – from the Woodmead interchange through the Buccleuch interchange to the Allandale interchange and joins Modderfontein in the east and reaches beyond Kyalami in the west.

The development master plan includes 200 000 m² of offices. Light and high-tech industrial property will be located in the Logistics Precinct, the Distribution Campus, the Commercial District, Landmark Park and Factory Depot, opposite the Gautrain maintenance yard. Retail will feature in the Lifestyle Estate, serving Waterfall's residential estates near Kyalami.

The heart of Waterfall will be the 800 000 m² mixed-use Waterfall City. It will feature a mix of retail in a 115 000 m² shopping precinct, with offices and homes.

Value

The project will have a total value of well over R25-billion.

Duration

The development of the project will be market-driven and rolled out over the next 14 years.

Latest Developments

Atterbury and JSE-listed Attacq have launched the 800 000 m² mixed-use Waterfall City, marking the next phase of commercial development at the 1.6-million-square-metre mixed-use Waterfall Business Estate.

The 330 ha Waterfall City will, once complete, offer retail, office and residential space, as well as hotels, a hospital and several parks.

Currently under construction at the nucleus of Waterfall City is the R3.5-billion super-regional Mall of Africa which, at 120 000 m², will be South Africa's largest single-phase shopping mall development, once it begins trading in April 2016.

Meanwhile, the Waterfall City Netcare Hospital is already fully operational, while the 4 100 m² 150-bed City Lodge Hotel will open its doors in November.

Atterbury also has the rights to develop 1 200 urban residential units in Waterfall City.

In addition to premium-grade corporate offices, the development will accommodate tenant-driven low-density office developments, including the Maxwell Office Park, motor dealerships and other businesses.

Atterbury would begin construction on 7 000 m² corporate offices at Waterfall City for pharmaceutical firm Novartis later this month, while it has already started work on offices for medical technology developer Dräger, Angle Shack, communications firm Westcon and foodstuff producer Premier Foods.

The four large projects completed to date in the Waterfall Business Estate include the 44 200 m² Cell C campus, the 26 286 m² MBT Technologies premises, the 23 139 m² Group Five head office and the 6 198 m² Golder & Associates head office.

Key Contracts and Suppliers

Standard Bank (finance).

On Budget and on Time?

Not stated.

Contact Details for Project Information

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SEPHAKU CEMENT PROJECTS

Name and Location

Sephaku Cement projects, South Africa.

Client

Sephaku Cement, a subsidiary of Nigeria-listed Dangote Cement (64%) and associate of JSE-listed Sephaku Holdings (36%).

Project Description

The projects entail the construction of the Aganang integrated cement production facility, 35 km west of Lichtenburg, in the North West; and a cement-grinding facility, in Delmas, Mpumalanga.

It is estimated that the Aganang and Delmas cement plants will collectively deliver about 2.5-million tons a year of cement.

The Aganang operations will include limestone mining and the chemical processing of raw materials to produce clinker. The limestone deposit is located on the Stiglingspan, Verdwaal and Klein Westerford farms, 7 km south-west of Itsoseng. About half of the clinker will be ground, milled and blended to produce cement. The rest will be transported to the Delmas plant for further processing using fly ash produced at the fly ash classification plant, at Kendal power station, as an extender to produce the final cement.

The limestone quarry and the cement project have an expected life of between 30 and 40 years, depending on the availability of the delineated mineral resources and the guaranteed kiln production figures.

Value

Construction of the Aganang and Delmas plants will cost about R3.3-billion. Funding of the project is through secured shareholder

equity of R1.2-billion and loan funding secured from Nedbank and Standard Bank.

Duration

Sephaku started construction on the Aganang and Delmas cement production facility in late 2011.

First production from the Delmas plant started in January 2014, with production from the Aganang plant expected in the second quarter of this year.

Latest Developments

Cement production started at Sephaku's 1.4-million-ton-a-year Delmas milling plant in January and will ramp up to full output by mid-2014.

The cement producer has dispatched the first bags of cement from the plant to customers in Gauteng, Mpumalanga and Limpopo.

The commissioning of Aganang is under way, with production expected to start by the second quarter of this year.

Key Contracts and Suppliers

Nedbank Capital and Standard Bank (finance); Sinoma International Engineering (construction); Eskom (power-supply agreement for the plant in the North West) and Africa Geo-Environmental Services (environmental consultant for Limpopo plant).

On Budget and on Time?

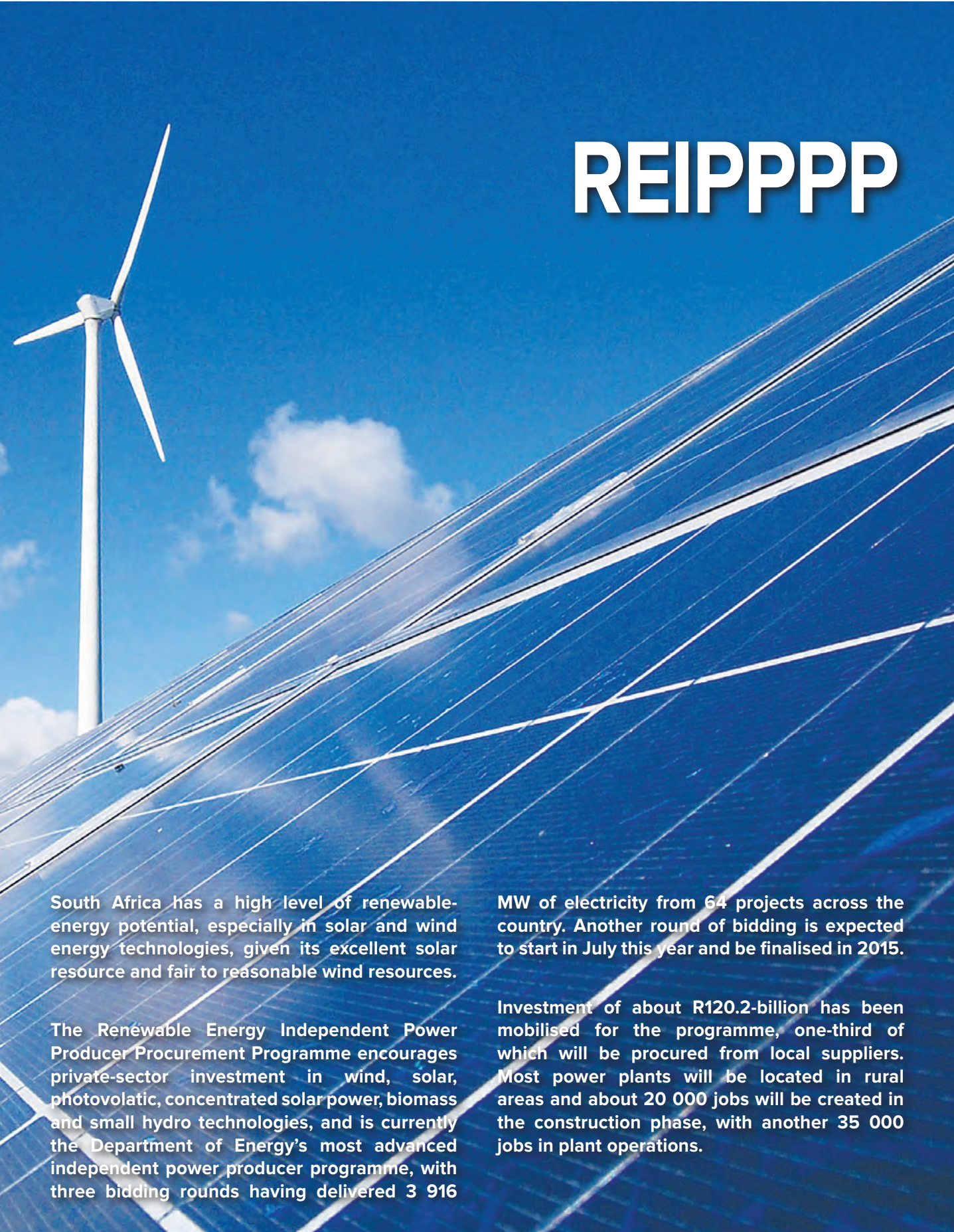
Not stated.

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Source: Sephaku Cement



REIPPPP

South Africa has a high level of renewable-energy potential, especially in solar and wind energy technologies, given its excellent solar resource and fair to reasonable wind resources.

The Renewable Energy Independent Power Producer Procurement Programme encourages private-sector investment in wind, solar, photovoltaic, concentrated solar power, biomass and small hydro technologies, and is currently the Department of Energy's most advanced independent power producer programme, with three bidding rounds having delivered 3 916

MW of electricity from 64 projects across the country. Another round of bidding is expected to start in July this year and be finalised in 2015.

Investment of about R120.2-billion has been mobilised for the programme, one-third of which will be procured from local suppliers. Most power plants will be located in rural areas and about 20 000 jobs will be created in the construction phase, with another 35 000 jobs in plant operations.

Source: Sharp

RENEWABLE ENERGY INDEPENDENT POWER PRODUCER PROCUREMENT PROGRAMME – FIRST WINDOW

Name and Location

Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) – first window, nationwide, South Africa.

Client

Department of Energy (DoE).

Project Description

The REIPPPP first-round projects are among an initial batch of 53 bids submitted for the November 2011 bid window and represent a potential capacity of 1 415.52 MW and potential investment of billions of rands.

The preferred bidders include 18 solar photovoltaic (PV) projects, eight onshore wind projects and two concentrating solar power (CSP) projects.

The solar PV projects named are:

- SlimSun Swartland solar park (5 MW)
- Rustmo1 solar farm (6.76 MW)
- Mulilo Renewable Energy Solar PV – De Aar (9.65 MW)
- Konkoonsies Solar (9.65 MW)
- Aries Solar (9.65 MW)
- Greefspan power plant (10 MW)
- Herbert power plant (19.9 MW)
- Mulilo Renewable Energy Solar PV – Prieska (19.93 MW)
- Soutpan solar park (28 MW)
- Witkop solar park (30 MW)
- Touwsrivier project (36 MW)
- De Aar solar PV (48.25 MW)
- South African Mainstream Renewable Power Droogfontein project (48.25 MW)
- Letsatsi Power Company (64 MW)
- Lesedi Power Company (64 MW)
- Kalkbult project (72.5 MW)
- Kathu solar energy facility (75 MW)
- Solar Capital De Aar (75 MW)

The combined capacity of the solar PV projects that progressed through to the preferred-bidder stage was 631.53 MW.

The wind projects listed include:

- Dassiesklip wind energy facility (26.19 MW)
- MetroWind Van Stadens wind farm (26.19 MW)
- Hopefield wind farm (65.40 MW)
- Noblesfontaine (72.75 MW)
- Red Cap Kouga wind farm – Oyster Bay (77.6 MW)
- Dorper wind farm (97 MW)
- Jeffreys Bay project (133.86 MW)
- Cookhouse wind farm (135 MW)

The wind projects represent a combined capacity of 633.99 MW.

The two CSP projects named were Khi Solar One (50 MW) and KaXu Solar One (100 MW).

The DoE aims to produce 1 450 MW of solar PV, 1 850 MW of onshore



wind, 200 MW of CSP, 75 MW of small hydro, 25 MW of landfill gas and 12.5 MW apiece of biomass and biogas capacity.

Value

The projects represent a total investment value of about R47-billion.

Duration

Under the original schedule, these first-bid-window projects were expected to reach financial closure by mid-June 2012. The process was delayed to enable government to finalise a support framework for Eskom, which would purchase the power produced by the independent power producers (IPPs). Financial closure is now scheduled for November 5.

Latest Developments

The solar PV projects:

This first phase of SlimSun's Swartland solar park project is scheduled for commercial operations in July 2014. The second 17 MW phase is still under development.

Momentous Energy's 6.8 MWp Rustmo1 solar PV project, in Rustenburg, in the North West, which began construction in February, has been completed and connected to State-owned power company Eskom's electricity grid through a new 22/88 kW substation.

Globeleq's Droogfontein solar project in Kimberley, in the Northern Cape, is on track and is expected to be fully operational before the planned commercial operation date of April this year, the company reports. Meanwhile, the company's De Aar solar PV power project, also in the Northern Cape, started exporting power into the De Aar municipality line on December 3.

BioTherm Energy's Aries and Konkoonsies solar PV energy facilities, in the Northern Cape, reached commercial operation in December 2013, delivering a combined 20 MW of electricity to the national grid. The projects, which were selected in the first round of the REIPPPP in November 2011 and successfully reached financial close a year later, each comprise about 45 000 solar PV modules and will supply power to the national grid for the next 20 years through a power purchase agreement (PPA) secured with Eskom's single buyer office.

AE-AMD Renewable Energy – a joint venture between Spain-based AMDA Energia and South Africa-based Alt-E Technologies – and Tenesol, a SunPower subsidiary, are working on the Herbert (22 MW) and Greefspan (11 MW) ground-mounted solar PV projects, in the Northern Cape. The projects are expected to be completed in the second quarter of 2014.

SunEdison's Soutpan (28 MW) and Witkop (30 MW) solar parks are expected to start producing electricity early this year.

Soitec concluded a R1-billion bond issuance to finance the construction of the Touwsrivier solar PV plant, in the Western Cape, in May.

Solar Reserve's Lesedi and Letsatsi projects are expected to be completed by mid-2014.

Scatec Solar South Africa's 75 MW Kalkbult project, in the Northern Cape, officially opened on November 12, 2013. The plant will generate 135-million kilowatt hours a year, equivalent to the yearly electricity consumption of 33 000 households. The plant was fully commissioned in ten months, with construction starting in late November 2012 and electricity delivery to the grid starting on September 27, 2013.

Construction company Wilson Bayly Holmes-Ovcon and Italian renewable-energy developer and operator Building Energy's Kathu solar PV park has been described as one of the largest solar projects worldwide, incorporating single-axis tracking technology. Drawdown on the project's R2.9-billion debt began on November 19, 2012, and construction on the plant is expected to be completed within 21 months.

The wind projects:

BioTherm Energy's Dassiesklip wind energy project started to export power to the Eskom grid on December 19, 2013, when the first turbine entered the performance testing phase.

The 27 MW MetroWind Van Stadens wind farm officially started commercial operations in February this year. The facility, which is located in the wind-endowed Nelson Mandela Bay municipal area of the Eastern Cape, has been supplying power into the regional grid since late November, but the 'facility completion' milestone was officially achieved on February 2.

Umoya Energy's Hopefield wind farm, which comprises thirty-seven 1.8 MW wind turbines, achieved commercial operation in February. The wind farm will generate enough electricity to power about 70 000 low-income homes, or 29 000 medium-income homes.

Gestamp Wind signed a PPA for the Nobelsfontaine wind farm project with the DoE in November 2012. The project involves investment of €120-million. It is expected to be in operation this year.

Red Cap's Kouga wind farm is on track for commissioning towards the end of this year, with the transportation of the components from the Coega port to the wind farm site under way. The erection of the turbines started in February and will be complete in about September. The wind turbines

will be commissioned from about June to October this year. Substantial completion of the wind farm will be in November.

Rainmaker Energy's estimated R2-billion Dorper wind farm project, in the Eastern Cape, is expected to generate 100 MW of energy.

At Globeleq's Jeffreys Bay wind farm project, in the Eastern Cape, all 60 turbines have been installed at the 138 MW wind farm, in the Eastern Cape, with the project, which is already supplying electricity to Eskom, expected to enter commercial operations in May.

Sixteen of the 66 turbines for African Clean Energy Developments' Cookhouse wind farm have been erected. Scheduled commercial operations are slated for May 31. The wind farm will have an installed capacity of 138.6 MW.

The CSP projects:

The construction of Abengoa's 50 MW Khi Solar One tower, in Upington, in the Northern Cape, was completed in August 2013. The plant will use advanced technology specifically developed for the country's needs. The plant along with the company's 100 MW KaXu Solar One plant, in Pofadder, in the Northern Cape, will be able to store energy and generate power after sunset.

Key Contracts and Suppliers

Arup (lender's technical adviser or owner's engineer); Robor (steel supply) and ACS Cobra, Gransolar and Kensani Energy (engineering, procurement and construction work for Letsatsi and Lesedi solar PV projects).

On Budget and on Time?

Too early to state.

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RENEWABLE ENERGY INDEPENDENT POWER PRODUCER PROCUREMENT PROGRAMME – SECOND WINDOW

Name and Location

Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) – second window, nationwide, South Africa.

Client

Department of Energy (DoE).

Project Description

The DoE has announced 19 companies as the preferred bidders for the second window of the REIPPPP, which closed on March 5, 2012. The 19 projects represent 1 043.9 MW of capacity.

The preferred bidders include nine solar photovoltaic (PV) projects, seven onshore wind projects, two small hydropower projects and one concentrated solar power (CSP) project.

The solar PV projects named are:

- De Aar 3 (75 MW)
- Sishen solar facility (74 MW)
- Aurora (9 MW)
- Vredendal (8.8 MW)
- Linde (36.8 MW)
- Dreunberg (69.6 MW)
- Jasper Power Company (75 MW)
- Boshoff solar park (60 MW)
- Upington solar PV (8.9 MW)

The combined capacity of the solar PV projects that progressed to the preferred-bidder stage was 417.1 MW.

The wind projects listed include:

- Gouda wind facility (135.2 MW)
- Amakhala Emoyeni, Phase 1 (137.9 MW)
- Tsitsikamma Community wind farm (94.8 MW)
- West Coast 1 (90.8 MW)
- Waainek (23.4 MW)
- Grassridge (59.8 MW)
- Chaba (20.6 MW)

The wind projects collectively represent 562.5 MW of capacity.

The preferred small hydropower bidders are Stortemelk Hydro project (4.3 MW) and Neusberg hydroelectric project A (10 MW) for a combined 14.3 MW of capacity.

The one CSP project named is the 50 MW Bokpoort CSP project.

Value

The second-round projects are collectively valued at nearly R28-billion.

Duration

The signing by the DoE and Eskom of the second tranche of power purchase agreements (PPAs) was concluded in May this year.

Latest Developments

The solar PV projects:

Solar Capital's 75 MW De Aar 3 solar project started supplying power to Eskom's power grid in the De Aar municipality on December 3, 2013.

Acciona Energy South Africa and Aveng Africa's R1.8-billion Sishen solar PV power project, in the Northern Cape, is expected to come on line this year. Shipment of the solar modules for the facility, which are being supplied by JinkoSolar, started in November 2013 and will continue until September 2014. As at December 2013 the project was about 12% complete. The project is expected to be completed by December this year.

Scatec Solar signed the final agreements with South Africa's DoE in May for two solar PV projects that will be located at Linde, in the Northern Cape, and Dreunberg, in the Eastern Cape.

SolarReserve, the Kensani Group and Intikon Energy's Jasper solar PV project, in the Northern Cape, will be one of the largest solar installations on the continent once completed.

SunEdison's 60 MW Boshoff solar park will be developed in the Free State and is scheduled to begin generating electricity in the fourth quarter of 2014.

The wind projects:

Acciona Energy and Aveng's Gouda wind park, in the Western Cape, was about 12% complete as at December 2013. The project is expected to be completed by May 2015.

Cennergi reached financial close on the Amakhala Emoyeni wind farm project, in the Eastern Cape, in June. The wind farm will comprise 56 Nordex turbines. Construction will start early in 2014, with the project expected to be operational in September 2016.

Cennergi's Tsitsikamma Community wind farm, in the Eastern Cape, will comprise 31 V112-3.0 MW Vesta wind turbines. Construction will start early in 2014, with the project expected to be operational in September 2016.

The West Coast 1 wind farm project, located 130 km north of Cape Town, will consist of 47 wind turbines and is expected to reach commercial operation in June 2015. GDF SUEZ holds a 43% equity stake in the project, while Investec holds 34.5% and broad-based black economic-empowerment shareholder Kagiso Tiso, 20%. The remaining 2.5% will be allocated to a community trust. Investec will act as investor and lender. In addition to investing equity in the project, Investec, jointly with Nedbank, have underwritten about R1.5-billion of debt required for the development of the wind farm.



Construction on the Grassridge wind farm, in the Eastern Cape, officially started in October 2013. The 20 Vestas turbines, which will include the towers, nacelles, hubs and blades, will be erected between July and November 2014. The farm is expected to start producing electricity in 2015.

InnoWind is developing the Chaba wind energy project. The delivery of the seven Vestas wind turbines for the wind plant is planned to start in mid-2014 with commissioning expected to start in the third quarter of 2014.

The hydro projects:

Mulilo Renewable Energy's 10 MW Neusberg project is a run-of-river small hydropower project under construction on the Orange river, near Kakamas, in the Northern Cape. Entura officially started construction on the project in October 2013. Entura's scope of work encompasses the whole life cycle of the project, from design, through construction, to ongoing support for the operation, and maintenance after completion in January 2015.

Meanwhile, construction on Nuplanet's Stortemelk Hydro project, in the Free State, was expected to start in October last year after a PPA was signed with Eskom in May.

CSP projects:

ACWA Power's Bokpoort CSP will be developed on a build, own and operate basis, with a total power generating capacity of 50 MWe net power output. Mott MacDonald has been appointed lenders' technical adviser for the project by Investec Bank and Absa Bank. This includes monitoring the 28-month construction and commissioning phase through periodic site visits. The CSP plant is expected to be commercially operational by the end of 2015.

Key Contracts and Suppliers

Suzlon Energy (wind turbines) and Vestas (wind turbines).

On Budget and on Time?

Too early to state.

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RENEWABLE ENERGY INDEPENDENT POWER PRODUCER PROCUREMENT PROGRAMME – THIRD WINDOW

Name and Location

Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) – third round, nationwide, South Africa.

Client

Department of Energy (DoE).

Project Description

Seventeen renewable-energy developers have been appointed as preferred bidders, following the conclusion of bid submissions for the third round of the REIPPPP.

The wind projects listed include:

- Gibson Bay wind farm (111 MW)
- Longyuan Mulilo De Aar Maanhaarberg wind energy facility (96 MW)
- Longyuan Mulilo De Aar 2 North Wind energy facility (139 MW)
- Nojoli wind farm (87 MW)
- Khobab wind farm (138 MW)
- Noupoot Mainstream Wind (79 MW)
- Loeriesfontein 2 wind farm (138 MW)

The wind projects collectively represent 787 MW of capacity.

The solar photovoltaic (PV) projects named are:

- Tom Burke solar park (60 MW)
- Pulida solar park (75 MW)
- Mulilo Sonnedix solar PV (75 MW)
- Mulilo Prieska solar PV (75 MW)
- Adams solar PV 2 (75 MW)
- Electra Capital (75 MW)

The combined capacity of the solar PV projects that progressed to the preferred-bidder stage was 435 MW.

The preferred concentrated solar power (CSP) bidders include Abengoa with its Xina parabolic trough CSP South Africa (100 MW), joint venture FG Emvelo's Karoshoek project (100 MW) and Cobra Energia.

One landfill gas bidder, the Johannesburg landfill gas-to-electricity project, with a capacity of 18 MW, and one biomass bidder, the Mkuze biomass project, with a capacity of 16 MW were also named.

Value

Not stated.

Duration

The winning bidders are expected to sign project agreements with the DoE by July 30, 2014, after which developers will have about one month to finalise all documentation and foreign-currency hedging before project roll-out is set to begin.

Latest Developments

Wind projects:

Red Cap's R2.25-billion, 111 MW Gibson Bay wind farm is situated in the Kouga municipality of the Eastern Cape. The 37-turbine project is expected to enter commercial operation in early 2017, generating more than 424 GWh/y.

Mainstream Renewable Power has been selected by the DoE to build the 138MW Khobab wind farm, the 138 MW Loeriesfontein 2 project and the



79 MW Noupoot plant, all located in the Northern Cape. Mainstream will be partnered in the project by South African investment firm Thebe Investment Corporation, Old Mutual's IDEAS Managed Fund, development investor Futuregrowth Asset Management, and South African renewable-energy firm Genesis Eco-Energy.

The Nojoli wind farm (88 MW), which is being developed by African Clean Energy Developments, will be owned by Italian company Enel Green Power, Pele Green Energy and the local community trust. Vestas has appointed Aurecon to conduct a detailed geotechnical investigation and preliminary roads design for the wind farm.

Solar PV projects:

Enel Green Power has been selected by the DoE to build four of the solar PV projects – Aurora, Tom Burke, Paleisheweul and Pulida. The projects will use thin-film modules produced by joint venture 3Sun. Enel expects to break ground on the sites by late August and to complete the project by August 2015.

SunPower and juwi, the engineering, procurement and construction contractors of Mulilo Renewable Energy's 75 MW Sonnedix and Prieska solar PV projects, near Prieska, in the Northern Cape, have appointed Aurecon for the engineering role to optimise the cost of design for the two projects. Aurecon will provide detailed design services for the substations, grid connections and associated overhead lines for the two projects. Once the projects reach financial close, currently expected in June 2014, construction of the two solar facilities will start and will be completed towards the end of 2015.

CSP:

Abengoa has been selected by the DoE to develop Xina Solar One, a 100 MW parabolic trough plant with a five-hour thermal energy storage system using molten salts. This project will form the largest solar complex in Africa together with Abengoa's KaXu Solar One plant that is currently under construction in the country.

FG Emvelo, a joint venture between German consortium FG.de, Emvelo, and ABB, has been selected by the DoE to build the 100 MW Karoshoek CSP project, in the Northern Cape. The plant will be based on linear Fresnel technology and will be the largest linear Fresnel plant in the world.

Cobra Energia is the other successful CSP bidder.

Landfill:

A consortium led by Ener-G Systems has been named as a preferred bidder for a R288-million project to convert gas generated at five Pikitup landfill sites in Johannesburg into electricity over a 20-year period. The methane-rich gas will be collected at Robinson Deep, Goudkoppies, Marie Louise, Ennerdale and Linbro Park, where it will be converted into electricity through on-site generators and fed into the grid through either Eskom or City Power distribution infrastructure. The electricity will be sold to Eskom for 94c/kWh. Work is under way to ensure that the project, which is being part funded by Nedbank Capital, reaches financial close by mid-2014 so that construction can start by August this year.

Biomass:

The R1.062-billion, 16.5 MW Mkuze biomass facility, wholly owned by Navosyn, is situated in Mkuze, 150 km north of Richards Bay. The biomass facility will burn sugar cane tops and trash to generate high-quality baseload power. Building Energy Development Africa has 51% interest in the project, H1 Capital 16.5%, Tiestamax 30% and a local community trust 2.5%

Key Contracts and Suppliers

Futuregrowth, Rand Merchant Bank (RMB), Enel Green Power, Mainstream Renewable Power, Abengoa, Cobra Energia, Aurora Power Solutions, Total SA, Mulilo Renewable Energy, Ener-G, Red Cap, Mainstream Renewable Power, African Clean Energy Developments, FG Emvelo, Navosyn.

On Budget and on Time?

Not stated.

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Transport & Logistics

South Africa's 2014 Budget supports investment in transport infrastructure and development corridors, with investment expected to lift constraints to production.

Over the three-year spending period outlined in the Budget, large investments by the Passenger Rail Agency of South Africa will significantly improve the efficiency and safety of train travel. According to the Budget, the agency will spend R16.3-billion to upgrade Metrorail coaches, R1.1-billion to modernise 140 stations and R5.5-billion to buy locomotives over the next three years, while signalling and

telecommunication infrastructure and systems will receive an investment of R3.6-billion.

Further, State-owned logistics company Transnet, through the execution of its R300-billion-plus Market Demand Strategy, is upgrading its coal-line export channel to 81-million tons a year and thereafter to 97.5-million tons a year, and upgrading its iron-ore export channel to an eventual 82.5-million tons a year. Transnet's aim is to increase overall rail volumes of coal, iron-ore, general freight and manganese from about 200-million tons to 350-million tons.



Picture by Chief Photographer Dano Davis

PRASA'S NEW ROLLING STOCK PROCUREMENT PROGRAMME

Name and Location

New Rolling Stock Procurement Programme, nationwide, South Africa.

Client

Passenger Rail Agency of South Africa (PRASA).

Project Description

The Department of Transport, through PRASA, is to invest in a new rail rolling stock fleet-renewal programme across South Africa.

The programme will upgrade and expand the current rail infrastructure by introducing new stock for commuter rail service Metrorail, and by offering more routes between destinations in South Africa.

The aim is to replace the current old, which has reached the end of its design life.

As part of the procurement programme, PRASA aims to upgrade and construct fully functional modern maintenance depots at Braamfontein, Wolmerton, Salt River, Durban Yard and Springfield, which will support and service PRASA's new metro trains by the time the first new train sets are delivered in the first quarter of 2015. The new depots will provide for the maintenance demand of the new, increased fleet, and PRASA's existing metro trains, until 2034.

The modernisation will mainly consist of the refurbishment or upgrade of selected existing buildings, the construction of additional operational buildings and the reconstruction of the staging yards. The initial phase of the works will include the demolition of selected existing buildings in preparation for the upgrade.

The upgrade will result in the introduction of the following technologies at the depots to optimise operational efficiencies:

- new in-floor lifting system (synchronised retractable train lifting jacks);
- new universal lifting system, which allows for the synchronised lifting of different types of trains;
- underfloor wheel lathe, which enables wheel set profiling *in situ*; and
- yard signaling, to allow for the efficient control of train movements within the yards.

Value

R123-billion.

An extra R14.5-billion will be invested in signalling, new depots, modern stations and integrated ticketing.

Duration

The 20-year procurement process will comprise two periods – the first ten-year contract will run from 2015 and the second from 2025.

The first new trains are expected for delivery in 2015.

Latest Developments

The team is finalising all planning with regard to the depot modernisation programme, which will result in the temporary relocation of staff and depot activities to alternative sites to maintain the current service levels during the upgrade.

Key Contracts and Suppliers

KPMG, Gibb Engineering and Science, Interfleet Technology and Edward Nathan Sonnenbergs (ENS – feasibility study), Gibela Rail Transportation,

comprising Alstom and its black economic-empowerment equity partners (Phase 1 – rolling stock supply contract).

On Budget and on Time?

Too early to state.

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PRASA'S RAIL SIGNALLING SYSTEM PROJECT

Name and Location

Rail signalling system project, South Africa.

Client

Passenger Rail Agency of South Africa (PRASA).

Project Description

The project will include the modernisation of the rail signalling, communications and train management systems in high-volume corridors, such as Naledi, in Soweto, to Johannesburg; Pretoria to Johannesburg; Mabopane to Pretoria; Mamelodi to Pretoria; KwaMashu–Durban–Umlazi; Khayelitsha, Mitchells Plain and Philippi to Cape Town; Kraaifontein–Bellville–Cape Town and Simon's Town to Cape Town.

Value

Total value of the signalling programme is estimated at R17-billion.

Siemens has been awarded the R1-billion contract for the Gauteng Phase 1 signalling programme and for Gauteng Phase 2 signalling programme valued at R2.762-billion.

The KwaZulu-Natal new signalling contract is estimated at R1.4-billion and has been awarded to Bombardier Africa Alliance.

The Thales-Maziya consortium has been awarded the R1.87-billion contract to supply a new signalling solution to the Western Cape.

Duration

The project is scheduled for completion in 2018.

Latest Developments

PRASA has commissioned the South African arm of global engineering company Siemens to implement a €180-million railway signalling project on the Johannesburg and Pretoria rail passenger networks.

The upgrade will include the introduction of electronic interlocking systems, the upgrade or building of new relay rooms, a new train detection system, overhead and track changes, and the implementation of a custom-designed train-control operating system across the entire Gauteng network.

The building that will house the Gauteng Nerve Centre will be completed in 2015 when train controls will be transferred to the new facility.

Key Contracts and Suppliers

Siemens South Africa (supply of rail signalling system and GNC – Gauteng); Thales-Maziya (supply of rail signalling system – Western Cape); Bombardier Africa Alliance, comprising Bombardier Transportation, ERB Technologies, Basil Read, Bakara Engineering, R&H Railway Consultants, SIMS and Tractionel (supply of rail signalling system – KwaZulu-Natal) and Huawei (digital radio communications system).

On Budget and on Time?

Not stated.

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Pictures by PRASA

TRANSNET FREIGHT RAIL'S COAL-LINE EXPORT-CHANNEL EXPANSION PROJECT

Name and Location

Coal-line export-channel expansion programme, South Africa.

Client

Transnet Freight Rail (TFR).

Project Description

TFR is in the process of expanding its coal export channel, which links the coalfields of Mpumalanga and the Waterberg, in Limpopo, to markets in Europe and Asia by increasing initial capacity on the corridor to 81-million tons a year and thereafter to 97.5-million tons a year. Tenders for a prefeasibility study to increase the capacity to 97.5-million tons a year will be issued in the near future to confirm the expansionary and sustaining investments.

The programme combines investments in new infrastructure and rolling stock, most notably a comprehensive dual-voltage locomotive acquisition programme.

The infrastructure construction programme for the expansion to 81-million tons a year has started. Major work packages include various sustaining investments and the upgrade of four yards at Blackhill, Saaiwater, Ermelo and Vryheid, 11 substations, five new substations and two locomotive workshops upgrades, with a new locomotive turntable.

The work packages will be executed through a combination of internal resources and external design and supply contracts.

TFR has also brought forward the engineering and design work on the Overvaal second tunnel, owing to the operational challenges and risk associated with the single-line tunnel between Ermelo and Richards Bay.

The tender documents for the feasibility studies are expected to go to market before the end of the 2014 financial year.

Value

Together with sustaining capital, the capital investment to increase capacity to 81-million tons a year is estimated at R31.6-billion over the next ten years.

Duration

The 81-million-ton-a-year coal line is expected to be completed in 2014/15 and the expansion to 97.5-million tons a year will span ten years, with various capacity tranches being delivered during this period.

Latest developments

TFR will introduce a new 200-wagon rail service along its coal export corridor, raising the operation's yearly capacity to above 81-million tons.

Dubbed 'Project Shongololo', the service will operate directly between the privately owned Richards Bay Coal Terminal (RBCT), in KwaZulu-Natal, and the coal mines of Mpumalanga, bypassing the Ermelo yard leg to reduce train-handling time. Previously, 100 empty wagons have been dispatched from Ermelo to the mines for loading before being returned to the yard for consolidation into 200-wagon trains.

TFR CEO **Siyabonga Gama** says the new approach, which is part of its scheduled-railway philosophy, will reduce cycle times for locomotives from an average of 58 to 41 hours and from 63 to 48 hours for wagons. In addition, it will relieve capacity across its coal logistics system.

TFR estimates that it is poised to deliver more than two-million tons of coal a week for domestic and export customers, raising its annualised coal-transport capacity to 96-million tons.

Shongololo project manager **Pragasen Pillay** says 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.

The service will free up slots that can be used to address other domestic demands such as coal for Eskom's Majuba power station. Coal from the Waterberg region will also benefit from 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.

Project Shongololo introduces a new efficient use of technologies, including the concurrent use of wire-distributed power and ac/dc traction.

However, TFR has stressed that any ramp-up to 81-million tons in the near term will depend on the availability of coal and the timeous completion of the Eskom backbone supporting the coal line.

During the 2013 financial year, the group transported 69.2-million tons of coal along the export channel, a lower-than-expected increase from the 67.7-million railed in 2012. Softer coal prices have reportedly dampened demand, while TFR has also experienced operational problems at the Overvaal tunnel.

Under the bigger Transnet group's R300-billion-plus market demand strategy, the plan is to increase the corridor's capacity to 97.5-million tons a year by 2020 – well above the RBCT's nominal nameplate capacity of 91-million tons.

Transnet is, thus, also investigating the prospect of building a new open-access coal terminal, which could be developed in phases alongside the miner-owned RBCT.

Key Contracts and Suppliers

Coal export channel expansion to 81-million tons (internal resource strategy).

Overvaal tunnel doubling – call for feasibility tenders in 2014/15.

Coal export channel expansion to 97.5-million tons – call for prefeasibility tenders in 2014/15.

On Budget and on Time?

Not stated.

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TRANSNET FREIGHT RAIL'S IRON-ORE EXPORT-CHANNEL EXPANSION PROJECT

Name and Location

Iron-ore export channel expansion, Northern Cape and Western Cape, South Africa.

Client

Transnet Freight Rail (TFR), Kumba Iron Ore and Assmang, a joint venture between African Rainbow Minerals and Assore and several emerging mining companies, such as Dlo and Sedibeng.

Project Description

The iron-ore line is the main export channel for iron-ore from the mines in the Northern Cape to the Port of Saldanha.

Rail capacity was increased to 60-million tons a year and port export capacity to 58.5-million tons a year over the quay wall, resulting in targeted export iron-ore volumes increasing to 59.5-million tons a year in 2014.

The execution of Transnet's Market Demand Strategy could result in the channel capacity eventually increasing to 82.5-million tons beyond the 2020 financial year, in line with industry demand.

Value

The expected escalated cost to increase capacity to 82.5-million tons a year on the iron-ore line is estimated at R19.3-billion.

Duration

Not stated.

Latest Developments

Phase 1 expansion to 60-million tons a year has been completed and the capacity is available. The project is currently in the close-out phase.

Phase 2, which is the planned capacity expansion to a possible maximum of 82.5-million tons a year, is currently in the prefeasibility stage and will progress to the feasibility stage during 2014.

The rail replacement programme has been executed as planned, with 302 km of track replaced. Infrastructure upgrades have also included the replacement of 51 243 sleepers and 67 km of ballast screening.

Rail stress management will continue and all thermite welds will be X-rayed for defects. Thermite welds older than eight years will be replaced as a precautionary measure.

Key Contracts and Suppliers

SHE Cape Environmental (environmental-impact assessment study); Concor Roads & Earthworks (earthworks, trackworks, overhead track equipment and drainage), Wilson Bayly Holmes-Ovcon (WBHO), Lennings Rail Services and Racec (primary contractors); DCD-Dorbyl's rolling stock division, or RSD (three-axle bogies); Infraset Railway Products (precast concrete sleepers); and Rocla, subcontracted by Concor (railway line pipes, culverts and signal boxes); Venus Railways Solutions, a subsidiary of Mitsui & Co (electric locomotives main contractor); Toshiba Corporation (electrical equipment and technical support for electric locomotives) and Union Carriage and Wagon, or UCW (manufacturing and assembling of electric locomotives).

On Budget and on Time?

Phase 2 has not started yet.

Contact Details for Project Information

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Picture by Chief Photographer Duane Davis

Water & Sanitation

To ensure that South Africa has enough water to run its mines and farms, and that communities have enough water, government has spent more than R8-billion on water resources and bulk water infrastructure in 2013/14. Currently, 29 large bulk water schemes are under construction, with several others being planned.

The Department of Water Affairs' De Hoop dam, part of the Olifants River Water Resources Development Project – Phase 2, in South Africa's Limpopo province, is in its final stage of completion, with the storage of water having

started. Meanwhile, a project management unit was appointed in 2013 to provide specialist technical, environmental, socioeconomic, financial and procurement professional services to assist the Lesotho Highlands Development Authority in the procurement, management and implementation of Phase 2 of the Lesotho Highlands Water Project – a collaboration between the governments of South Africa and Lesotho – to augment the delivery of water to South Africa and to develop a hydropower generation system.



LESOTHO HIGHLANDS WATER PROJECT PHASE 2

Name and Location

Lesotho Highlands Water Project (LHWP) – Phase 2, Lesotho to South Africa.

Client

The governments of South Africa and Lesotho. The Lesotho Highlands Water Commission, Lesotho Highlands Development Authority and the Trans-Caledon Tunnel Authority (TCTA) are the countries' respective implementing authorities.

Project Description

Phase 1 of the LHWP was officially completed in 2004.

Phase 2 of the LHWP will be implemented in terms of two distinct systems, namely a water delivery system to augment the delivery of water to South Africa and a hydropower generation system.

Polihali dam

The Polihali dam will be built downstream of the confluence of the Senqu and Khubelu rivers and will be a 163.5-m-high concrete-faced rockfill embankment dam wall. The crest length will be 915 m with a full supply level of 2 075 m above sea level. A 49.5-m-high saddle dam will also be constructed as well as a side channel spillway.

Polihali to Katse tunnel

The 38.2-km-long, 5-m-diameter Polihali to Katse dam tunnel will be constructed to transfer water from the Polihali reservoir to Katse dam. The tunnel is sized to convey a peak power generation flow of 35 m³/s. Water will be abstracted from the Polihali reservoir through two separate concrete bell-mouth intakes on the western side of the Polihali reservoir in the Khubelu river, three kilometres upstream of the confluence with the Senqu. Water will be transferred through the lower and upper intake

tunnels to the intake gate shaft. Both of these tunnels will be constructed by drill-and-blast methods and will be fully concrete lined. Hydraulic control will be effected by the valves in the intake structures. The Polihali intake gate shaft will only be used for maintenance and water quality control functions.

Advance infrastructure

Where possible, the existing infrastructure constructed in Phase 1 will be used. This includes access roads, power supply, telecommunication systems and camps.

The Polihali intake site will utilise the infrastructure required to construct the Polihali dam and the tunnel. This includes feeder roads and bridges around the reservoir to connect affected communities, power supply systems, construction camps and communications.

The facilities at Katse dam will be used for the Polihali to Katse tunnel construction. Housing for the consultants and construction management teams will be provided in the existing facilities. Improvements to the water and sewage treatment plants, clinic and lodge will be undertaken. A primary school will be built.

The existing camp for construction workers at Mphorosane will be refurbished to be used by the Polihali to Katse tunnel contractors. Improvements and expansions to the existing water and sewage treatment plants will be required. Other ancillary services will be constructed as determined during the design phase. A satellite police station and accommodation facilities will be built and manned by Lesotho.

The upgrading of the existing hospital facilities at the Mamahau mission will be investigated and implemented to serve as a jointly managed project hospital, if found to be feasible.

Other infrastructure

Other access roads, feeder roads, management and labour camps, telecommunication and construction power systems will be built in addition to those detailed.





Where possible, the existing infrastructure constructed in Phase 1 will be used. This includes access roads, power supply, telecommunication systems and camps.

Environmental measures

Environmental mitigation measures, including environmental flow matters and baseline studies, will be implemented. The full extent is being studied in detail for implementation.

Social development programmes

Social development programmes and mitigation measures, resettlement requirements, baseline studies and public relations and awareness campaigns will be implemented. The full extent is being studied in detail for implementation. This is currently under discussion and will soon be agreed to by the parties to impose the absolute minimum disruption to the affected households and communities.

These infrastructure developments may include medical clinics, feeder roads and bridges around the reservoir to connect affected communities and social development projects such as schools, churches and community halls.

Pumped-storage scheme

Phase 2 may also include a pumped-storage scheme, associated transmission lines and associated works by utilising the existing Katse reservoir as the lower reservoir and a new upper reservoir in the Kobong Valley. The implementation of the pumped-storage scheme is subject to a joint decision by the two governments, upon which both governments are still deliberating.

Value

The water aspect of the project is likely to cost about R12-billion.

Duration

Preparatory work – baseline studies etcetera – started in mid-2013 and the mobilisation of the project management unit started in August 2013.

Latest Developments

A project management unit was appointed in 2013 to provide specialist technical, environmental, socioeconomic, financial and procurement professional services to assist the Lesotho Highlands Development Authority in the procurement, management and implementation of Phase 2. Expressions of interest for the design of the dam, tunnel and advance infrastructure are expected to be issued within the first two quarters of 2014.

Request for proposals for the design of the afore-mentioned infrastructure works, in particular the Polihali dam and transfer tunnel, as well as advance infrastructure will be issued in the third and fourth quarters of 2014. Consultants will mobilise and start with tender design in the first quarter of 2015 and tender documents for construction are expected to be issued from the end of 2015 through 2016. Construction of major works is expected to start early in 2017. Prequalification of engineering firms and contractors will be required for large infrastructure projects.

On Budget and on Time?

Too early to state.

Key Contracts and Suppliers

C4/Seed joint venture (feasibility study), the TCTA (debt management and funding of the water-transfer portion of the project, as well as the operation and maintenance of the Delivery Tunnel North), Mops Civil (access road) and BKS (construction of measuring weir).

Contact Details for Project Information

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TCTA'S OLIFANTS RIVER WATER RESOURCES DEVELOPMENT PROJECT PHASE 2

Name and Location

Olifants River Water Resources Development Project Phase 2, Limpopo, South Africa.

Client

The Department of Water Affairs (DWA), represented by the Trans-Caledon Tunnel Authority (TCTA) for Phases 2B to 2G.

Project Description

The ORWRDP comprises two phases and several subphases:

Phase 1 involved the raising of the Flag Boshielo dam by five metres, which has been completed.

Phase 2 (Phases A to I) involves the development of additional water resource infrastructure in the middle part of the Olifants water management area.

Phase 2A entails the construction of the De Hoop dam, which will be a bulk storage facility to augment the current water supply around the Steelpoort and Olifants rivers, in Limpopo. Water will primarily be supplied to increasing mining activities around the Steelpoort area.

The De Hoop dam, which will be the thirteenth-largest in the country, is expected to have a 347-million-cubic-metre reservoir capacity.

This phase also includes the construction of a roller-compacted concrete (RCC) gravity dam on the Steelpoort river, en route from Stoffberg to Steelpoort, near the existing provincial road (the R555), of which a 20 km portion has been realigned. The dam wall is being built downstream from confluence of the Steelpoort and Klip rivers, the latter being a tributary joining from the eastern side.

Phases 2B to 2G will entail the construction of a bulk distribution system to be funded and implemented by the TCTA.

The ORWRDP-2 is consequently a multipurpose project, incorporating economic and social development objectives to cater for the water demands of commercial and social users.

The project will consist of more than 200 km of pipelines that will vary in diameter from 800 mm to 1 800 mm, several pumpstations and storage reservoirs.

Value

R4.5-billion.

Duration

The construction of the De Hoop dam started in July 2007 and was initially expected to be completed in April 2011; however, owing to the construction challenges, the dam will now be completed in the 2013/14 financial year.

The first construction contract of the bulk distribution system started in early 2012 and will be completed by the end of 2014.

Further phases will be packaged into future contracts, with the last contract likely to be completed as late as 2017.

Latest Developments

The DWA has reported that the De Hoop dam is in its final stage of completion, with the storage of water having started.

Work on the first pipeline, which connects water treatment works at Steelpoort for the De Hoop dam, has also started and is expected to be completed by September 2014.

The pipeline to Sekuruwe, in the Waterberg, and Pruissen, in the Capricorn areas, has also started this year.

Key Contracts and Suppliers

For Phase 2A, De Hoop, the key contractors are:

Main Road Contractor (realignment of the R555 road):

Hillary, Liviero & Eigenbau (HLE) joint venture [JV] (main contractor).

Main Civil Contractor (De Hoop dam): De Hoop Construction West and subcontractors B&E International and Qanza JV (supply of fine and course aggregate, crusher run and rip-rap); Limpopo RR & Construction (drilling and blasting); Regray Security (site security); SA Rock Drills (drilling and grouting of dam foundations); Drakensburg Technologies (supply of standard formwork); Formscaff (supply of special formwork); Allied Plant and Hire (erection of RCC conveyor system); SA French (erection of tower crane); NSI (commissioning and maintenance of batch plants); Twin Cities (supply of cement); Dura Pozz Bulk (supply of fly ash); BASF (supply of cement additives) and Steeleale Reinforcing (supply and fixing of reinforcement).

For TCTA, the status of key contracts is as follows:

The Aurecon Ndodana JV was awarded the design and supervision contract in 2009, following an open tender process. Basil Read was awarded the construction contract for Phase 2C and Phase 2H in February 2012.

On Budget and on Time?

Not stated.

Contact Details for Project Information

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TCTA, tel +27 12 683 1200, fax +27 12 683 1300 or email info@tcta.co.za.

HLE JV, **Ed Hillary**, tel +27 15 293 1221.

MINING PROJECTS

Coal

Diamonds

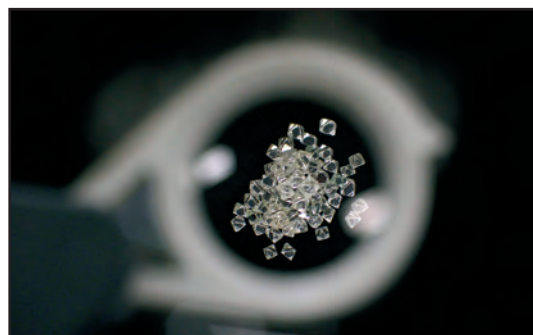
Gold

Iron-Ore

Other Mining Sectors

Platinum

Uranium



Coal

Coal is poised to be the second-biggest source of primary energy and the biggest source for electricity generation in the next 30 years, during which time South Africa's State-owned power utility Eskom will need four-billion additional tons of coal, in addition to what it has already burnt.

In fact, South African Coal Roadmap chairperson Ian Hall recently reiterated that new coal mines are urgently required and "just to keep the lights on". To this end, several companies are expanding or are developing new mines in South Africa.

In South Africa's Limpopo province, Coal of Africa Limited is embarking on the modification and expansion of its Vele colliery beneficiation plant and has also completed a definitive

feasibility study on its Makahado coking coal project in the province. The Waterberg Coal Joint Venture Partners has also completed and delivered a feasibility study on the development of a ten-million-tonne-a year opencast coal operation to prospective offtake partner Eskom. Resource Generation is also advancing the first phase of its Boikarabelo project in the province, while Exarro's Grooteegeluk Medupi expansion project, which is part of a 40-year supply agreement with Eskom, is in the final stages of commissioning.

In Mpumalanga, Wescoal is progressing the required environmental authorisations for its proposed Elandspruit multiproduct coal project and Sasol is building a new mine to replace output from its Middelbult coal mine, which is nearing the end of its useful life.



COAL OF AFRICA LIMITED'S VELE COLLIERY EXPANSION PROJECT

Name and Location

Vele colliery expansion project, Limpopo, South Africa.

Client

Coal of Africa Limited (CoAL).

Project Description

As at September 28, 2012, Vele had Joint Ore Reserves Committee-compliant resources of:

- 795.7-million gross tonnes *in situ* and 672.9-million mineable tonnes *in situ* of shallow-dip coal;
- 362.5-million tonnes, including 42.4-million tonnes of proven reserves and 325.6-million tonnes of probable reserves; and
- 42.4-million tonnes of run-of-mine (RoM) from the central and northern pits over a 16-year period, producing 16.5-million tonnes of saleable product.

The mine is currently configured as an opencast mine, but owing to the significant resource underground mining is a potential in the future.

The first phase of the project entailed the establishment of a modular coal treatment plant.

CoAL is embarking on the modification and expansion of its Vele colliery beneficiation plant, which will enable it to optimally produce three coal products (semisoft coking coal, thermal coal and sized coal) simultaneously at an expected processing capacity of 2.7-million tonnes a year of RoM. The planned three-month front-end engineering and design (Feed) process will enable CoAL to arrive at a class 1 – engineering, procurement and construction estimate.

The scope of work for the Feed contract includes:

- identifying and improving sections of the existing plant to ensure a 500 t/h throughput capacity;
- a stockpile management philosophy and associated design;
- a RoM handling, crushing and screening section;
- a destoning wash plant;
- a sized coal screening plant;
- a classifier in the fines beneficiation circuit;
- a froth flotation plant for the beneficiation of the ultrafines; and
- products and discard stockpiling and load-out facilities.

Value

The total capital expenditure to complete plant modification is estimated at R450-million and includes the necessary mine development and production ramp-up.

Duration

The expansion project will take place in the 2014 calendar year and expanded production will begin in 2015.

Latest Developments

CoAL's board has approved a R220-million plant expansion capital at Vele colliery. This is in line with the company's publicly announced strategy to reposition itself as a project development company focusing on its coking coal assets. This figure is included in the total amount of R450-million.

The approval follows the re-evaluation and confirmation of the quality of coal at Vele, and the conclusion of a review of the current operations. As

part of that process and for the colliery to reduce the current cash losses incurred, the colliery ceased production during October 2013 to prepare for the construction phase of the announced expansion.

The company has started the required fundraising activities, which should be finalised by the end of March.

Completion of the expansion is expected by the end of 2014. Thereafter, the colliery will begin to ramp up operations during 2015 and will be at full production by the end of that year.

A collaborative and inclusive engagement process with the contractor companies operating at the mine has been concluded, with 49 people retained, 138 employees redeployed to other operations and 155 employees retrenched. Throughout this process, the company has attempted to minimise job losses, while proactively engaging with all its stakeholders to minimise these impacts. This has resulted in the preservation of 55% of the jobs.

CoAL's commitment to recruit from its local labour-sending areas will be upheld once the construction phase starts in 2014.

Key Contracts and Suppliers

Sedgman South Africa (Feed).

On Budget and on Time?

Not started.

Contact Details for Project Information

CoAL head of engineering, **Nico Pretorius**, email nico.pretorius@coalofafrica.com; or investor relations and business development manager **Celeste Harris**, email celeste.harris@coalofafrica.com.

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COAL OF AFRICA LIMITED'S MAKHADO COKING COAL PROJECT

Name and Location

Makhado coking coal project, Limpopo, South Africa.

Client

Coal of Africa Limited (CoAL).

Project Description

The Makhado project is CoAL's anchor project in the Soutpansberg coalfield, in Limpopo, where the company has access to a significant hard coking and thermal coal resource, with the gross tonnes *in situ* estimated at eight-billion tonnes.

A definitive feasibility study has defined a 16-year life-of-mine, with mining expected to take place at an average rate of 12.6-million tonnes a year of run-of-mine to produce 2.3-million tonnes a year of hard coking coal and 3.2-million tonnes a year of thermal coal at a steady state.

The resource will be mined on an opencast basis, with potential underground expansion.

The project has been divided into three mining areas for technical, logistical and practical reasons – East pit, Central pit and West pit.

Mining will be staggered, starting with the East pit, followed by the Central and West pits. The development of the East pit will include plant and infrastructure components, which will cater for the production volumes from the other pits.

The processing plant will comprise:

- a double-stage dense-medium separation plant for the destoning and beneficiation of the hard coking coal and the thermal product, achieved

through a high-gravity wash and followed by a low-gravity wash for the coarse-size fraction of $-50+1\text{mm}$;

- a fines ($-1+0.15\text{mm}$) circuit, encompassing a low-gravity reflux classifier process for the production of the coking coal and a high-gravity reflux classifier for the production of the thermal product; and
- an ultrafines (-0.15mm) circuit of Jameson column flotation cells for the production of the coking coal and a potential thermal product.

Value

Capital expenditure is pegged at R3.96-billion, including contingency.

Duration

Not stated.

Latest Developments

CoAL continues to engage the relevant government departments in relation to its new-order mining right and integrated water use licence applications for the Makhado coking coal project, and is working towards finalising the black economic-empowerment aspects required prior to the granting of the mining right for the project.

Key Contracts and Suppliers

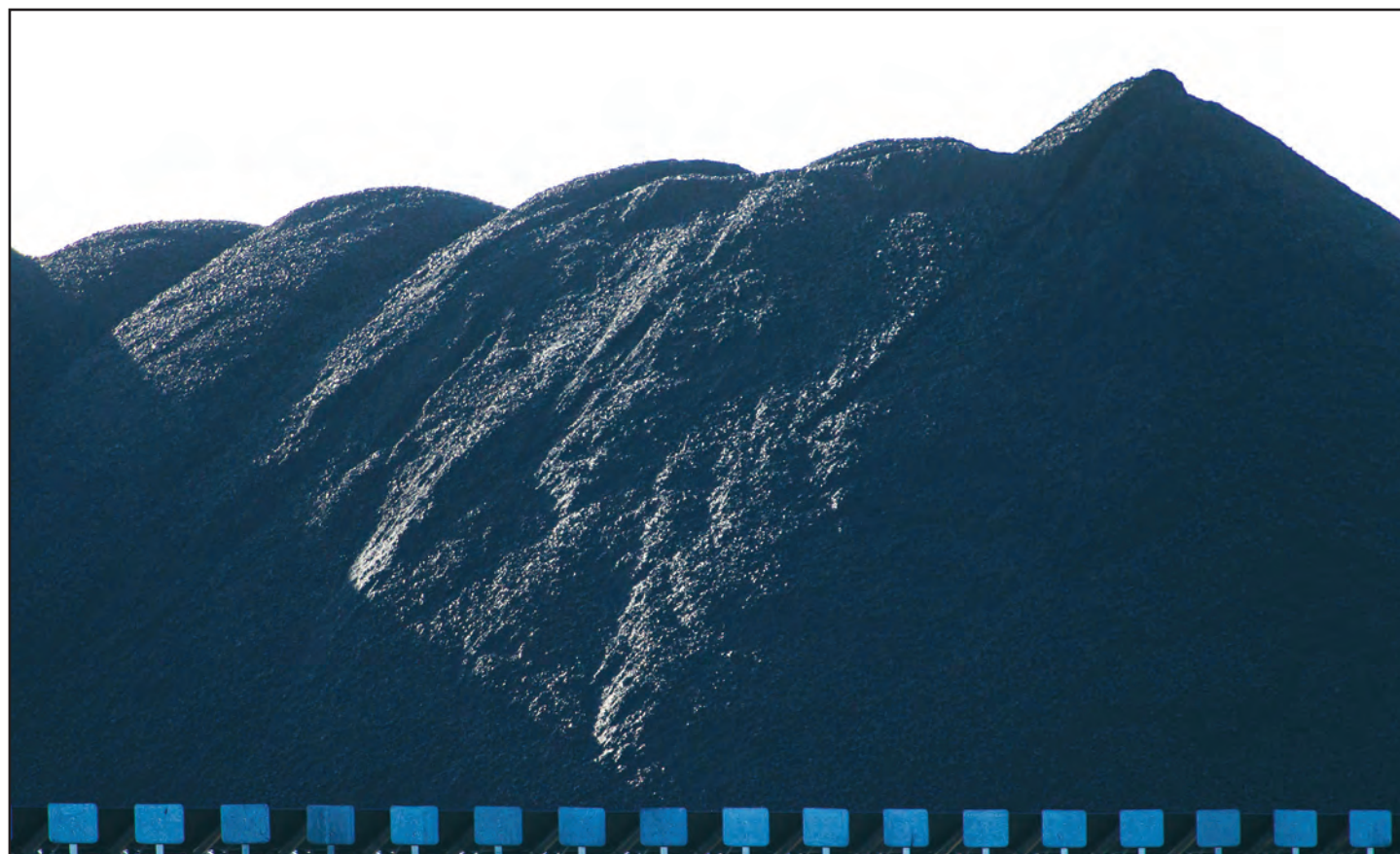
Too early to state.

On Budget and on Time?

Too early to state.

Contact Details for Project Information

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EXXARO RESOURCES' GROOTEDELUK MEDUPI EXPANSION PROJECT

Name and Location

Grootegeeluk Medupi expansion project (GMEP), Limpopo, South Africa.

Client

Exxaro Resources.

Project Description

The project entails a brownfield expansion of Exxaro's Grootegeeluk mine. Coal will be mined from the existing opencast pit at an accelerated rate, with the mine's current production increasing from 19-million sales tonnes a year to 34-million sales tonnes a year.

The brownfield expansion requires new developments in mining processes, screening, beneficiation and the stockyard. The project will use new technology to deliver high-quality product. These will include semimobile crushers and tippers, dry screening of the material smaller than 6 mm, large-coal dense-medium separator (DMS), or larcodem units, and large cyclones.

The expansion will be mined with semimobile in-pit tip-and-crusher units supplied by the truck and loading operations. The tipping bins and crushers will be used as mobile units in the pit and will move as the mine moves forward.

Two new DMS facilities, the Grootegeeluk 7 and Grootegeeluk 8 beneficiation plants, which will be constructed at the mine, will handle the coal beneficiation process.

The run-of-mine (RoM) coal will be screened through the coarse-coal screens to remove material smaller than 40 mm. Material smaller than 6 mm will be screened out dry for direct mixing into the final product, which eliminates the need for slimes dams.

Material bigger than 40 mm and smaller than 100 mm will be beneficiated in the larcodems, while material smaller than 40 mm will be beneficiated in the large cyclones.

The fines in the process water will be recovered in the thickener dams and dried in the filter presses to be mixed into the final product. When water gets into contact with the coal, it will not be allowed into the environment. Polluted water will be kept in the loop circulation process for reuse.

The stockyard will accommodate about 430 000 t of coal, which will be stacked and reclaimed with two stackers and one reclaimer respectively. The RoM stockpiles will be introduced between the mine, the plant and the discard stackers to support continuous production.

About 740 housing units are being built to cater for the project team and the expanded workforce.

The expansion is part of the 40-year coal supply agreement, at an average of 14.6-million tonnes a year, that Exxaro secured with Eskom to supply the utility's new Medupi power station, which is under construction near Lephalale, in Limpopo.

Value

It is expected that the total project expenditure will be about R10.2-billion. The revised budget has increased by R700-million, owing to a combination of factors, including additional escalations, labour unrest, steel shortages and additional scope that has been added to the project.

Duration

Coal supply ramp-up will continue until the second half of 2016.

Latest Developments

Construction on the GMEP to supply Eskom's Medupi power station with 14.6-million tonnes a year of coal is now 97% complete.

The coal supply ramp-up began in 2013, with 1.3-million tonnes produced and 0.9-million tonnes dispatched to Matimba power station after industrial action affected the mine's production in the first quarter of 2013. Further ramp-up and performance testing will be done in the first half of 2014 as per the revised contractual arrangement.

GMEP's outstanding mining equipment that was delayed on the back of the revised ramp-up schedule agreed between Exxaro and Eskom is provided for in Phase 3. Total project expenditure to date is R9.3-billion with total capital expenditure forecast at R10.2 billion, including GMEP's portion of the houses and backfill project.

The backfill project has progressed well, with Phase 1 completed in 2013. It is expected to be operational in the first quarter of 2014. Phase 2 is planned to be completed by the end of 2017.

Key Contracts and Suppliers

LSL Consulting, SSG Consulting and Engineering & Projects Company, or E+PC (design); Arup (civils); Melco (conveyor equipment supplier); Consolidated Power Projects (overhead power lines and transformers); M Projects (building upfront infrastructure); Concor Holdings (bulk earthworks plant area, blending and load out); PRG Electrical Engineering & Services (construction power); MMD Mineral Sizing (Africa) (in-pit crushing system); Basil Read (in-plant workshop); Makeshift (relocation of piping and civil services); FLSmidth (stackers and reclaimers); Stefanutti Stocks Civils (RoM area civil); Aveng Engineering & Projects Company (coal-washing plant); Wade Walker (electrical and instrumentation work); SMEI Projects (assisting SCMEI Projects – plant area civils, thickeners civils, plant area structural, mechanical, platework and piping [SMPP], mining area bulk earthworks, buildings administration, blending and load-out civil, 11 kV distribution, low-voltage and instrumentation plant area, blending and load-out SMPP, filter plant SMPP and RoM area SMPP) and Amrec (planning and scheduling).

On Budget and on Time?

The construction of the GMEP continues to progress as planned and within budget.

Contact Details for Project Information

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RESOURCE GENERATION'S BOIKARABELO COAL PROJECT

Name and Location

Boikarabelo coal project, Limpopo, South Africa.

Client

Resource Generation (Resgen).

Project Description

Boikarabelo has probable reserves of 745-million tonnes, a measured resource of 1.1-billion tonnes, an indicated resource of 551.7-million tonnes and an inferred resource of 1.5-billion tonnes.

The Boikarabelo coal seam is between 20 m and 30 m below surface, enabling low-cost, opencut mining. The seam is between 120 m and 130 m thick, with zones of varying quality thermal and soft coking coal.

The mine will be developed using a two-phased approach to limit upfront capital expenditure.

The first phase will deliver about 14-million tonnes of run-of-mine coal a year, which will equate to about six-million tonnes of product coal. Of this, three-million tonnes will be exported and three-million tons will be used domestically.

Phase 2, planned for 2020, will involve ramping up production to 20-million tonnes of product coal.

The project includes a 40 km rail link to the existing rail network.

Boikarabelo hosts a life-of-mine of up to 100 years.

Value

The estimated capital cost for the project has been reduced to \$480-million, reflecting reduced costs of the coal handling and preparation plant.

Duration

Resgen's black economic-empowerment subsidiary, Ledjadja Coal, received the Boikarabelo mining rights from the Department of Mineral Resources in April 2011.

Initial construction of the mine started in the first quarter of 2013 and is scheduled for completion by the end of 2015.

The mine is expected to begin production in the last quarter of 2015.

Latest Developments

Resgen has taken a major step in progressing its Boikarabelo coal mine by agreeing to terms for the design and supply of a coal handling and preparation plant (CHPP).

The \$200-million CHPP will be the largest capital item for the Boikarabelo project and the company is completing the final drawings for the plant.

The cost for the CHPP is about \$50-million less than earlier estimates.

Resgen is in discussions with Danish export credit agency EKF regarding a guarantee to cover more than 50% of the CHPP cost.

The EKF guarantee, if confirmed, is expected to facilitate the raising project finance for the CHPP.

Key Contracts and Suppliers

Digby Wells Environmental (mining right application, mine-waste licence, environmental authorisation process for power plant), RSV Enco (engineering, procurement and construction management for mine construction), FLSmidth (coal handling and preparation plant) and RCE (rail design and construction).

On Budget and on Time?

First production has been delayed to the last quarter of 2015.

Detailed mining and engineering plans, together with the results of tenders, have reduced the estimated first-stage cost of the mine to \$480-million.

Contact Details for Project Information

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RCE, tel +27 12 450 0040 or fax +27 12 450 0060.

SASOL'S SHONDONI COAL PROJECT

Name and Location

Shondoni coal project, Mpumalanga, South Africa.

Client

Sasol Mining.

Project Description

The project will result in the construction of a new mine to replace output from Sasol's mature Middelbult coal mine, which is nearing the end of its useful life. The project is one of three replacement projects being undertaken by Sasol.

The extractable reserves at Shondoni are estimated at about 190-million tons, which translates into an operating life of 20 years.

The mine will deliver 10.5-million tons a year of streaming coal when in full production and will include surface infrastructure, as well as an 18 km overland conveyor system.

The move to develop the mine forms part of what Sasol has previously described as an "intense capital replacement" programme involving three significant projects, namely Shondoni, Thubelisha and Impumelelo.

Value

R5.6-billion installed contract value.

Duration

The project is scheduled for completion in the second half of 2015.

Latest Developments

None stated.

Key Contracts and Suppliers

ProMet Dadi Africa (feasibility study); WorleyParsons (engineering, procurement and construction) and Sandvik Mining (materials handling systems).

On Budget and on Time?

Not stated.

Contact Details for Project Information

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WorleyParsons (Secunda), tel +27 17 631 3447 or fax +27 17 631 3648.

Sandvik Mining Systems head of mining systems **Manfred Schaffer**, tel +43 316 902 62 65 10.



WATERBERG COAL JOINT VENTURE COAL PROJECT

Name and Location

Waterberg coal joint venture (JV) coal project, Limpopo, South Africa.

Client

Waterberg Coal Joint Venture Partners (WCJVP), comprising Firestone Energy and Sekoko Resources.

In October 2013, ASX-listed Waterberg Coal Company (WCC) acquired 45.88%, or 1.63-billion shares, of dual-listed Firestone Energy, resulting in WCC acquiring 32.36% of the coal producer. WWC also acquired 480-million Firestone shares from its 25%-owned subsidiary Sekoko Resources, separately from the takeover offer, representing a further 13.52% interest in Firestone.

Project Description

The project consists of eight farms, in the Waterberg coalfield, totalling 7 979 ha. The identified area over the Smitspan farm (first phase base case) indicates a mine layout covering 507 ha, extending for 3.5 km from east to west and for 1.8 km from north to south.

The project proposes the development of an opencast mining operation to produce ten-million tonnes a year of coal for Eskom for an initial term of 30 years, pursuant to the memorandum of understanding (MoU) that the JV entered into with Eskom in March 2012.

Value

Not stated.

Duration

Not stated.

Latest Developments

The WCJVP have delivered a feasibility study on the development of a ten-million-tonne-a-year opencast coal operation, in Limpopo, to prospective offtake partner Eskom.

This follows the cementing of an MoU between the Waterberg JV and Eskom for a proposed coal supply agreement (CSA), which will result in the envisaged mining operation delivering product to the coal-dependent parastatal for an initial 30-year term.

The coal project boasts 3.88-billion tonnes of coal of which, 2.07-billion tonnes are classified under the measured category.

While the details of the feasibility study remain confidential, ASX-listed WCC director **Stephen Miller** says the JV partners are updating the study, which will be released as a full bankable feasibility study on completion.

Eskom has taken delivery of a 200 000 t bulk sample product to conduct a burn test to determine the project's coal quality.

At Eskom's request, the feasibility study has factored in the construction of a conventional coal-density separation beneficiation plant capable of beneficiating up to 23.5-million tonnes of raw run-of-mine coal and designed to achieve a raw coal feed rate of 22-million tonnes a year, with plant use of 6 600 hours a year.

"Based on the latest mine schedule requirements, at peak production, four coal preparation modules are required, each rated at 825 t/h," says Miller. This will include high-gravity separation using dense-media cyclones.

The plant will also consist of spirals for coal beneficiation, a filter plant to dewater thickener underflow and a water clarification and reticulation system.

Ultrafine coal will be dewatered in a tailings thickener, while small and fine coal will be dewatered using vibrating basket centrifuges.

Meanwhile, discussions between the WCJVP and Eskom regarding the terms of the CSA are well advanced.

The WCJVP have also entered into a letter of intent with Ardbel – a JV between ELB Engineering Services and DRA Group – as the preferred engineering, procurement and construction contractor on the project.

Key Contracts and Suppliers

SRK Consulting (feasibility study) and Coffey Mining (geotechnical investigation).

On Budget and on Time?

Not stated.

Contact Details for Project Information

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SRK Consulting, tel +27 11 441 1111, fax +27 11 880 8086 or email johannesburg@srk.co.za.

Coffey Mining, tel +27 11 679 3331, fax +27 11 679 3272 or email Coffey.Africa@coffey.com.

WESCOAL'S ELANDSPRUIT COAL PROJECT

Name and Location

Elandspruit multiproduct coal project, Mpumalanga, South Africa.

Client

Wescoal.

Project Description

The Elandspruit mining right contains five potentially mineable coal seams, which occur from suboutcrop to a maximum depth of about 70 m below surface.

A Phase 1 desktop planning study completed on the resource has indicated that production of about two-million tonnes a year is targetable over a 15-year mine life, at an average strip ratio of 2.3:1.0 (bank cubic metres waste:tonnes coal) for the combined seams.

Mine scheduling simulations also indicate that the grade of as-mined coal should be relatively consistent over the life-of-mine (LoM), with raw qualities averaging 21.14 MJ/kg calorific value, 30.0% ash, 21.5% volatile matter and 1.08% sulphur content on an air-dried, uncontaminated basis.

The desktop study findings suggest that the most attractive option, from several alternative production scenarios, envisaged the marketing of partially processed coal from the No 1 and No 2 lower seams as an Eskom-type product, with raw coal from the No 3 Seam and washed coal from the No 2 Upper and No 4 Lower Seams sold to the export/inland markets. Further work is required to test the feasibility of this scenario.

Laboratory exercises indicated that processing all mined coal for a 26 MJ/kg product could achieve an average theoretical yield of 50%.

A range of processing alternatives, designed to deliver various sales options to the export, inland and Eskom markets, are being assessed by Wescoal. These may involve toll-treating the run-of-mine coal off site or upgrading the coal through a dedicated on-site facility.

At this stage of project evaluation, no coal reserves have been declared, as further work is required to develop a final LoM plan, which is required by the South African Mineral Resource Committee code.

Value

Not stated.

Duration

Not stated.

Latest Developments

Wescoal is progressing the required environmental authorisations in terms of the National Environmental Management Act, the National Water Act, the National Environmental Management: Waste Act and the National Heritage Resources Act and has started negotiations with surface right owners.

These processes are expected to be completed during the first half of 2014, following which the commissioning of the Elandspruit mine will start, with production expected to attain 200 000 t/m by the last quarter of 2014.

Key Contracts and Suppliers

None stated.

On Budget and on Time?

Not stated.

Contact Details for Project Information

Wescoal, tel +27 11 954 2721 or fax +27 86 688 2009.





Diamonds

The diamond industry has been on a rollercoaster ride since the global financial crisis of 2008. Prices plummeted in that year and in 2009, which resulted in rough diamond producers reacting to falling prices by reducing planned output. Diamond prices have since stabilised; however, production at many of the world's major diamond mines is declining, compared with previously high levels of output. Some of these mines are expected to come to the end of their useful lives within the next decade.

While some new mines are scheduled to come on stream in the coming years, none are as significant in size to make up for the loss of production from the current mines and there have been no major new discoveries since the early 1990s. Profitable, major kimberlites are,

therefore, difficult to find and can take anything from 10 to 15 years from discovery to bring into production. Therefore, many diamond miners are investing in and optimising their assets to extend the life span of their operations.

At De Beers Consolidated Mines South Africa's Venetia mine, in Limpopo, plans are afoot to build a new underground mine beneath the current operating openpit. The new underground mine will extend the life of the mine to 2040 and replace the openpit as South Africa's largest diamond mine.

In Botswana, a purpose-designed modular tailings treatment project is being built at Debswana's Jwaneng mine. The project is expected to add 900 000 ct/y to the mine's current output.

DE BEERS' VENETIA DIAMOND MINE EXPANSION

Name and Location

Venetia underground project (VUP), Limpopo, South Africa.

Client

De Beers Consolidated Mines South Africa (DBCM).

Project Description

The Venetia mine, which officially opened on August 14, 1992, is currently the largest producer of diamonds in South Africa and accounts for about 40% of the country's total yearly diamond production.

The mine is currently an openpit operation; however, work started in late 2013 to build a new underground mining operation beneath the current operating openpit.

The new underground mine will extend the life of Venetia to beyond 2040 and replace the openpit production from 2021 as South Africa's largest diamond mine. During the construction period between now and 2021, employment will peak at about 4 000. After 2021, the underground operation will support 6 626 jobs of which 1 482 will be in the mine and 5 143 elsewhere supporting mining activity.

Value

De Beers expects to invest about R20-billion in the Venetia underground mine from now to 2021, when the conversion from openpit to underground is expected to begin.

Duration

Underground operations will begin production in 2021.

Latest Developments

Construction of the Venetia underground mine was launched by President **Jacob Zuma** on October 22, 2013. The first sod was turned on the terrace where two vertical shafts and a decline shaft will be sunk to a depth of one kilometre to extend the life of South Africa's biggest and most lucrative diamond mine.

Sixty kilometres of tunnelling will have to be constructed before the underground operation can start production, using massive mining techniques to produce 5.9-million tonnes a year of ore and providing employment for about 1 800 people for the next 22 years.

Key Contracts and Suppliers

Murray & Roberts Cementation, Basil Read Civils, Conco, Sandvik and Barloworld.

On Budget and on Time?

Too early to state.

Contact Details for Project Information

DBCM, email info@debeersgroup.com.

Murray & Roberts Cementation, tel +27 11 201 5000, fax +27 11 201 5500 or email info.cementation@murrob.com.

Basil Read Civils, tel +27 11 418 6300 or fax +27 11 418 6333.

Conco, tel +27 11 805 4281, fax +27 11 805 1132 or email conco@conco.co.za.

Sandvik, tel +27 11 929 5300.

Barloworld, tel +27 11 445 1000 or fax +27 11 444 3643.



DEBSWANA'S JWANENG MODULAR TAILINGS TREATMENT PROJECT

Name and Location

Jwaneng modular tailings treatment project (MTTP), Botswana.

Client

Debswana.

Project Description

A purpose-designed MTTP is being built at the Jwaneng mine.

A substantial volume of diamond tailings had been accumulating at the mine since operations began in 1983, before the mine's recrush facilities were introduced.

The MTTP will treat 2.4-million tons of old tailings a year and is expected to yield 18-million carats over 20 years.

This will add 900 000 ct/y to Jwaneng's current output of 13-million tons, increasing it to 14-million carats a year.

The plant will serve as a pilot facility with the potential for deployment to other Debswana mines.

Value

The estimated capital cost of the project is \$93.75-million.

Duration

Mechanical completion of the plant is expected in July and ramp-up in August 2014.

Latest Developments

Construction of the plant is at an advanced stage, with completion expected by the end of June this year.

Commissioning will start in July with final handover expected in August.

Key Contracts and Suppliers

ADP Projects (engineering and procurement partner); Kalcon (main contractor on civils) and SMEI (main contractor on mechanical/structural and electrical and instrumentation).

Financing and operations are conducted solely by Debswana.

On Budget and on Time?

The project is currently forecast to be completed a month behind the original schedule date, owing to the liquidation of the main steel supplier.

Contact Details for Project Information

ADP Projects, tel +27 21 521 9400 or fax +27 21 521 9401.

Debswana, tel + 267 361 4200 or fax + 267 318 0778.

Kalcon, tel +267 390 9202 or fax +267 397 2821.

SMEI, tel +27 11 914 4101, fax +27 11 914 4108 or email smei@smei.co.za.





Gold

Gold meets the criteria of being, at least historically the most sought-after metal. Its attributes, including malleability, resistance to corrosion and tarnishing, and its shimmer makes it ideal for many jewellery purposes. There is more to gold, however, and that is the opportunity that the metal provides for investors, although 2013 proved to be an unlucky year for the yellow metal as its price dropped 28% – the worst slump in more than 30 years. The price decline added to the troubles of the industry, which was already struggling with rising costs, labour issues, strikes, delays and/or the cancellation of projects.

Many gold miners have suspended projects, curtailed their capital spending and resorted to layoffs to conserve cash, and are vigorously pursuing opportunities to optimise their portfolio, including the divestiture of certain noncore or nonproductive assets. One such company is Gold Fields, which has unbundled from its labour-intensive narrow-reef mines.

The fully mechanised South Deep gold mine, in Gauteng, is the only remaining South African asset the company operates, which remains largely in project mode and continues its build-up to full commercial levels of production.

Meanwhile, Witwatersrand Consolidated Gold Resources' final feasibility study on its De Bron-Merriespruit project, in the southern Free State goldfield, has been delayed to accommodate the implementation of the acquisition of Southgold Exploration, which owns the Burnstone gold mine.

Elsewhere in Africa, Randgold Resources is strongly positioned to deal with the downturn in the gold price, with the company's business model designed to deliver returns at lower gold prices. Its Kibali gold project, in the Democratic Republic of Congo, poured its first gold in September 2013 and produced and sold 88 200 oz of gold in its first quarter of operation.

GOLD FIELDS' SOUTH DEEP GOLD MINE EXPANSION

Name and Location

South Deep gold mine expansion, Gauteng, South Africa.

Client

Gold Fields.

Project Description

South Deep is a fully mechanised underground mine, extracting a wide multiple band reef at depths between of 2 500 m and 3 000 m below surface. The extraction of such deep-level, wide reefs have not been totally mechanised elsewhere in the world. The production methods used at the mine are, therefore, unique and differ markedly from the labour-intensive mining method traditionally applied in underground mines in South Africa.

The project comprises a main shaft and a ventilation shaft – collectively referred to as the Twin Shaft complex, which will have a combined hoisting capacity of 370 000 t/m of ore.

The main shaft was completed in 2004 and comprises a single drop to a depth of 2 995 m.

The ventilation shaft has been deepened from 2 760 m to about 2 950 m and is fully equipped with ore-storage silos and conveyor belts at shaft bottom, a new rock winder and new headgear.

The mine's headgear at the vent shaft was completed in 2011 using one of the largest fabricated steel headgear frames in the world.

The South Deep metallurgical plant, which was commissioned in November 2012, has also been expanded and has increased processing capacity from 220 000 t/m to 330 000 t/m.

From 2010 to 2012, the mine completed the construction of the centralised tailings storage facility, developed and installed infrastructure around the shaft systems and also changed to full plant tailings backfill for increased production levels. The backfill plant was commissioned in early 2012.

The South Shaft complex will add an additional 120 000 t/m of hoisting capacity to the mine, bringing the total combined hoisting capacity to 450 000 t/m.

The South Deep operation had a resource of 79-million ounces as at December 31, 2012, and a reserve of 39-million ascertained ounces, which would give the operation a life-of-mine of more than 50 years.

Value

Capital expenditure decreased from R2.56-billion in 2012 to R1.96-billion in 2013, in line with increased focus on capital optimisation and scheduling. Most of the expenditure was spent on development, the maintenance of critical infrastructure and equipment, trackless equipment and the full plant tailings backfill.

Duration

South Deep's production build-up is expected to reach a run rate of between 300 000 and 330 000 reef tonnes a month by the end of 2017.

Latest Developments

South Deep is still largely in project mode and continues its build-up to full commercial levels of production.

South Deep is continuing the process of right-sizing the cost-base in line with the mine's production profile. The aim is to create a more cost-effective and fit-for-purpose structure by reducing senior management levels, replacing contractors with its own employees, where practical, and optimising all support-service costs without



Picture by Chris Photographs Duane Davis

impeding the trackless mechanised mining and ancillary engineering capabilities critical to the momentum of the build-up.

The comprehensive project review, announced in August 2013, has been concluded and, based on the progress made to date and a reassessment of the key inputs into the future mine production schedule, a revised production build-up schedule has been determined. The South Deep production build-up is expected to reach a run rate by the end of 2017, producing between 650 000 oz and 700 000 oz of gold on an annualised basis at an all-in cost of about \$900/oz, assuming an exchange rate of \$1.00/R9.50 in present-day money terms.

Critical factors that are being addressed to underpin the build-up include:

- ore handling infrastructure – Phase 1 of the silo system was completed in 2013, with Phase 2 planned to be completed in 2014;
- fleet availability and utilisation; and
- operator and technician skills.

A new mechanised centre was opened in early 2013 and has world-class equipment to ensure employees are trained to operate at the highest levels possible in the mechanised mining environment. It can accommodate 60 people a day and has four lecture rooms.

Meanwhile, during 2013, South Deep continued its positive build-up trajectory, with gold production improving by 12% from 270 000 oz in 2012 to 302 100 oz in 2013, and the mission critical destress mining increasing by 24% to 53 700 m² in 2013, which is double the run-rate of two years ago. These improvements are in line with the guidance provided for 2013.

In the quarter ended December 31, 2013, total tonnes milled decreased by 5% from 609 000 t to 578 000 t, owing to the continuing focus on cleaning the long-hole stopes. This and seismicity resulted in reduced drifting and development metres and associated reef tonnes.

Underground reef yield increased by 8% from 4.96 g/t to 5.38 g/t, owing to the cleaning of the high-grade 95 2W and 95 3W long-hole stopes, partially offset by a lower grade in the 95 1W long-hole stopes.

Development decreased by 24% from 2 988 m in the September quarter of 2013 to 2 263 m in the December quarter of the same year, mainly owing to the transitional arrangements, with respect to moving from contractor development to owner development. The new mine capital development

in Phase 1, sub 95 level, decreased from 610 m to 228 m. Vertical development decreased from 132 m to 122 m. Development in the current mine areas above 95 level decreased from 2 246 m to 1 912 m. Development areas in 95 2W and above 95 level were negatively affected by seismicity during the December quarter.

Destress mining decreased by 3% from 14 986 m² in the September quarter to 14 504 m² in the December quarter.

Key Contracts and Suppliers

Redpath (backfill piping, battrice panel installation and the replacement of South Shaft steelwork); Newrack (secondary support); WorleyParsons (metallurgical plant design); AEL Mining Services (supply of explosives for blasting) Atlas Copco and Sandvik (suppliers of HME and spares).

Previous contractors and suppliers:

Murray & Roberts Cementation (mine development and shaft deepening); Wilson Bayley Holmes-Ovcon (WBHO) and Wade Walker (tailings dam); MM&G (steelwork fabrication); Steel Services and Allied Industries, Hatch and Cadhouse Design Enterprises (ventilation shaft headgear); Howden Africa (commissioning of main surface ventilation fans); and Sarens South Africa and Crane Corporation (overhead crane for the ventilation shaft headgear).

On Budget and on Time?

The project is on budget but, the roll-out to steady-state production of 650 000 oz to 700 000 oz has been postponed by a year to the end of 2017.

Contact Details for Project Information

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AEL Mining Services, tel +27 11 606 0000.

Atlas Copco, tel +27 11 821 9000.

Sandvik, tel +27 11 929 5300.

Previous contractors and suppliers:

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MM&G, tel +27 11 914 4740.

Wade Walker, tel +27 11 466 0377.

WBHO, tel +27 11 321 7200, fax +27 11 887 4364 or email wbho@wbho.co.za.

Steel Services and Allied Industries, tel +27 18 787 2059 or fax +27 18 787 3416.

Hatch, tel +27 11 239 5300 or fax +27 11 239 5790.

Cadhouse Design Enterprises, tel +27 16 429 1643 or email info@cadhouse.co.za.

Howden Africa, tel +27 11 240 4000, fax +27 11 493 0545 or email enquiries@howden.co.za.

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Picture by Chief Photographer Duane Davis

RANDGOLD RESOURCES' KIBALI GOLD PROJECT

Name and Location

Kibali gold mine, Orientale province, Democratic Republic of Congo (DRC).

Client

The Kibali joint venture comprises Randgold Resources (45%), AngloGold Ashanti (45%) and DRC State-owned mining company Société des Mines d'Or de Kilo-Moto (10%). Randgold is the developer and operator of the mine.

Project Description

The Kibali operation will comprise an integrated underground and openpit mine; a twin-circuit sulphide and oxide plant, with a throughput of six-million tonnes a year; four self-constructed hydropower stations; and a standby high-speed thermal power generator for backup during the dry season.

The mine was constructed over two overlapping phases.

Phase 1 covered the metallurgical plant, the first phase of the tailings storage facility, the construction of a hydropower station, a backup thermal power plant, construction of the tailings storage facility, openpit mining, all shared infrastructure and the completion of the community resettlement programme.

Phase 2 involves the development of the underground mine, including a twin decline and single-shaft vertical system, and three hydropower stations.

The current life-of-mine plan envisages an average yearly output of about 600 000 oz for the first 12 years, with an average grade of 4.1 g/t and 12-million ounces in reserves.

Value

Kibali represents an initial investment of \$1.77-billion by Randgold and AngloGold Ashanti.

Duration

Phase 1 ran from the first quarter of 2012 to the first quarter of 2014.

Phase 2 is expected to deliver first ore in 2014 and to complete the vertical shaft sinking in 2016.

Latest Developments

Kibali is a work in progress, with shaft sinking under way at the project's underground mine.

Further, the first of four hydropower stations is expected to be commissioned soon and the remaining sulphide circuit is scheduled for completion at the end of the first quarter of 2014.

Nevertheless, the project poured its first gold in September 2013 and produced and sold 88 200 oz of gold in its first quarter of operation, exceeding previous guidance. Gold production of 550 000 oz is forecast for the current year.

The mine made a net profit in its first quarter of production.

Key Contracts and Suppliers

Byrnegut (underground development); Shaft Sinkers (vertical shaft development); DTP (openpit mining) and DRA (metallurgical facility design and engineering, procurement and construction management).

On Budget and on Time?

Kibali was successfully commissioned ahead of schedule and on budget on September 24, 2013, with gold sales starting the following month.

Contact Details for Project Information

Randgold Resources, tel +44 20 7557 7738 or email randgold@dpapr.com.



WITWATERSRAND CONSOLIDATED GOLD RESOURCES' DE BRON-MERRIESPRUIT GOLD PROJECT

Name and Location

De Bron-Merriespruit (DBM) gold project, Free State, South Africa.

Client

JSE- and TSX-listed Witwatersrand Consolidated Gold Resources (Wits Gold). On December 11, 2013, it was announced that an offer to acquire the entire shareholding in Wits Gold had been made by JSE- and NYSE-listed Sibanye Gold. The transaction is expected to be finalised by the end of March, subject to certain approvals and conditions being satisfied, after which Wits Gold will become a wholly owned subsidiary of Sibanye.

Project Description

The DBM project area comprises a triangular block measuring 22 km² and is located between the main Welkom goldfield to the north and the Beatrix and Joel gold mines to the south, which are operated by Sibanye Gold and Harmony respectively.

Within the project area, four gold-bearing conglomerates are developed. These consist of the Beatrix, Kalkoenkrans, B and Leader reefs, all of which occur at the relatively shallow depths of between 480 m and 1 250 m below surface.

The results of a prefeasibility study (PFS) on the project, released in June 2012, delineated a probable gold reserve of 23.5-million tonnes at a grade of 4.1 g/t gold (3.1-million ounces), which is contained within that portion of the resource at DBM that occurs at depths shallower than 1 000 m (the orebody starts at a depth of 480 m), and which contains an indicated mineral resource of 26.7-million tonnes at 5.8 g/t gold (4.99-million ounces).

According to the PFS, DBM will be a shallow underground mine, comprising a planned twin-shaft system to 660 m, with average gold production expected to be 200 000 oz/y over an 18-year life-of-mine. Production is expected to peak at 246 777 oz at 5.5 g/t during year nine and first gold production is expected 47 months after shaft sinking has begun.

Value

Peak capital funding is estimated at R2.37-billion.

Duration

Mine production is targeted for 2018.

Latest Developments

Following the completion of the PFS on time and within budget, Royal HaskoningDHV (formerly Turgis Consulting) and MDM Engineering were appointed in August 2012 to complete the final feasibility study at the DBM project.

Royal HaskoningDHV is responsible for the detailed engineering and mine designs, while MDM Engineering will focus on the metallurgical plant and related design aspects.

The detailed study was expected to be completed during the fourth quarter of 2013; however, this has been delayed to accommodate the implementation of the acquisition of Southgold Exploration, which owns the Burnstone gold mine, and is only expected to be released during the first quarter of 2014. However, pending the successful completion of the acquisition by Sibanye, certain synergies between the DBM project

and the adjacent operations of Sibanye could be investigated to enhance the economics of mining the DBM project and other advanced projects held by Wits Gold.

The feasibility study will further refine certain aspects identified in the PFS that will aim to improve mining efficiencies by introducing safer, semimechanised mining equipment and down-dip mining methodologies.

The PFS, using the economic parameters at the time, showed that the semimechanised option increased the internal rate of return to 30.9% and the pretax net present value to R10.2-billion (5%).

In addition, further upside exists by the study investigating the inclusion, through additional drilling, of the existing shallow inferred resources of 5.97-million tonnes at 5.7 g/t of gold that is readily mineable from the current mine design.

Key Contracts and Suppliers

Geosearch and Turnstone Drilling (drilling contractors); SGS Laboratories (assay analysis); GCS (environmental-impact assessment and related studies); Royal HaskoningDHV, completed the scoping study and PFS at the DBM project (detailed engineering and mine designs) and MDM Engineering (metallurgical plant and related design aspects).

On Budget and on Time?

The PFS was completed on budget and on time. The submission of the bankable feasibility study was postponed from the fourth quarter of last year to the first quarter of this year, and will also depend on the successful acquisition by Sibanye.

Contact Details for Project Information

Wits Gold corporate affairs executive **Hethen Hira**, tel +27 11 832 1749, fax +27 11 838 3208 or email hethenh@witsgold.com.

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Geosearch, tel +27 11 397 3880, fax +27 11 397 6011 or email mail@geosearchgroup.com.

Turnstone Drilling, tel +27 18 771 2226 or fax +27 18 771 2114.

SGS Laboratories, tel +27 11 680 3466 or fax +27 11 433 3654.

GCS, tel +2711 803 5726, fax +27 11 803 5745 or email info@gcs-sa.biz.

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Iron-Ore

Global demand for iron-ore, a key component of steel, largely depends on the state of the steel industry worldwide and, more specifically, on the state of the steel-manufacturing sector in China – the world's largest steel-consuming nation.

In 2013, China's continued heavy spending on subways, bridges and other infrastructure kept demand for iron-ore high. This trend is expected to continue, albeit at a slightly less bullish pace, with steel demand in China expected to grow by as much as 4.5% this year, after growing 7% last year. In spite of the forecasted dip in steel demand in China, several companies are

continuing to invest in new projects that will increase the supply of available iron-ore. For example, Aquila Resources is considering the development of a four-million-ton-a-year direct shipping ore operation in South Africa's Limpopo province, while Ferrex continues to develop the initial 1.8-million-tonne-a-year Malelane iron-ore project, in Mpumalanga.

Meanwhile, Iron Mineral Beneficiation Services' iron-from-fines prototype project, in Limpopo, started commissioning in October 2013 to convert iron-ore fines into metallic briquettes for use as a scrap metal supplement in electric steelmaking.

Source: Bloomberg

AQUILA RESOURCES' THABAZIMBI IRON-ORE PROJECT

Name and Location

Thabazimbi iron-ore project, Limpopo, South Africa.

Client

Aquila Resources.

Project Description

The Thabazimbi project and Meletse iron-ore deposit have a total Joint Ore Reserves Committee-compliant iron-ore resource of 80.8-million tons, grading 61.1% iron.

With these resources, the project could support a four-million-ton-a-year direct shipping ore operation for domestic and/or international sales.

It is expected that the resource will have the capacity to produce at least 60% of the product as high-grade lump ore.

Value

Not stated.

Duration

Not stated.

Latest Developments

In the quarter ended December 31, 2013, the environmental scoping report for Thabazimbi was submitted to the Department of Mineral Resources.

Further Aquila reports that approval was received from the Limpopo Province Department of Economic Development, Environment and Tourism to proceed with the environmental scoping and environmental-impact assessment phases.

In addition, the project's volume requirements have been included in Transnet's study scope for the planned Waterberg heavy haul line.

Geological mapping and rock chip sampling continued at the Randstephanie South prospect, about 1 km south-west of the Meletse iron-ore deposit, with assays received ranging up to 67% iron from iron-ore outcrops extending over a 600 m strike.

A new iron-ore outcrop has been mapped at Randstephanie North, about 500 m west of the Meletse deposit, with assays pending and geological mapping in progress.

Key Contracts and Suppliers

None stated.

On Budget and on Time?

Not stated.

Contact Details for Project Information

Aquila Resources,
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fax +618 9423 0133 or email
mail@aquilaresources.com.au.

FERREX'S MALELANE IRON-ORE PROJECT

Name and Location

Malelane iron-ore project, Mpumalanga, South Africa.

Client

Ferrex.

Project Description

The project is located over part of the Archaean Barberton greenstone belt and covers 4 192 ha.

Three distinct banded iron formation (BIF) horizons have been identified on the property, with a combined strike length of 14 km and mapped horizontal widths of up to 300 m.

The project has a Joint Ore Reserves Committee-compliant inferred resource of 139-million tonnes at 37% iron, which is modelled on only 1.1 km of the 14 km BIF strike, and the project has an upgraded total exploration target of 1.6-billion tonnes to 2-billion tonnes at 28% to 30% iron, as announced in June 2013.

Envisaged is an initial 1.8-million-tonne operation at 57% iron, with a life-of-mine of 16.6 years and a conventional openpit mine with a strip ratio of 1.55:1.

Value

The project has an estimated capital expenditure (capex) of \$139-million.

Duration

Not stated.

Latest Developments

The prospecting right for the Malelane iron-ore project has been extended to May 20, 2016.

The extension of the prospecting right is in line with Ferrex's strategy to continue to develop the project as a low capex, initial 1.8-million-tonne-a-year operation with a mine life of 16.6 years.

Ferrex MD **Dave Reeves** says the extension of the prospecting right is a significant step in Malelane's development, as it will ensure sufficient time for the prefeasibility and bankable feasibility studies to be completed as the project advances towards production.

Key Contracts and Suppliers

Turgis Consulting (scoping study); Prime Resources (environmental plans) and Leyanda Group (social and labour plan).

On Budget and on Time?

Too early to state.

Contact Details for Project Information

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Leyanda Group, tel +27 11 684 1267, fax +27 11 684 1201 or email
info@leyandagroup.com.

IRON MINERAL BENEFICIATION SERVICES' IRON-FROM-WASTE PROTOTYPE PROJECT

Name and Location

Iron-from-fines prototype project, Limpopo, South Africa.

Client

Iron Mineral Beneficiation Services (IMBS), which includes Jonah Capital (40%) and OAO Severstal of Russia (33%), is in partnership with South Africa's State-owned Industrial Development Corporation and is receiving strong support from the Limpopo government.

Project Description

The project involves the construction of a 50 000 t/y demonstration facility in Phalaborwa to convert iron-ore fines into metallic briquettes for use as a scrap supplement in electric steelmaking.

The facility will use IMBS's patented technology. To produce the cold-briquetted metallic iron the technology has been licensed to International Iron Beneficiation Group (IIBG), which will deploy it worldwide and pay royalties to IMBS, which will operate the iron-making plants with IIBG, an OAO Severstal subsidiary.

The technology enables the conversion of previously stockpiled fine and ultrafine iron-ore material into a saleable product.

The next stage of the project at Palabora Mining Company is the construction of two 500 000 t/y capacity plants.

Value

The demonstration project will involve an investment of R120-million and could be the precursor to a larger R800-million project to produce 500 000 t/y of the briquettes.

Duration

The plant's first briquettes were produced during the first quarter of 2014.

Latest Developments

The plant started commissioning in October 2013 and the key process gas generation and recovery system is operating successfully. The first briquettes have been pressed.

Key Contracts and Suppliers

None stated.

On Budget and on Time?

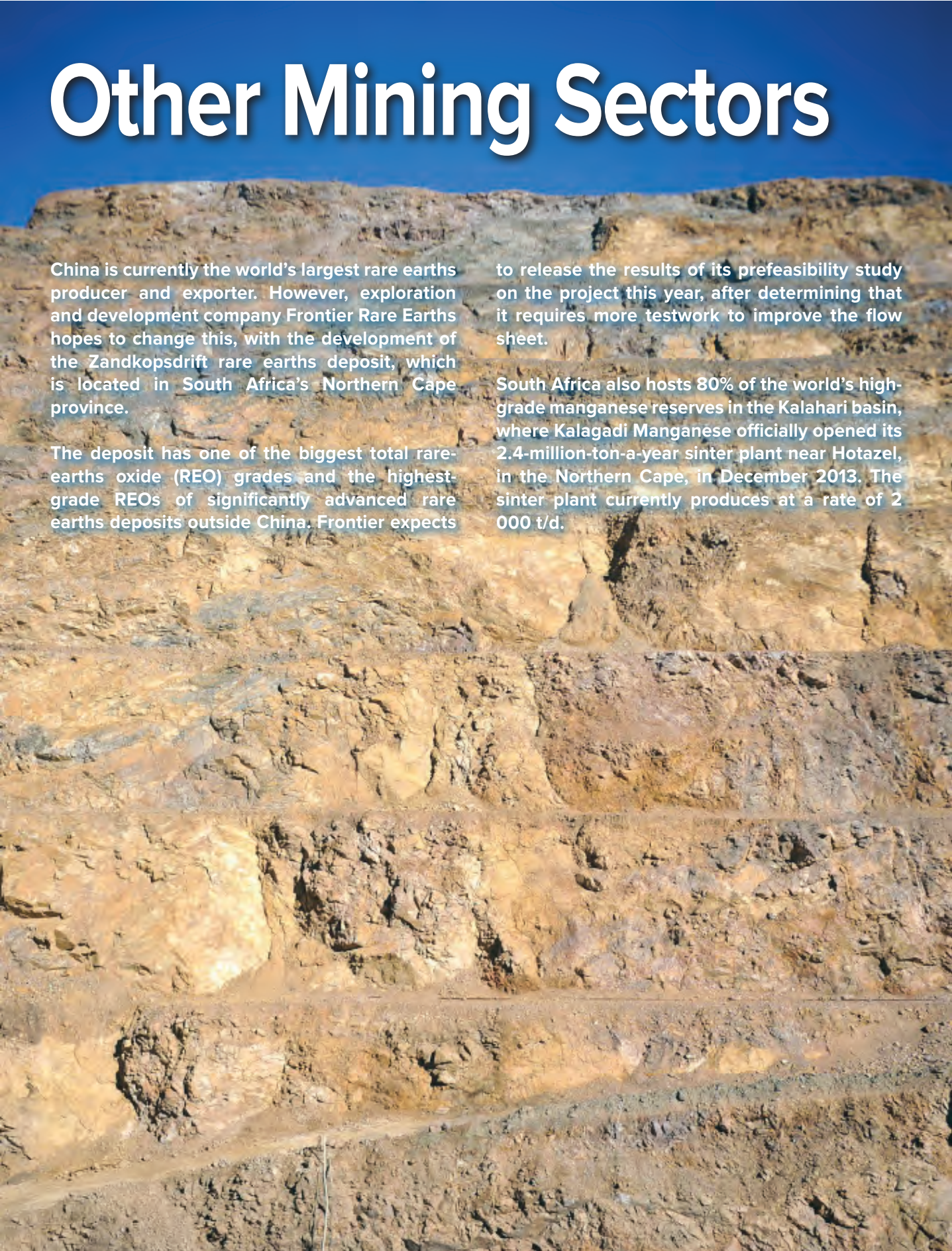
Not stated.

Contact Details for Project Information

IMBS, tel +27 11 996 4920, fax +27 11 658 1286 or email jenny@imbsworld.com.



Other Mining Sectors



China is currently the world's largest rare earths producer and exporter. However, exploration and development company Frontier Rare Earths hopes to change this, with the development of the Zandkopsdrift rare earths deposit, which is located in South Africa's Northern Cape province.

The deposit has one of the biggest total rare-earths oxide (REO) grades and the highest-grade REOs of significantly advanced rare earths deposits outside China. Frontier expects

to release the results of its prefeasibility study on the project this year, after determining that it requires more testwork to improve the flow sheet.

South Africa also hosts 80% of the world's high-grade manganese reserves in the Kalahari basin, where Kalagadi Manganese officially opened its 2.4-million-ton-a-year sinter plant near Hotazel, in the Northern Cape, in December 2013. The sinter plant currently produces at a rate of 2 000 t/d.

Other Mining Sectors

FRONTIER RARE EARTHS AND KOREA RESOURCES' ZANDKOPSDRIFT RARE-EARTH ELEMENTS PROJECT

Name and Location

Zandkopsdrift rare-earth elements project, Northern Cape, South Africa.

Client

Frontier Rare Earths and Korea Resources Corporation (Kores).

Project Description

Zandkopsdrift has one of the biggest total rare-earth oxide (REO) grades and the highest-grade REOs of significantly advanced rare earths deposits outside China.

Envisioned is a standalone opencast mine, which will be mined by conventional free-dig and/or drill, blast and haul techniques, with minimal drilling and blasting required. The steady-state mining production target is one-million tons a year and the total separated REOs target production rate is 20 000 t/y.

Infrastructure associated with the mine and process plant includes the upgrade of existing district roads from the surrounding towns to the mine.

The water supply to the mine will be provided by Frontier from demineralised water, piped 35 km from a desalination plant.

Turbogenerators will supply power using the on-site exothermic reactions within an on-site sulphuric acid production plant.

The desalination plant will be powered by diesel generators and the Saldanha separation plant will be supplied by State-owned power utility Eskom.

Value

\$910-million, which includes capital expenditure requirements for the Zandkopsdrift mine, related infrastructure and services, land purchases, mine closure and rehabilitation provision, the upgrading of local district roads, the provision of the social and labour plan, as well as the Saldanha separation plant, with its related infrastructure and services.

Duration

Along with its strategic partner, Kores, Frontier intends to start rare earths production in 2016, with a target production capacity of 20 000 t/y of separated REOs.

Latest Developments

Frontier Rare Earths expects to release the results of its prefeasibility study (PFS) this year, after determining that it requires more testwork to improve the flow sheet.

Capital and operating costs of the mine, processing plant and related infrastructure are expected to be higher than the initial economic assessment in 2012, but will be partially offset by lower capital and operating costs for the rare earths separation plant.

The completed PFS was presented to the company for review during the third quarter of 2013. It identified several areas where engineering-design and process improvements could be made that were expected to have a "potentially significant" positive impact on the estimated capital and operating costs of the Zandkopsdrift processing plant and the Saldanha separation plant.

Value engineering and process optimisation studies are currently under way. Other areas of improvement are also being investigated.

The company has also said that while it is initially planned that any process improvements recommended by the feasibility study testwork will be

introduced during the feasibility study, it has decided that the positive impact is potentially big enough that it should be included in the PFS.

The proposed process improvements include a flow sheet that is expected to result in a higher proportion of higher-value critical rare earths and higher-purity products being produced through another rare-earth element recovery method and a new processing technology.

This will, in turn, lead to a basket price for Zandkopsdrift production at current free-on-board China prices of \$44/kg, compared with an *in situ* basket price of \$36/kg.

Key Contracts and Suppliers

Venmyn SNC-Lavalin (preliminary economic assessment); Mintek and SGS Mineral Services (metallurgical flow sheet development); the MSA group (resource estimation); Sound Mining Solutions (mine design and schedule); Epoch Resources (design of tailings disposal facility); SNC Lavalin (separation plant engineering design and capital operating cost estimates) and DRA (engineering design and operating cost estimates for Zandkopsdrift).

On Budget and on Time?

Project is on schedule.

Contact Details for Project Information

Frontier Rare Earths (Luxembourg), tel +352 208 80249 or email ir@frontierrareearths.com.

Other Mining Sectors

KALAGADI MANGANESE PROJECT

Name and Location

Kalagadi Manganese project, Northern Cape and Eastern Cape, South Africa.

Client

Kalagadi Manganese is held by ArcelorMittal South Africa (50%), Kalahari Resources (40%) and the Industrial Development Corporation (10%).

Project Description

The project involved the construction of a manganese mine and a 2.4-million-ton-a-year high-grade sinter plant (Umtu sinter plant), near Hotazel, in the Kuruman area of the Northern Cape.

The output required to produce this amount of sinter will be three-million tons a year.

An additional component of the project is the construction of a 320 000 t/y high carbon ferromanganese smelter complex, in the industrial development zone (IDZ) of the Coega deep-water harbour, in the Eastern Cape.

The plant will be designed to produce silicomanganese as an alternative product.

The smelter will be situated in Zone 6 of the IDZ metallurgical zone and provision will be made to expand the facility to as much as double the original production of 320 000 t/y of high carbon ferromanganese.

The project area overlies the Kalahari basin, which is estimated to contain 80% of the world's known high-grade manganese resources.

An evaluation of historically available information indicates that up to 960-million tons of mineable resources could exist under the 8 000 ha prospecting area.

Value

R11-billion, which will be funded by 40% equity and 60% debt.

Duration

The mine, sinter and associated infrastructure project is expected to be completed by the end of 2014.

Latest Developments

Kalagadi Manganese has secured a R2.2-billion loan from the African Development Bank (AfDB) for its mine, sinter plant and part of the proposed smelter complex.

The 11-year loan, with an undisclosed interest rate, has a two-year grace period.

Developmental funding institutions like the AfDB give longer loan tenure at favourable terms, which facilitates development.

The sinter plant, which was hot commissioned on January 6, is currently producing at a rate of up to 2 000 t/d.

Funding is also being secured for the unfunded portion of the smelter, which is to be built in the Coega IDZ at the deep-water Ngqura port, near Port Elizabeth.

The smelter is designed to yield 320 000 t/y of high-carbon ferromanganese and, of the 2.4-million tons of sinter expected to be produced a year, 700 000 t is earmarked for the smelter and the rest will be exported.

Kalagadi is finalising a product offtake agreement with the JSE-listed Metmar.

Key Contracts and Suppliers

Camden Geoserve (geological consultant); MDM Engineering (bankable feasibility study, front-end engineering and design; engineering and

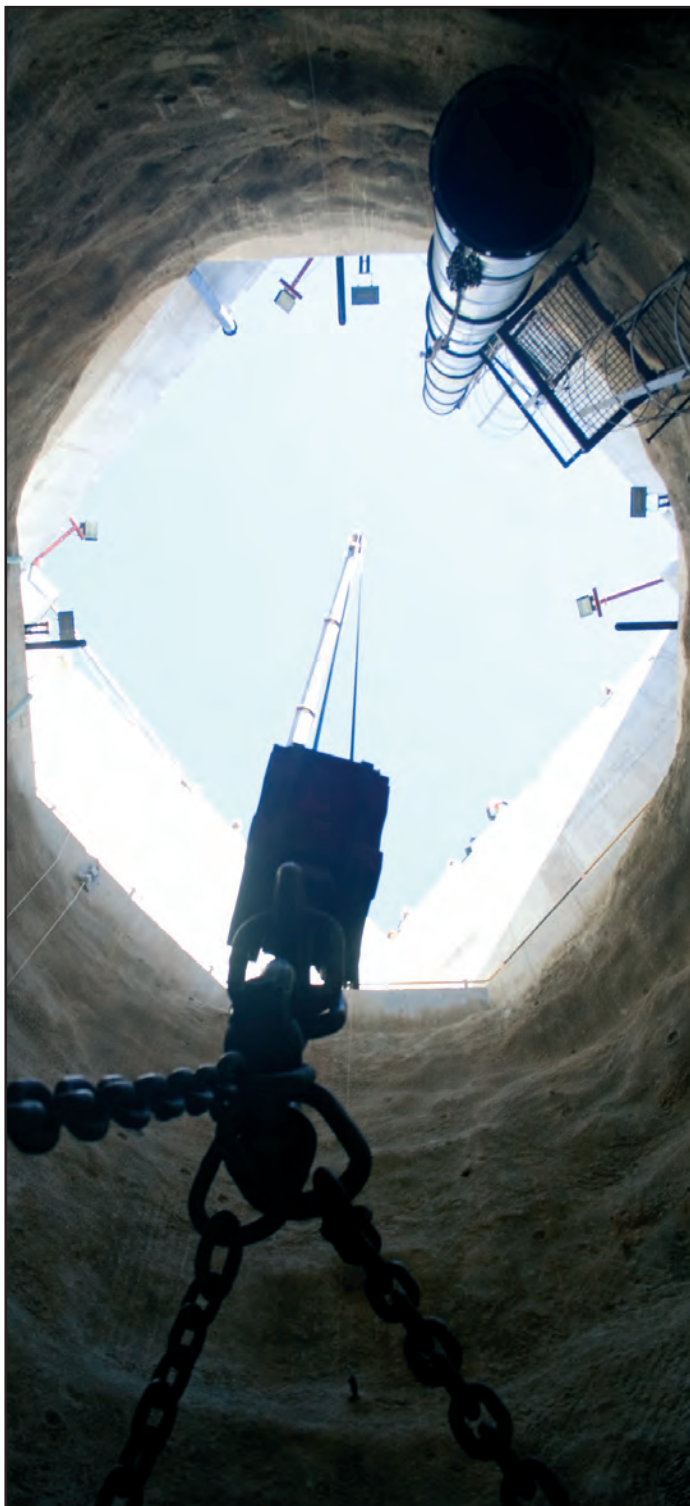
construction management); Group Five (civils and building contractor); Grinaker-LTA (shaft sinking and rail); Tubular (main and ventilation shaft headgears) and Outotec (sinter plant).

On Budget and on Time?

The project is on track and is expected to be commissioned by July.

Contact Details for Project Information

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Picture by Chief Photographer Duane Davis

Platinum

South Africa's platinum sector is facing a mixture of market, operational and societal challenges that could potentially threaten the future viability of the industry. The country's platinum production has decreased markedly since 2012 and no sizeable increase is expected from South African producers over the next three to five years, with production decreasing even further, should current market conditions persist.

Nonetheless, South Africa, China and Europe are expected to drive platinum supply and demand fundamentals in 2014, despite the precious metal grappling with the effects of declining

gold prices, according to platinum specialist Johnson Matthey.

Several platinum projects are under development in South Africa. These include Impala Platinum's 17 Shaft project, in the North West; Ivanhoe Mines' proposed Platreef platinum group metals nickel/copper/gold project, in Limpopo; Royal Bafokeng Platinum and Anglo American Platinum's Bafokeng Rasimone Platinum North Shaft Merensky Phase 3 and Styldrift 1 expansion project, as well as Wesizwe Platinum's Bakubung platinum group metals project, all in the North West.



Source: Wesizwe Platinum

IMPALA PLATINUM'S NO 17 SHAFT PROJECT

Name and Location

Impala No 17 Shaft project, Rustenburg, North West, South Africa.

Client

Impala Platinum (Implats).

Project Description

The No 17 Shaft project is a tonnage-replacement project for the Impala Rustenburg operations and is located down dip of No 10 Shaft. The shaft complex is designed to produce 225 000 t/m (2.7-million tonnes a year) of reef from eight operational levels. The shaft will access the Merensky and upper group two reef horizons.

The entire mine design is conventional, with horizontal crosscuts to reef on 32 half levels.

The shaft complex comprises three vertical concrete-lined shafts, namely a rock and men-and-materials shaft (10 –m-lined diameter), a dedicated down cast chilled air (fridge) shaft (6-m-lined diameter) and an up cast ventilation shaft (9-m-lined diameter). A total 1 300 kg/s of chilled air will be down cast through the rock and men-and-materials shaft, and the fridge shaft, to cool and ventilate the underground workings.

A Koepe winder will hoist the rock to surface before ore is transported to the plant by rail, while a second Koepe winder will transport men and materials. The shaft will produce 180 000 platinum ounces a year at steady state.

Value

R11.1 billion.

Duration

Full production of 180 000 oz/y of platinum is expected to be reached in 2023.

Latest Developments

Sinking at the No 17 Shaft complex remains on target, with the sinking of the refrigeration and ventilation shafts completed to the ultimate planned depths of 1 438 m and 1 764 m below surface respectively. The construction of the ventilation shaft loading facility is in progress.

The main shaft is currently at a depth of 1 824 m below surface, and sinking and station development activities are under way. The development of the first two production-level stations (21 and 22 levels) and the raiseboring of ore passes have started.

Key Contracts and Suppliers

WorleyParsons (engineering, procurement and construction management); Scribante (earthworks); Murray & Roberts, or M&R (civils); Shaft Sinkers (ventilation, main and refrigeration shafts); Louwill Engineering (building structures); NIC Electrical & Instrumentation Construction (construction and instrumentation); Grinaker-LTA (shaft headgear erection contract); DRA Technical Services, ABB, Siemag Tecberg, Coilmec, Actom, Siemens and Winder Controls (supply of winders for the project); BBE Projects (turnkey design, construction and commissioning of the refrigeration plant and air cooler system) and Johnson Controls, subcontracted by BBE Projects (supply of chiller system).

On Budget and on Time?

No 17 Shaft was slowed down in the 2013 financial year as a result of cash preservation measures. Production build-up is planned to start in 2018, about two years later than previously envisaged, with full production expected to be reached in 2023.

Contact Details for Project Information

Impala No 17 Shaft project manager **Jacey Kruger**, cell +27 82 801 1232.

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Johnson Controls Systems & Services public relations manager **Nanda Aerts**, tel +32 2 709 4481 or email Nanda.Aerts@jci.com.

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WorleyParsons, tel +27 11 218 3000 or fax +27 11 218 3100.

IVANHOE MINES' PLATREEF PLATINUM GROUP METALS/NICKEL/COPPER/GOLD PROJECT

Name and Location

Platreef platinum group metals/copper/nickel/gold project, Limpopo, South Africa.

Client

Ivanhoe Mines.

Project Description

The Platreef project involves the construction of a mechanised underground mine to access the underground 'Flatreef' discovery at Ivanhoe's Platreef project, on the northern limb of the Bushveld Igneous Complex, in Mokopane, Limpopo. The company is sinking a bulk-sample shaft to obtain mineralised bulk samples for further studies.

The Flatreef mineral resource, with a strike length of 6 km, predominantly lies within a flat to gently-dipping portion of the Platreef mineralised belt at relatively shallow depths of about 700 m to 1 100 m below surface.

As of March 2013, Flatreef's National Instrument 43-101-compliant, indicated mineral resources was 214-million tonnes, grading 4.1 g/t platinum, palladium, gold and rhodium (4PE), 0.34% nickel and 0.17% copper at a 2.0 g/t 4PE cutoff grade, containing an estimated 28.5-million ounces of 4PE, 1.61-billion pounds of nickel and 794-million pounds of copper.

Shaft 1, with an internal diameter of 7.25 m, will initially extend to about 800 m below the surface and facilitate the collection of a mineralised bulk sample in the latter half of 2015 to complete the company's development assessment of the Flatreef deposit.

This will further assist the mine planning work and complement the understanding of the deposit. This understanding has been developed since 2002 using the results of 1 134 exploration drill holes.

About 250 contract employees will be working on the shaft once the sinking work begins.

Value

Shaft 1 is expected to cost an estimated \$80-million and will be fully funded by a Japanese consortium's 10% interest in the Platreef project, acquired in two tranches in 2011 for a total investment of \$290-million.

Duration

Ivanhoe received approval in September 2013 from the Department of Mineral Resources (DMR) to proceed with the bulk-sample shaft. Terrace and shaft-collar designs have been completed and issued for construction. Contractor mobilisation and site preparation works started in November 2013.

Latest Developments

Together with the Japanese investment consortium, Ivanhoe Mines is working on a scoping study, based on a mining operation of up to 12-million tonnes a year, with multiple shafts and access points. The study is expected to be completed in early 2014.

DRA Mineral Projects, of South Africa, in consultation with Stantec, SRK, Geotail, Golder Associates and Digby Wells, is continuing with the prefeasibility study (PFS) planned for completion in the second quarter of 2014.

Ivanhoe filed a mining right application with the DMR in June 2013.

Key Contracts and Suppliers

Aveng Mining (primary sinking contractor) and DRA Mineral Projects, in consultation with Stantec, SRK, Geotail, Golder Associates and Digby Wells (PFS).

On Budget and on Time?

The Platreef project is on target for initial underground development in 2018 and concentrator start up in the fourth quarter of 2019.

Contact Details for Project Information

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Ivanhoe Mines, VP and project director **Gerick Mouton**, tel +27 11 088 4300 or email gerickm@ivanplats.com.

ROYAL BAFOKENG PLATINUM AND ANGLO AMERICAN PLATINUM'S BRPM NORTH SHAFT MERENSKY PHASE 3 PROJECT

Name and Location

Bafokeng Rasimone Platinum Mine (BRPM) North shaft Merensky Phase 3 project, North West, South Africa.

Client

BRPM Joint Venture (JV), comprising Royal Bafokeng Platinum (RBPlat) and Anglo American Platinum (Amplats).

Project Description

The BRPM Phase 3 project is providing further replacement for Merensky production at the North shaft complex through the extension of the existing decline from level 10 to level 15 at the mine boundary.

At steady state, Phase 3 will maintain the production level of North shaft at about 100 000 t/m.

Value

R1.409-billion.

Duration

The project started in November 2010 and is scheduled for completion in the third quarter of 2017.

Latest Developments

The Phase 3 project was 57% complete at the end of 2013, compared with a forecasted completion of 52%.

The cumulative project expenditure at year-end was R585-million, with a R40-million declared saving to date. The project has a current estimated saving on completion of R100-million against the approved project budget of R1.409-billion.

Key Contracts and Suppliers

None stated.

On Budget and on Time?

The project is forecasted to be completed four months ahead of schedule, with an estimated saving of R100-million.

Contact Details for Project Information

RBPlat communications manager **Kea Kalebe**, tel +27 14 573 1487, fax +27 86 219 5131 or email kkalebe@bafokengplatinum.co.za.

Amplats corporate communications, **Mpumi Sithole**, tel +27 11 373 6246, fax +27 11 373 5846 or email Mpumi.sithole@angloamerican.com.



Source: Royal Bafokeng Platinum

ROYAL BAFOKENG PLATINUM AND ANGLO PLATINUM'S STYLDRIFT 1 EXPANSION PROJECT

Name and Location

Styldrift 1 expansion project, North West, South Africa.

Client

Royal Bafokeng Platinum (67%) (RBPlat) and Anglo American Platinum (33%) (Amplats).

Project Description

The project will exploit one of the last major Merensky mining blocks on the Western Bushveld.

Styldrift 1 will deliver an underground operation, which will be accessed through a twin vertical shaft system, with the main shaft being sunk to 758 m and the services shaft to 723 m.

The configuration of the main shaft will allow for a single-deck personnel-and-material cage compartment that can transport 185 people; a cage counterweight compartment; two Merensky reef skip compartments, each designed to accommodate a 22 t skip; and two future two skip compartments, each accommodating a 13 t skip.

The services shaft will comprise a personnel-and-equipment cage compartment, with the capacity to transport 22 people, and a cage counterweight compartment.

Four winders will be used during the project construction phase and three during the production phase. The height of the main shaft headgear is 58.6 m and the service shaft 41.3 m.

Concentrator capacity will be 2.76-million tonnes a year.

Initially, production will be conducted using wide-reef trackless mining methods and later through a combination of wide reef trackless mining and narrow-reef conventional mining methods.

The mine will process 230 000 t/m of Merensky reef and 20 000 t/m of waste at steady state.

Value

The miner reduced the budgeted capital expenditure for the Styldrift 1 project from R11.4-billion to R11.01-billion in November 2013. R2.5-billion has been funded to date.

Duration

Production ramp-up is expected to start in July 2015 and steady state – at 230 000 t/m – in July 2018.

Latest Developments

During 2013, RBPlat made steady progress with the Styldrift 1 project. Overall project progress at year-end was 39.2 %, compared with a planned progress of 37.5%, which is a gain of 1.7%.

Sinking of the main and services shafts progressed to 708 level (shaft loading level) and a total of 2 304 m of lateral development was completed, as well as 235 m of raiseboring for the ore passes and silos.

Following the board's approval of the change of scope and RBPlat's revised concentrator strategy, the project's overall budget was reduced from R11 801-million to R11 014-million, a saving of R787-million. The total capital expenditure for 2013 was R681-million and the cumulative project expenditure by year-end was R2.511-billion against an earned value of R2.705-million. This reflects a saving of R194-million on the work completed to date. Total capital commitments increased to R3.149-billion at year-end.

Further, RBPlat has made a strategic decision to upgrade the existing BRPM concentrator to accommodate the Styldrift ore in favour of

building a standalone concentrator at Styldrift. This upgrade will result in a R750-million reduction in capital for RBPlat.

The upgrade will also require a significantly reduced stockpile of about 300 000 t of high-grade Merensky ore, compared with 900 000 t of high-grade Merensky ore required for the standalone concentrator.

Key Contracts and Suppliers

WorleyParsons (main project engineering, procurement and construction management contractor); Anglo technical division (mine shaft design); Mining & Engineering Technical Services (Mets – services shaft headgears); Shaft Sinkers (main and services shafts and associated works); Louwill Engineering (main and services shafts' headgears and winder house structural manufacturing and erection); FLSmidth Minerals (main shaft personnel and material winder mechanical portion); Actom (formerly Alstom Industry – main shaft personnel and material winder electrical portion); Coilmech (service winder mechanical and electrical portions); Stefanutti Stocks Civils Wramatshe joint venture (civils Phase 2 contract – main bulk surface civils); Sarens (cranes); Sandvik Mining (underground production trackless equipment).

On Budget and on Time?

Overall, the project remains on schedule to commence with stoping ramp-up in July 2015, reaching steady state in June 2018.

Contact Details for Project Information

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Sandvik Mining business development manager, EMEA, **Bjorn Gohre**, tel +27 11 570 9676.

WESIZWE PLATINUM'S BAKUBUNG PLATINUM GROUP METALS PROJECT

Name and Location

Bakubung platinum group metals (PGMs) mine project, North West, South Africa.

Client

JSE-listed Wesizwe Platinum.

Project Description

The Bakubung platinum mine project, formerly known as the Frischgewaagd-Ledig project, is located in the western limb of the Bushveld Igneous Complex, north of the City of Rustenburg, in the North West.

The project entails the construction of a PGM mine on Wesizwe Platinum's core assets.

The project will consist of an underground mine and takes into account the establishment of all surface infrastructure, servitudes for bulk power and water supply, the sinking and equipping of ventilation and main shafts, the associated underground infrastructure, the ancillary excavations and the access development to establish a footprint for full production.

The proposed access to the orebody will be through the sinking of an independent twin vertical-shaft system. This will comprise a 1 000-m-deep, 8.5-m-diameter downcast men-and-materials and hoisting shaft, as well as a 930-m-deep upcast ventilation shaft, 7.5 m in diameter. The shafts will be strategically positioned to provide the most effective access to both reef horizons.

The mine is specifically designed for optimum flexibility in terms of mining method (conventional, mechanised or hybrid) and allows for fast production build-up to enhance the project's shareholder value.

The project has an estimated life-of-mine of 35 years at a production rate of 230 000 t/m, producing an average of 350 000 oz/y of platinum-group elements during steady-state production. Initially, 180 000 t/m will be mined from the Merensky reef, with the balance coming from the secondary upper group two (UG2) ore. When the Merensky reef is depleted, between 10 and 15 years after the start of production, the full 230 000 t capacity will be generated from UG2 ore.

The mine will permanently employ a minimum of 3 200 workers when in full production, of whom 120 would work at the process plant and 1 800 underground.

Value

The capital cost estimate for the project is forecast at R7.9-billion and, with expected inflation and cost escalation, is expected to rise to R12-billion.

Duration

Main commissioning is scheduled for 2018 and full production is expected in 2023.

Latest Developments

Wesizwe plans to table the results of an optimisation study for board approval, which could enable its Bakubung mine to ramp up to full production two years earlier than scheduled.

The study, currently under way, will result in the Rustenburg-based operations achieving a maximum output of 350 000 oz/y of platinum by 2021, instead of the currently expected third quarter of 2023, according to Bakubung GM **Eddie Mohlabi**.

The optimisation plan, if adopted, could allow for start-up as early as 2017, although Wesizwe corporate affairs and investor relations executive **Hamlet Morule** has declined to provide a more definitive timeline.

The platinum miner has also reviewed the original processing plant feasibility study.

Meanwhile, Wesizwe is finalising the terms and conditions of a \$650-million loan facility that was approved by the China Development Bank in January. The miner has also secured two further \$100-million loan facilities.

This comes as Wesizwe announced in October that it had decided not to fund its 26% initial cash call share of the Western Bushveld joint venture Project 1 with TSX- and NYSE-listed Platinum Group Metals, as it planned to inject all funds into Bakubung.

Key Contracts and Suppliers

TWP Projects (feasibility study and current engineering, procurement and construction management contract); Scribante Construction (earthworks and civil work Phase 1); Benco Engineering (blasting); Blast Management & Consulting (blast monitoring); Eskom (power supply); Liviero (civil earthworks and concrete) and Aveng Grinaker-LTA Mining (shaft-sinking contract).

On Budget and on Time?

The development of Bakubung was currently on schedule and within budget, with first production scheduled for the first quarter of 2018.

Contact Details for Project Information

Wesizwe Platinum executive: corporate affairs and investor relations **Hamlet Morule**, tel +27 11 994 4600, fax +27 11 944 4601 or email hamlet@wesizwe.com.

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TWP Projects, tel +27 11 218 3000, fax +27 11 218 3100 or email twpinfo@twp.co.za; or MD **Digby Glover**, email dglover@twp.co.za.

Aveng Grinaker-LTA, +27 11 578 6000 or fax +27 11 578 6161.

Uranium

The continued shuttering of Japan's reactor fleet, low prices and a supply overhang continue to weigh on the uranium market. However, the positive, long-term fundamentals, mainly driven by China bringing new reactors on stream and the prospect of Japan restarting nuclear reactors that have been shut down since the earthquake and tsunami, in Fukushima, in March 2011, remain robust and will start to be felt in the next few years, says Cameco VP, marketing strategy and administration Tim Gabruch.

Positive medium- to long-term factors, include the conclusion of the Megatons to Megawatts Programme with Russia at end-2013. Further,

about 15 reactors are expected to be connected to the grid in 2014, with the growth being led by China. There are also 70 reactors currently under construction. If the start-ups occur as planned, then 50 of these units will be online in the next three years. "This is real, tangible growth at a level that we haven't seen for decades," says Gabruch.

Swakop Uranium's Husab uranium project will be well poised to take advantage of the market, as the project, in the Erongo region of central-west Namibia, will be the world's second-largest uranium mine once in full production. Mining operations are expected to start in the first quarter of 2014, as scheduled.



SWAKOP URANIUM'S HUSAB URANIUM PROJECT

Name and Location

Husab uranium project, near Swakopmund, Namibia.

Client

Swakop Uranium is majority owned by China General Nuclear Power Corporation (CGNPC), following purchase of former owner Extract Resources in 2012. The Husab project is being developed by CGNPC subsidiary Swakop Uranium, in which Namibian State-owned mining company Epangelo acquired a 10% stake in November 2012.

Project Description

The Husab project, located in the Erongo region of central-west Namibia, currently ranks as the third-largest global uranium-only deposit and is comfortably the largest uranium deposit in Namibia. It has uranium reserves of at least 280-million tonnes, grading at 518 parts per million for 320-million pounds of contained uranium oxide (U_3O_8).

A definitive feasibility study, prepared on the basis of a low-risk conventional openpit mine over Zones 1 and 2 and delivered to the market in April 2011, has indicated that about 15-million tonnes of ore a year could be delivered to a conventional agitated acid-leach plant to produce about 15-million pounds of U_3O_8 equivalent a year. The current plan is to mine from two separate pits to maintain the 15-million-pound-a-year output over an estimated life-of-mine of 20 years.

Cementing its place as one of the largest resource drilling projects worldwide, Swakop Uranium has completed almost 800 000 m of combined reverse-circulation and diamond core drilling from April 2006, when the drilling programme started.

Value

Capital costs for the project are estimated at R20-billion, including the initial mine fleet, process plant and supporting infrastructure.

Duration

The Husab mine should take about three years to build, which means that commissioning activities will start towards the end of 2015.

Latest Developments

Mining operations on Swakop Uranium's Husab site, which will be the world's second-largest uranium mine once in full production, will start in the first quarter of 2014, as scheduled. The plan is to ensure that a run-of-mine stockpile will be ready for processing on completion of construction of the processing plant.

The Husab project has secured buffer storages for water, so that the project can continue uninterrupted until the permanent water line is constructed and comes on stream.

Owing to significant project ramp-up and increased demand for construction water in the year ahead, the project team used the Christmas break to mitigate the risk by filling newly constructed ponds. The new ponds have a joint capacity of 52 000 m³, roughly ten times that of the temporary pond.

Electricity from the NamPower grid was connected on February 3, through a 17 MVA mobile substation. The Husab mine site will have up to 50 MVA by the end of the year through a permanent substation.

Construction of the permanent 21.6-km-long access road and the 60-m-long bridge over the Khan river is progressing well and the completion date is set for early April 2014.

Swakop Uranium has also confirmed plans to build a 500 000 t sulphuric acid plant at the mine. Sulphuric acid is a key chemical used to recover uranium in an orebody.

Construction of the sulphuric acid plant will start in the second quarter

of 2014. The Husab mine is expected to use all the sulphuric acid produced at the envisaged plant. Additional acid, if needed, will be sourced locally or imported.

Key Contracts and Suppliers

Husab Project Joint Venture, comprising Amec and Tenova Bateman (engineering, procurement and construction management contract); Gibb (bridge and road design); Basil Read Namibia (permanent access road); Wilson Bayley Homes-Ovcon, or WBHO (bulk earthworks for entire plant); Komatsu (haul trucks and support fleet); Barloworld Namibia (road shovels, hydraulic mining shovels and drills); Concor (contractors' camp earthworks and infrastructure); Botes & Kennedy Manyano (temporary water pipeline and temporary access road); Conco (power transformers, Husab substations and mobile pit substations); Woker Freight (clearing, transport and storage of tyres), Lithon Project Consultants (construction supervision and engineering services for permanent access road), Access Laboratory (site laboratory, blasting and excavations); Stefanutti Stocks (bridge piling works) and Synnergistics part of the SLR group (detailed design and construction supervision of the tailings storage facility, ongoing ground and surface water monitoring, and environmental system implementation, which includes environmental site officer support).

On Budget and on Time?

Yes.

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