Diversifying out of diamonds

The southern-African country is planning to exploit its base-metal, coal and uranium resources

BY ROGER MURRAY

FAST FACTS	
Capital:	Gaborone
Population:	2 million
Currency:	Pula
Government:	Unitary republic
GDP growth:	4.1% (2010 forecast)

PRESIDENT Ian Seretse Khama's ruling Botswana Democratic Party (BDP) won re-election with a slightly bigger majority in the October 2009 elections.

This was due in part to a divided opposition, and despite the negative impact of the global recession and sharply-lower diamond production. These factors caused higher unemployment, curtailed government revenue and pushed the current account into deficit.

Although deficit budgets will continue until the 2012-2013 fiscal year, previous conservative fiscal management meant that although foreign reserves declined, government debt has remained manageable. There is no threat of a sovereign-debt crisis, while the banking system has remained adequately-capitalised.

Despite the financial pressures on its budget, the government contributed US$150 million in additional equity capital to De Beers under a refinancing arrangement with its shareholders at the start of 2010 (Botswana holds a 15% equity interest).

Real GDP fell by 8% in 2009, but the economy is expected to resume positive growth of around 4% this year. This is attributed to a recovery in diamond output, further development of downstream diamond-related activities (through the Gaborone diamond 'hub') and the development of new copper, uranium and coal mines.

DIAMONDS BACK IN DEMAND

Output by Debswana, the government-De Beers joint venture that produces all Botswana's rough diamonds, contracted by 46% to 17.7Mct in 2009 due to a shut-down in operations for much of the year after the slump at the end of 2008 in rough diamond sales.

However, improved demand and prices enabled Debswana to lift production by 164% to 10.3Mct in the first half of this year. On an annualised basis this would equate to 20.6Mct for the 2010 calendar year, although still over a third below the 32.3Mct produced in 2008 when Botswana was the world's largest producer (by both value and volume).

Botswana's diamond production is not expected to recover to its previous levels until at least 2012, and even this assumes a continued recovery in global demand.

Debswana has several multi-million dollar projects underway to prolong the life of its Jwaneng and Orapa mines beyond 2020. For example, work has now commenced on Cut-8, the major expansion project at Jwaneng, and Debswana is also proceeding with the Orapa resource extension project (OREP) to investigate the feasibility of mining deeper ore.

In June 2010, Debswana confirmed it would proceed with the Modular Tailings Treatment Plant (MTTP) at Jwaneng under a contract with Firestone Diamonds plc, which has also begun commercial production at its BK11 kimberlite near Orapa. Construction is due to start in the first half of 2011, with full production scheduled for 2012. Firestone intends to finance the project through a special-purpose vehicle that will arrange debt finance against the Debswana contract.

Meanwhile, BK11 is expected to produce around 1Mct over a ten-year life at an average grade of 8.5ct/100t and a US$155/ct estimated average value. Under phase one, run-of-mine capacity is 650,000t/y rising to 1.5Mt/y under phase two, which is on target for completion in the September-quarter. The diamonds will be sold by open tender in Botswana, but the government has also approved tendering outside the country until December 2013.

Firestone intends to use cash flow from BK11 to advance its other Botswana diamond prospects. These include eight diamondiferous kimberlites in the Orapa area, of which the BK16 project is the most advanced. The company also intends to resume exploration and evaluation work at the Tsabong kimberlite field in the southwest, either through a joint venture or independently. Tsabong is one of the world's largest kimberlite fields, with 20 of the 84 known kimberlites, proven to contain diamonds.

The long-planned development of a mine at the AK6 kimberlite has moved ahead. Commissioning is due to start in late 2011 following a revised feasibility study, which was completed in June. AK6 is being developed by the Boteti joint venture between Lucara Diamond Corp (part of the Lundin Group) with a 60% interest and African Diamonds with 40%.

Initial throughput is planned at 2.5Mt/y, rising to 4Mt/y after four years, with an 11-year mine life. The government has now agreed to diamond sales by an open tender process and/or negotiated exclusivity contracts.

AK6's cost has increased sharply since the original feasibility work, with a near-doubling in first-phase capital investment to US$120 million and an 18% increase in operating cost to US$17.20/t of ore treated, up from US$14.40/t previously.

The higher capital cost reflects a 25% increase in throughput capacity, foreign exchange movements and escalation, along with scope changes (mainly a pebble crushing circuit). Operating costs have been boosted by the factoring in of higher electricity-supply charges and the pula's appreciation against the US dollar.

BASE AND PRECIOUS METALS

Production of copper-nickel matte from BLC Ltd's Selebi-Phikwe mine, along with soda ash and salt from Botash's Sua Pan facility were mainly higher in 2009. Matte production rose by 4% to 54,000t, with contained nickel and copper values slightly higher.

Tati Nickel Mining Co (owned 85% by OAO Norilsk Nickel) produced 10.7Mt ore in 2009 from the Phoenix

Firestone's BK11 mine is expected to produce 1Mct

De Beers' Jwaneng mine

Photo: Visual Media

open-pit mine near to Selebi-Phikwe. A dense media separation concentrator commissioned in 2008 processed 6.9Mt for 363,000t of concentrate averaging 5.4% Ni. Saleable production was 17,401t nickel concentrate, 13,352t copper concentrate, 100oz of palladium and 17oz platinum. Most concentrates are shipped to Norilsk's Harjavalta refinery.

There has been a strong resurgence in base-metals exploration since the hiatus in some projects caused by several junior firms' financing difficulties during the global recession.

African Copper plc recommissioned the Mowana copper mine in August 2009 after recapitalisation by Zambia's ZCI Ltd, which acquired an 82% equity interest in mid-2009. The company anticipates additional financing will be required by end-March 2011.

Mowana produced 8,800t of concentrate grading an average 25.1% Cu for 2,199t of contained copper concentrate, to mid-June 2010. The mine is being ramped up to full capacity through plant improvements and redesigns including a shift from dry to wet tailings and the installation of a dense-media separation plant (to be commissioned in the first half of 2011).

Commercial mining of the Thakadu copper-silver deposit to the south is expected to start later this year, with a mining licence expected to be approved shortly. The current Thakadu mineral resource is 4.7Mt grading 1.7% Cu and 3.6Mt grading 16g/t Ag.

Discovery Metals Ltd received government approval in June for the final environmental and social impact assessment for its Boseto copper project in northwestern Botswana. A feasibility study is due this August, with commissioning scheduled for December 2011.

Boseto will be a 15-year open-pit mining operation with a 3Mt/y concentrator, for production of 38,000t/y of copper and 1.2Moz/y of silver. Capital costs are currently estimated at US$85 million and a five-year off-take agreement for all Boseto concentrate has been signed with Transmine.

Discovery is also evaluating underground mining at Boseto, after a scoping study confirmed the viability of below surface mining of the Zeta deposit at a very low incremental capital cost. A prefeasibility study is due for completion in September.

Also in the northwest, Hana Mining Ltd aims to complete a preliminary economic assessment by end-2010 at its Ghanzi sediment-hosted copper-silver project. An inferred resource estimate from April this year estimates 177Mt containing 1.6Mt of copper and 62Moz of silver. Certain areas exhibit higher-grade mineralisation, which Hana believes provide an opportunity to locate starter pits and mine initial tonnages at higher than average grades.

In the same area, Mount Burgess Mining NL is preparing a revised scoping study for the Kihabe-Nxuu lead-zinc-silver deposit. The shallow deposits lie along part of the 3,000km^2 Proterozoic Belt spanning the Botswana/Namibia border over which Mount Burgess has 100% exploration rights. The current resource is estimated at 25.3Mt grading 2.98% Zn/Pb, of which 11.4Mt grading 2.9% Zn/Pb is indicated (Kihabe only) and 13.9Mt grading 3.1% Zn/Pb is inferred.

The previous May 2009 study proposed a 2.5Mt/y throughput and ten-year mine life at a US$217 million capital cost and US$20/t operating cost. The update will factor in higher metal prices, increased metal-recovery rates, the incorporation of acid leaching of oxidised ore in to the process flow sheet, on-site electro-winning of zinc metal and a smaller concentration plant.

Botswana Metals Ltd was spun-off in early 2010 by A-Cap Resources Ltd to evaluate known base and precious metal prospects within A-Cap's 2,800km^2 licence area in north-eastern Botswana. The area is regarded as containing prospective copper-nickel deposits.

BOTSWANA MINERAL PRODUCTION (2009)

Mineral	Production
Diamonds (Mct)	17.7
Cu-Ni matte (t)	54,000
Nickel (contained, t)	30,000
Copper (contained, t)	24,000
Gold (oz)	52,276
Coal (t)	738,000

EXPORTS FALL

Mineral exports fell 33% by value to US$2.8 billion in 2009 but they still accounted for 84% of total exports.

The principle exports were diamonds and copper-nickel matte, albeit registering falls of 31% and 42%, respectively.

But diamond and copper-nickel exports staged a recovery in the March-quarter, almost trebling the year-on-year valuation to US$955 million, with diamond exports up by 250% and copper-nickel exports up 33%.


De Beers is trying to prolong the life of Jwaneng

Photo: Visual Media

POWER PLANS

Only a small proportion of Botswana's estimated 2,200Mt of bituminous coal resources is currently being mined. However production by the Debswana-owned Morupule Colliery is set to expand to supply an enlarged power-generating capacity (the Morupule power station's capacity is being raised from 120MW to 720MW through the 600MW Morupule B project for which the World Bank has lent US$136 million).

CIC Energy Corp has been obliged to suspend further development of its US$3 billion 1,320MW Mmamabula coal-to-power project (called the Mmamabula Energy Project) owing to South African regulatory delays.

The government of South Africa will not be able to sign a Mmamabula power purchase agreement until its second Integrated Resource Plan (a 20-year energy road-map) has been approved by South Africa's Department of Energy. Instead, in early 2010, CIC Energy opted to advance development of a smaller 300MW Mookane domestic power project.

Mookane will provide power exclusively for the domestic market, whereas Mmamabula is targeted primarily at South Africa's electricity needs.

GCL Projects, a subsidiary of China's Golden Concord Holdings Ltd, will become Mookane's majority equity investor under a March 2010 memorandum of understanding, and will also be the construction contractor and operator of the power station and mine. CIC Energy plans to retain a 30% equity stake and negotiations are also underway for additional investors.

The mine supplying Mookane will be on a different site than the 6Mt capacity Mmamabula colliery, with the Mookane power station to be located adjacent to, but separate from, the planned Mmamabula station.

CIC Energy has extended the engineering, procurement and construction contract for Mmamabula originally signed with Shanghai Electric Group Co in March 2009, for beyond the period expected for approval of South Africa's IRP2010 and at the same fixed price.

The company is also continuing to consider a coal export project and a coal-to-hydrocarbons project.

URANIUM ON THE HORIZON

Botswana is on track to become a uranium producer by 2012-2013, when a mine at A-Cap Resources' Letlhakane project in the northeast opens.

Hong Kong-based China Growth Minerals Ltd completed its purchase of Polo Resources Ltd's shareholding in A-Cap in March 2010, raising its equity interest to 16% and making it A-Cap's biggest shareholder.

A feasibility study is underway at the Letlhakane project, based initially on a 2008 scoping study that proposed a mine producing 7Mt/y of ore and 2.2Mlb/y of uranium at an estimated US$170 million capital cost and US$33/lb operating cost. The Lycopodium study is focusing on metallurgical treatment routes, including recovery optimisations and beneficiation techniques aimed at reducing operating costs.

Impact Minerals Ltd (in which China Growth also holds a 10% interest) has started an 18,000m drilling programme on two yellowcake prospects to the south and one northwest of Letlhakane. This comprises 2,000m of infill drilling at Lekobolo, 6,000m of reverse-circulation drilling at Kodibeleng North, and 10,000m of aircore drilling at Sua.

Initial drilling results for Lekobolo confirmed a large mineralised area less than 25m deep, with the best downhole gamma probe results being 12m at 143ppm eU_3O_8 and 16m at 119ppm.

Meanwhile, Australia's Bannerman Resources Ltd is conducting a RadonX survey over its Dukwe, Serule North and Serule South licences in the Foley/Sua Pan areas later this year in preparation for initial drilling.