Unlocking the iron and steel potential of Mozambique

AIM-listed Baobab Resources is developing mineral resources in Mozambique, with its flagship project being the Tete iron ore deposit. Ben James, MD of Baobab resources, speaks to Hans Alink about unlocking the iron and steel potential of that country.

Baobab’s main focus is to develop iron ore resources in the sub-Saharan Africa region and establish a significant pig iron operation. “Pig Iron is used alongside scrap iron in electric arc furnaces to produce steel products. The market size is significant (70 Mtpa and 350 Mtpa for pig and scrap respectively) and will continue to grow as the Chinese scrap market matures, and the quality and quantity of scrap elsewhere in the world decreases. Baobab believes that it will become one of the lowest cost producers of pig iron globally, with healthy production margins allowing it to compete at scrap prices if push comes to shove.

“The resource inventory at the Tete project is sufficient to underpin the production of up to 5 Mtpa pig iron over a 25-year mine life. At production rates of 3 Mtpa or more, the Tete pig iron project wouldn’t just be world class, it would be the world’s single largest producer.”

What makes this project so exciting is that it enjoys a unique geographical and geological setting. Baobab’s Tete project has large deposits of iron ore immediately adjacent to some of the largest undeveloped coal deposits left on the planet. The Tete Province and the Zambezi River are also home to the Cahora Bassa Dam, Southern Africa’s largest hydroelectric scheme (plans are in place to significantly increase production in the coming years) and feasibility studies are being completed on at least three thermal power plants in the region.

It is the project’s strategic access to the requisite steel making commodities of coal, power and water that differentiates Baobab’s project from any other in Africa, if not globally. “I always ask people ‘why are steel mills almost invariably on the coast?’ and the answer is that you have to bring together four critical commodities: iron ore, coal, power and water. In Tete, we are at the confluence of these commodities and this presents a unique opportunity to add a massive amount of value at the mine mouth through smelting a pig iron product.”

The coalfields are being brought into production by some of the largest international mining companies, including Rio Tinto, Vale and Anglo American. Alongside the mining giants are some of the world’s tier 1 steel producers – Jindal Steel & Power and Tata out of India – and Nippon Steel and POSCO out of Asia are also developing coal deposits in the area. “Baobab is a small company with a big project, which will present challenges going forward. The major players already operating in Mozambique present a stellar cast of potential strategic partners for Baobab and the Tete project.

“The company is also slipstreaming behind the majors as they refurbish and expand the rail corridors to the coast and the port.

Baobab at a glance

- Baobab Resources listed on AIM in 2007 and wholly owns Mozambique company Capitol Resources Ltd.
- Portfolio of five green- to brownfields projects boasting a range of commodities, including:
  - Tete: pig iron/vanadium/titanium
  - Muande JV: iron/phosphate – earning in to North River Resources tenure
  - Mundonguara: copper/gold/nickel
  - Changara: Broken Hill type base metals & manganese
  - Sanangoe&SengaSenga: base & precious metals
- Baobab owns 85% of the Tete project since bringing in International Finance Corporation (IFC), a member of the World Bank group, in 2008/2009. IFC now has a 15% contributing interest in the project and is the company’s second largest shareholder.
facilities. The government is also on-side and has maintained a firm position on equitable access for third parties on rail and port infrastructure. Once at the coast, we are strategically located on Africa’s eastern seaboard to access the growth markets in Asia, India and the Middle East,” says James.

“This is not just another magnetite project, this is a project where we can beneficiate dramatically through our unique access to coal and power, and add a huge amount of value to our product right at the mine mouth. Being explorers and miners and not steel producers, the company is comfortable taking the project as far as pig iron. However, the ultimate value-add would be complete vertical integration to steel production that could be sold domestically and regionally to meet Southern Africa’s increasing appetite for construction steel. A strategic alliance with any one of our steel-focused neighbours could convert this potential into reality.”

Probably one of the biggest highlights of the current Baobab pre-feasibility work is the cost of production. With a massive resource of roughly half a billion tonnes (expected to grow to about 650 Mt by year end), which underpins a mine life of more than 125 years at a 1 Mtpa or 25 to 30 years at 5 Mtpa, everything over 3 Mtpa of pig iron production would make Baobab the world’s largest pig iron producer.

The scoping study, which was completed last year, indicates that Baobab’s cost of production FOB would be in the order of US$180 (R1 549.57) to US$200/t, which puts them at less than half the cost of the cost of production of the Brazilians, who are the world’s largest pig iron producers. This may make Baobab the world’s lowest cost producer of pig iron and would give the company a massive competitive advantage as they will be able to sell their product across the entire pig iron market, including the domestic Chinese market.

Looking at the timelines for construction, James says Baobab is now in the closing

**BELOW** Project geologist Pillani Mangezi with drill core containing massive iron mineralisation

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For explosives, think BME.
We will have the final results of the pre-feasibility study by next year’s Mining Indaba, i.e. Jan/Feb 2013, and we will be launching our definitive feasibility study thereafter, which will take us another 12 to 18 months. Construction of this project will take around two years, followed by about six months of commissioning during which we will ramp up to full production by 2016. That is our timeline we are aiming for, which fits in well with the logistics timelines of the development of the Beira corridor. If you produce a higher-value product mitigates competing for port and rail access.

PIG IRON MARKET

COMMODITY OVERVIEW
• Pig iron is a raw material and an intermediate product of the smelting of iron ore.
• Pig iron is used in electric arc furnaces (EAF) alongside scrap iron to produce crude and finished steel products.
• Global consumption:
  – pig iron: ±70 Mtpa (including domestic China)
  – scrap iron: ±350 Mtpa (2010)

STRONG MARKET FUNDAMENTALS
• Fundamentals are driven by:
  – the industrialisation of BRIC countries and sub-Saharan Africa – appetite for steel products
  – declining quality and quantity of scrap vs growing number of EAFs.

TETE PIG IRON
• There is a unique confluence of iron making commodities (iron ore, coal, power and water).
• The current JORC Resource inventory underpins a 1 to 5 Mtpa pig iron operation.
• The scoping study indicates a first quartile cost of production enabling the Tete product to compete across the broader global pig iron market, including the Chinese market, as well as competing within the significantly larger scrap iron space.

This range of fixed and handheld sensors was developed for the mining industry to meet specific requirements. The Smart Sensor is a fixed unit suitable for monitoring various gases and for fire detection in specific locations. The Sentient handheld instrument is a sophisticated and low maintenance instrument able to accommodate up to three “plug and play” sensors, typically CH₄, CO and O₂.
consider that we drilled the first hole ever in this area back in 2009, this is a rapid development trajectory. Seven years is not bad going from discovery to full production for a project of this magnitude.”

At Changara, Baobab had a joint venture (JV) with Ferrex, which was ended amicably earlier this year. The company is developing five projects (see panel) at the moment. As Changara ranks fourth, it is low on the priority list. It is very much a greenfields project, which the company was looking to develop with Ferrex for base metals and manganese. “We did a lot of good work with Ferrex on Changara, which mostly involved geochemistry. Earlier this year, Ferrex was able to get licences granted in Togo, which overlay significant manganese resources that were much more interesting for them than our Changara project. They opted to focus their efforts there rather than Mozambique, so we ended the JV and parted on very amicable terms. We are now looking for a new JV partner to further develop the potential at Changara. This requires a lot of work, which more than anything else just means bodies on the ground.”

Apart from Baobab’s five operations, with Tete being the flagship asset, the company also has a copper/gold/nickel deposit in the Manica area, right next door to Pan African Resources’ Manica project, which recently got shuffled into an Australian company called Terra Nova.

Apart from some other greenfield interests, the company has the Monte Muande JV project in Tete, immediately adjacent to its Tete project. Monte Muande is held by North River Resources, with Baobab so far having earned a 60% interest in the project. At Monte Muande, Baobab is looking at a range of commodities, principally magnetite, phosphate (for the fertiliser market) and calcium carbonate (for both the thermal power and possibly the cement industry), and it is also checking a couple of very interesting copper anomalies in that area.

“Next year, as we go through the definitive feasibility study (DFS) on our Tete project, we will also be developing discoveries and resources on our Monte Muande project. DFSS do not tend to generate significant news flow and it would be useful to maintain momentum in the market by the regular announcement of results at our other assets, particularly Muande,” James concludes. 35